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WITH HER: HEAL, EMPOWER, RESPECT- EVERY STEP OF THE WAY

Theme:

Endometriosis & Adenomyosis: Two Faces of the Same Disease?



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From the President's Desk



Dear Colleagues and Esteemed Members

It is my pleasure to present this special issue of the AOGD Bulletin dedicated to Endometriosis and Adenomyosis— challenging gynecological conditions that continue to impact women's health, fertility, and quality of life. Despite growing awareness and significant advances in diagnostics and therapeutics, delays in diagnosis and management remain major challenges, warranting continued efforts to resolve the contentious issues.

This issue brings together contemporary evidence and expert perspectives across the spectrum of care. From the evolving role of ultrasound and MRI in early diagnosis to recent advances in medical management, fertility-enhancing surgery for endometriosis and adenomyosis, pain management, fertility preservation, and the psychological impact, the articles provide practical insights for everyday clinical practice.

As clinicians, our responsibility extends beyond treating disease; we must strive for early diagnosis, evidence-based management, multidisciplinary care, and compassionate counselling that addresses the physical, reproductive, and emotional needs of our patients. Equally important is our commitment to research, innovation, and continuous learning to improve outcomes for women affected by these complex disorders.

The editorial team with their valuable contributions deserve a special appreciation for bringing together this comprehensive issue. I am confident that this bulletin will serve as a useful resource for clinicians, academicians, trainees, and researchers at the present time.

Let us continue to advance knowledge, strengthen collaboration, and offer hope to every woman living with these conditions.

Dr Neena Malhotra
Professor and Head, Department of Obstetrics and Gynaecology
AIIMS New Delhi

From the Secretarial Desk



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Dear AOGD Members,

The enthusiastic response and continued encouragement received for our previous bulletin have been truly inspiring and have reinforced our commitment to advancing evidence-based practice and academic excellence in women's healthcare. Continuing our theme, "With HER: Heal, Empower, Respect – Every Step of the Way," we are pleased to present this issue of the AOGD Bulletin, dedicated to "Endometriosis and Adenomyosis: From Awareness to Advanced Care."

Endometriosis and adenomyosis are among the most challenging benign gynaecological disorders, significantly affecting the quality of life, fertility, and long-term health of women. Despite their high prevalence, delayed diagnosis and evolving management strategies continue to pose clinical challenges. This issue brings together contemporary evidence and expert perspectives to support clinicians in delivering timely, comprehensive, and patient-centred care.

The bulletin features a thoughtfully curated collection of articles covering the evolving role of ultrasound and MRI in diagnosis, recent advances in medical management, fertility preservation, infertility management, surgical approaches, multidisciplinary care, and the integration of artificial intelligence in the diagnosis and management of endometriosis. Special emphasis has also been placed on adolescent endometriosis, fertility-related concerns, recurrent disease, and emerging concepts that are shaping the future of endometriosis care. Together, these articles aim to provide practical guidance while bridging the gap between current evidence and day-to-day clinical practice.

I extend my heartfelt appreciation to our editorial team for their dedication in conceptualizing and compiling this comprehensive issue, and to all our esteemed contributors for sharing their knowledge, expertise, and valuable clinical experience. Their collective efforts continue to enrich our academic initiatives and strengthen evidence-based women's healthcare.

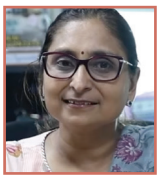
We look forward to your continued support, valuable feedback, and active participation in future AOGD academic endeavours as we continue our shared mission of serving HER with compassion, innovation, and excellence.

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From the Editor's Desk



Dr Reeta Mahey



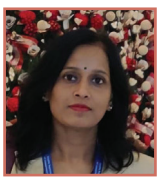
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Dear Colleagues,

It is with great pleasure that we present this issue of the AOGD Bulletin, dedicated to the theme "Endometriosis and Adenomyosis: Two Faces of the Same Disease." Once regarded as distinct clinical entities, growing evidence now suggests that endometriosis and adenomyosis share common pathogenic mechanisms, overlapping clinical presentations, and frequently coexist in the same patient. Together, they represent a spectrum of chronic estrogen-dependent disorders that significantly impact women's health, fertility, and quality of life.

Despite remarkable advances in imaging, molecular biology, and minimally invasive surgery, these conditions continue to be underdiagnosed, often resulting in years of pain, infertility, and reduced quality of life before an accurate diagnosis is made. With increasing recognition of their shared pathophysiology, the focus has shifted from treating isolated lesions to adopting a comprehensive, individualized, and multidisciplinary approach that addresses pain, fertility preservation, reproductive outcomes, and long-term well-being.

This issue brings together expert perspectives on recent advances in diagnosis, imaging, medical and surgical management, fertility considerations, case based management and emerging research that is reshaping our understanding of these complex disorders. Updates on the latest ESHRE recommendations and emerging therapies such as Relugolix, are expressed through a compilation of case discussions. We have included new sections like patient information sheets and Her story, giving an overview of patients experience of these pathologies. We hope these articles provide practical insights that can be translated into improved patient care and stimulate further research in this evolving field.

On behalf of the Editorial Team, we sincerely thank all the contributors, and members of the AOGD family whose dedication has made this issue possible. We hope this edition serves as a valuable resource for clinicians, academicians, and trainees, while inspiring continued efforts toward earlier diagnosis, evidence-based management, and better outcomes for women living with endometriosis and adenomyosis.

Happy Reading!

The Editorial Team

Seeing Beyond Symptoms: The Evolving Role of Ultrasound and MRI in Endometriosis and Adenomyosis

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INTRODUCTION

Endometriosis and adenomyosis are chronic estrogen-dependent gynecological disorders that affect millions of premenopausal women worldwide and are the leading cause of chronic pelvic pain, dysmenorrhea, and infertility. Both disorders frequently coexist, sharing common clinical clinical manifestations and pathophysiological mechanisms. Clinical manifestations are often non specific and poorly correlated with disease severity, resulting in diagnostic delay that may extend over years.

Endometriosis is characterized by endometrial tissue (including endometrial glands & stroma) located outside of the uterine corpus, which causes inflammation and fibrosis. Chronic pelvic pain and infertility are the most common presentation of endometriosis. Whereas adenomyosis is characterized by presence of ectopic endometrial tissue within the myometrium. These ectopic endometrial glands incite spiral vessel angiogenesis and smooth muscle hyperplasia & hypertrophy, leading to junctional zone thickening & diffuse uterine enlargement. Commonly, patients with adenomyosis clinically present with menorrhagia and dysmenorrhea.

Historically, laparoscopic visualization with histopathological confirmation was considered the diagnostic gold standard. However, Imaging has revolutionized the diagnostic pathway by enabling early, non-invasive detection, precise characterization & extent of the disease. High resolution Transvaginal ultrasound (TVS) has emerged as the first line imaging modality owing to its accessibility, dynamic assessment capabilities, and excellent diagnostic performance. Magnetic resonance imaging (MRI) provides comprehensive disease mapping due to its superior soft-tissue resolution and multiplanar capabilities. It also provides invaluable information in deep infiltrating endometriosis (DIE) and complex pelvic disease. Recent advances, including standardized imaging protocols, the International Deep Endometriosis Analysis (IDEA) consensus, 3-D ultrasound, and artificial intelligence-assisted imaging have further enhanced diagnostic accuracy. The evolution of imaging from merely identifying ovarian endometriomas to comprehensive mapping of pelvic disease has significantly influenced clinical management. Presently, both ultrasound (USG) and MRI play central roles in diagnosis, surgical planning, fertility preservation, and treatment monitoring.

ULTRASOUND (USG): THE FIRST-LINE IMAGING MODALITY

High-resolution transvaginal ultrasound (TVS) has become the cornerstone of imaging evaluation because of its widely availability, radiation-free, low cost and provides good spatial resolution. Advancement in ultrasound probe technology and structured examination techniques have substantially improved diagnostic accuracy for both endometriosis and adenomyosis. 3-D USG improves visualization of junctional zone and uterine architecture, enhancing detection of subtle adenomyosis.

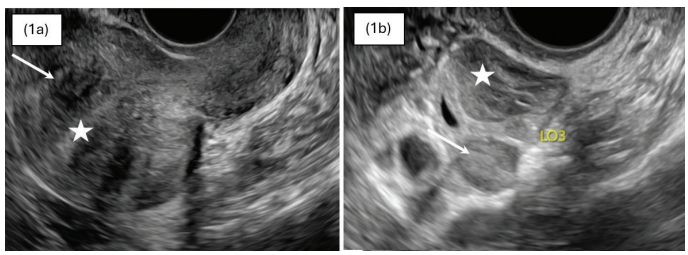


Figure 1: (a) Sagittal gray-scale transvaginal USG image shows diffuse adenomyosis with myometrial heterogeneity, fan shaped acoustic shadowing (arrow) giving "venetian blind appearance" and an irregular & interrupted border between the endometrium (star) and myometrium. (b) TVS image focusing left adnexa shows two cystic lesions, larger one shows lace-like reticular echoes characteristic of hemorrhagic cyst (star) and smaller cyst shows homogeneous echogenic contents suggestive of endometrioma (arrow).

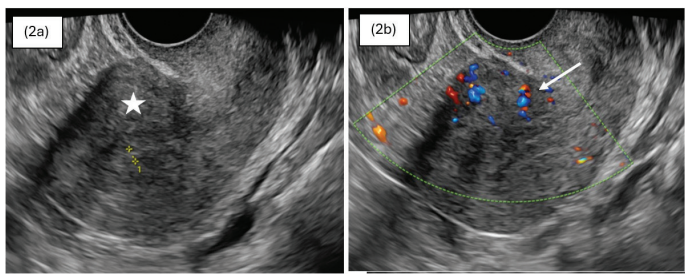


Figure 2: (a) Sagittal gray-scale TVS image shows focal adenomyosis in the anterior uterus with asymmetric thickening of anterior myometrium (star) and irregular ill-defined junctional zone. ET roughly measures ~ 3.7 mm (b) on color doppler, there is increased translesional vascularity with numerous tortuous penetrating vessels (arrow) throughout the region of focal adenomyosis.

Endometriosis is broadly classified into pelvic and extra-pelvic endometriosis. *Pelvic endometriosis* is further subclassified as ovarian endometriosis, peritoneal implants, and deep pelvic endometriosis (DPE).

Ovarian endometriomas are the most recognizable manifestation of endometriosis on USG. They typically appear as unilocular or multilocular cysts containing homogeneous low-level internal echoes, producing characteristic "ground-glass" appearance. Other sonographic signs include tiny echogenic wall foci, thickened walls, or fluid-fluid levels. Color doppler usually demonstrates minimal internal vascularity, differentiating it from neoplastic lesions.

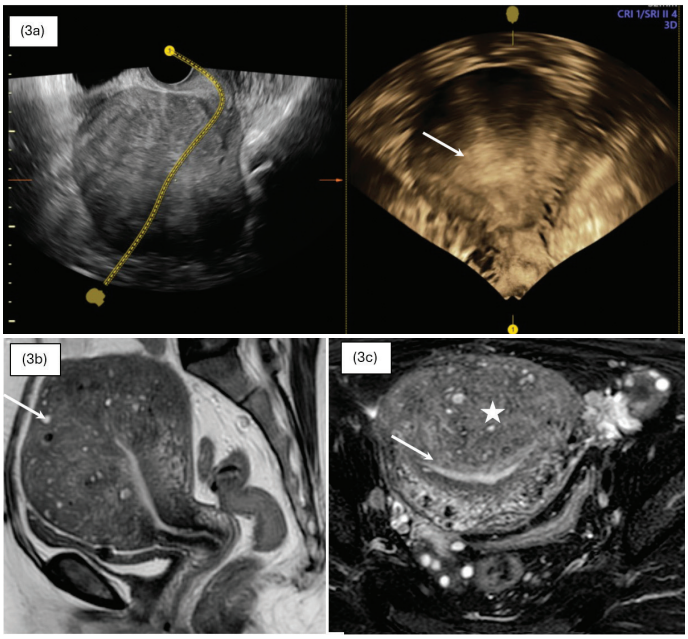


Figure 3: (a,b) Sagittal greyscale TVS image of the uterus with coronal 3D reconstruction USG image shows globular enlargement of uterus and widened & ill-defined junctional zone (arrow). (c) MRI of the same patient on sagittal T2 WI shows a diffusely enlarged uterus with thickening of junctional zone & low signal intensity of myometrium, innumerable hyperintense foci scattered throughout the myometrium (arrow). (d) On axial T2 fat sat WI, the ill-defined irregular junctional zone is appreciated well in anterior aspect (arrow) and asymmetric anterior myometrial thickening; showing low signal intensity with hyperintense foci within (star).

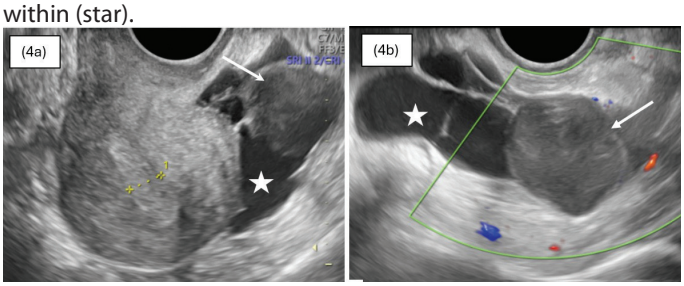


Figure 4: (a) Sagittal greyscale TVS image of the uterus shows normal endometrial thickening (ET ~ 8.5 mm) and junction zone with a round cystic lesion in left adnexa (arrow) & adjacent free fluid (star) in the pelvis. (b) TVS image focusing left adnexa shows a cystic lesion with homogeneous low-level echoes within and no vascularity on color doppler (arrow); characteristic of endometrioma and adjacent hydrosalpinx (star).

In 2016, The International Deep Endometriosis Analysis (IDEA) group statement is a consensus opinion on terms, definitions and measurements that may be used to describe the sonographic features of the different phenotypes of endometriosis. Four basic sonographic steps were proposed for examining women with clinical suspicion of deep infiltrating endometriosis (DIE) or known endometriosis. All steps should be performed, but they not be in the same order.

1st step - Routine evaluation of uterus & adnexa (+ sonographic signs of adenomyosis / presence or absence of endometriosis)

2nd step - Evaluation of transvaginal sonographic "soft markers" (i.e. site-specific tenderness and ovarian mobility)

3rd step - Assessment of status of POD using real time ultrasound based "sliding sign"

4th step - Assessment of DPE nodules in anterior and posterior compartment

The sliding sign has emerged as a useful sonographic maker. Failure of the anterior rectum to slide freely over the posterior cervix suggests pouch of Douglas obliteration and extensive deep pelvic adhesions (signifies as negative sliding sign). Site specific tenderness elicited during scanning further improves lesion localization and diagnostic confidence. Targeted assessment of anterior compartment (including bladder & uterovesical region) and posterior compartment (uterosacral ligament, posterior vaginal fornix, rectosigmoid & rectovaginal septum) is recommended.

Enzian classification has recently emerged as a comprehensive non-invasive and surgical description system for endometriosis. Enzian system documents lesion location and extent in the peritoneum (P), ovarian (O), tuno-ovarian adhesions (T), rectovaginal or retrocervical space (A), uterosacral ligaments/ cardinal ligaments / pelvic sidewalls (B), rectum (C), adenomyosis (FA), bladder (FB), intestinum (FI), ureters (FU), and other extragenital sites (F). It allows standardized reporting, improved preoperative planning, multidisciplinary communication, and meaningful comparison of outcomes across clinical studies.

ADENOMYOSIS

"Adeno" signifies migration of endometrial glands and stroma into the myometrium, whereas "myosis" represents smooth muscle hyperplasia & hypertrophy due to spiral vessels angiogenesis. Ultrasound findings can be divided into three categories, parallel to the histology of adenomyosis: (a) adeno - ectopic endometrial glands, (b) myosis - muscular hyperplasia or hypertrophy, and (c) increased vascularity. USG findings representing ectopic endometrial glands include echogenic striations/ nodules, myometrial cysts & cystic striations, whereas muscle hyperplasia is characterized by thickened inner myometrium, focal or diffuse myometrial thickening,

enlarged globular uterus & pencil-thin venetian blind shadowing. Raised myometrial vascularity is seen as penetrating vessels with increased vascularity on doppler ultrasound scan.

In 2015, The Morphological uterus sonographic assessment (MUSA) group has specified terminologies to be used in description of adenomyosis. However, it does not provide guidelines to classify morphological types or extent of adenomyosis. The direct features represent the ectopic endometrial tissue in the myometrium and include myometrial hyperechogenic rests, hyperechogenic sub-endometrial lines or buds and myometrial cysts. Indirect features represent the myometrial stromal reaction to the ectopic endometrial tissue and include globular shape, irregular/interrupted junctional zone, asymmetrical wall thickening, fan shaped shadowing behind the lesion and trans-lesional vascularity. Recognition of these features enables diagnosis even in early disease, facilitating timely hormonal therapy and fertility counselling.

Structured reporting systems based on IDEA and MUSA recommendations are improving communication among radiologists, gynecologists, reproductive specialists, and surgeons, leading to more consistent patient management.

MAGNETIC RESONANCE IMAGING (MRI): BEYOND LESION DETECTION

MRI complements ultrasound (USG) by providing excellent soft tissue contrast, multiplanar imaging, and a comprehensive overview of pelvic anatomy. It is useful when USG findings are inconclusive, when extensive disease is suspected, or when surgery is being planned. A dedicated MRI protocol includes high resolution T2 WI in multiple planes, T1 WI with & without fat suppression, and diffusion-weighted imaging (DWI).

Ovarian endometriomas appear hyperintense on T1 WI because of blood products and demonstrate classical T2 shading sign resulting from prepared cyclic hemorrhage. T2 dark spot sign is highly specific for chronic hemorrhagic content.

Deep pelvic lesions appear as irregular T2 hypointense fibrotic plaques containing punctate T1 hyperintense foci representing ectopic endometrial glands or hemorrhage. MRI accurately demonstrates extension into adjacent pelvic organs, facilitating assessment of lesion depth and multifocal involvement. IDEA protocol can also be applied on MRI.

MRI features of adenomyosis includes junctional zone thickness greater than 12 mm, irregular or poorly defined junctional zone, diffuse or focal low signal myometrial thickening on T2 WI, Tiny hyperintense cystic foci on T2 or T1 WI, globular uterine enlargement, and focal adenomyomatosis producing mass-like lesions.

One of the greatest strengths of MRI is comprehensive disease mapping. It reliably detects bowel involvement, bladder infiltration, ureteric disease, diaphragmatic implants, abdominal wall endometriosis, and other extra-pelvic manifestations that may not be completely visualized on ultrasound.

USG AND MRI: COMPLEMENTARY RATHER THAN COMPETITIVE

Although comparisons between USG and MRI are common, the two imaging modalities should be viewed as complementary rather than competing investigations.

Ultrasound offers dynamic assessment, superior evaluation of pelvic organ mobility, real-time tenderness-guided examinations, and excellent diagnostic performance in experienced hands. It remains the preferred first-line investigation because of its availability, low cost, and ability to evaluate disease during routine gynecological assessment.

MRI provides panoramic visualization of the pelvis, superior assessment of inaccessible anatomical compartments, accurate disease mapping, and excellent reproducibility. It is particularly valuable for complex disease, obesity, equivocal USG findings, and preoperative planning.

Together USG and MRI provide comprehensive characterization of disease burden, allowing clinicians to tailor medical or surgical treatment according to individual patient needs.

CLINICAL IMPACT

The widespread adoption of advanced imaging has fundamentally altered clinical management of endometriosis and adenomyosis. Early diagnosis enables timely initiation of hormonal therapy, potentially slowing disease progression and reducing chronic pain. Accurate preoperative mapping decreases operative time, minimizes surgical complications, and facilitates multidisciplinary management of complex diseases.

For women seeking fertility, imaging provides crucial information regarding ovarian reserve, tubo-ovarian anatomy, uterine integrity, and extent of disease; helping clinicians to choose appropriate management among conservative treatment, assisted reproductive techniques, or surgery.

Imaging also plays an important role in post operative surveillance, assessment of recurrent disease, monitoring response to medical therapy, and guiding minimally invasive image-guided interventions wherever appropriate.

TAKE HOME POINTS:

- The role of imaging in endometriosis and adenomyosis has evolved far beyond simple lesion detection. High-resolution transvaginal ultrasound (TVS), supported by standardized protocols such as IDEA and MUSA, has

become the cornerstone of initial diagnosis because of its dynamic assessment, accessibility, and excellent diagnostic performance.

- MRI complements USG by providing unparalleled soft-tissue characterization, comprehensive pelvic mapping, and accurate assessment of deep infiltrating and multifocal disease. Rather than functioning as competing imaging modalities, USG and MRI work synergistically to provide a complete understanding of disease extent and severity.
- By enabling early diagnosis, individualized treatment planning, fertility preservation and improved surgical outcomes, modern imaging allows clinicians to truly see beyond symptoms, shifting the focus from merely identifying disease to delivering precise patient centered care.
- Further upcoming advances in imaging technology, structured reporting, and artificial intelligence are expected to further strengthen the role of radiology in the multidisciplinary management of these complex gynecological disorders.

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From Symptom Relief to Disease Modification: Recent Advances in the Medical Management of Endometriosis and Adenomyosis

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INTRODUCTION

Endometriosis and adenomyosis are chronic estrogen-dependent inflammatory disorders affecting a substantial proportion of women of reproductive age and are major contributors to chronic pelvic pain, dysmenorrhea, dyspareunia, infertility, and impaired quality of life. Endometriosis is defined by the presence of endometrial-like tissue outside the uterine cavity, while adenomyosis is characterized by ectopic endometrial glands and stroma within the myometrium. Both conditions are now increasingly recognized as part of a spectrum of estrogen-dependent inflammatory uterine disorders.

Historically, management strategies have been largely symptomatic, focusing on suppression of ovarian steroidogenesis or surgical removal of lesions. However, recurrence after treatment discontinuation remains common, highlighting the limitations of purely suppressive therapies. This has led to a paradigm shift toward therapies that may alter disease progression and underlying pathophysiology and lead to disease modification and not just symptom relief.

PATHOPHYSIOLOGY

The rationale for disease-modifying therapy arises from the complex, multifactorial biology of endometriosis and adenomyosis.

Estrogen dependence

Both diseases are characterized by local estrogen production through increased aromatase activity, creating an autocrine inflammatory loop that promotes lesion survival and proliferation.

Progesterone resistance

Reduced progesterone receptor expression leads to impaired decidualization and diminished anti-inflammatory effects, contributing to persistent lesion activity and treatment resistance.

Chronic inflammation

Elevated levels of inflammatory mediators such as IL-1β, IL-6, TNF-α, and prostaglandin E2 promote pain generation, angiogenesis, and tissue remodeling.

Angiogenesis and neurogenesis

VEGF-driven angiogenesis and nerve growth factor–mediated neurogenesis contribute to lesion survival and central sensitization, explaining pain severity disproportionate to lesion burden.

Fibrosis

TGF-β-mediated fibrosis is particularly important in adenomyosis and deep infiltrating endometriosis, contributing to structural distortion and chronic pain.

Neuroangiogenesis

Increased expression of vascular endothelial growth factor (VEGF) stimulates angiogenesis, while nerve growth factor promotes sensory nerve proliferation, contributing to chronic pain and central sensitization.

GOALS OF MEDICAL MANAGEMENT

The objectives of medical therapy have evolved considerably over recent decades. Contemporary management aims to:

- Relieve pain symptoms
- Improve quality of life
- Prevent disease progression
- Reduce recurrence following surgery
- Preserve fertility whenever possible
- Minimize adverse effects associated with long-term treatment
- Reduce repeated surgical interventions

True disease-modifying therapy should ideally prevent lesion establishment, inhibit fibrosis, restore immune homeostasis, and produce durable remission after discontinuation of treatment. At present, no available therapy completely fulfills these criteria; however, several newer treatments demonstrate partial disease-modifying effects.

CURRENT MEDICAL MANAGEMENT: SYMPTOM CONTROL

1. **Combined hormonal contraceptives**

   Combined oral contraceptives remain first-line therapy for many patients. They suppress ovulation, reduce menstrual flow, and improve dysmenorrhea. However, they do not eliminate lesions and symptoms often recur after discontinuation.

2. **Progestins**

   Progestins such as dienogest, norethisterone acetate, and levonorgestrel intrauterine systems act through decidualization, anti-inflammatory effects, and ovulation suppression. They are effective for long-term symptom control and may reduce lesion activity.

3. **GnRH agonists**

   GnRH agonists induce hypoestrogenism through pituitary downregulation. These agents are given for pre-operative disease burden reduction or post-operative disease suppression along with surgical intervention. The effect is temporary and dose more than 3-4 monthly injections is avoided due to menopausal side effects and bone loss, requiring add-back therapy. These agents are also used for reduction in size of the lesion and associated inflammation for women undergoing IVF cycle.

4. **GnRH antagonists**

   Oral GnRH antagonists (elagolix, relugolix, linzagolix) provide rapid, reversible, dose-dependent estrogen suppression without flare effect. Clinical trials demonstrate significant improvement in pain and quality of life.

   Relugolix combination therapy has also shown efficacy in both endometriosis and adenomyosis, reducing uterine volume and pain while improving tolerability.

5. **Non-Hormonal Therapies**

   NSAIDs

   NSAIDs reduce prostaglandin-mediated pain but do not influence disease progression

AROMATASE INHIBITORS

Recognition that endometriotic lesions possess intrinsic aromatase activity has led to the use of aromatase inhibitors (AIs) in refractory disease. Unlike ovarian estrogen suppression alone, aromatase inhibitors reduce both ovarian and local estrogen production within endometriotic lesions.

Letrozole and anastrozole are commonly used aromatase inhibitors reduce both ovarian and peripheral estrogen production and are used in refractory disease, often combined with progestins or GnRH analogues. Clinical studies have demonstrated:

- Reduction in pelvic pain
- Decrease in lesion volume
- Improvement in deep infiltrating endometriosis
- Benefit in women who have failed conventional hormonal therapy

However, long-term use is limited by hypoestrogenic adverse effects including bone loss, arthralgia, and vasomotor symptoms. Current guidelines reserve aromatase inhibitors for severe refractory disease managed by specialist.

6. **Emerging Disease-Modifying Strategies**

   Disease-modifying therapy aims to interfere with the pathological mechanisms responsible for initiation, progression, and recurrence.

   An ideal disease-modifying therapy should:

   - Prevent implantation of ectopic endometrial cells
   - Suppress chronic inflammation
   - Reverse progesterone resistance
   - Inhibit angiogenesis
   - Prevent fibrosis and adhesion formation
   - Normalize immune dysfunction
   - Reduce neurogenesis
   - Prevent recurrence after discontinuation

No currently available therapy fulfills all these criteria; however, several investigational treatments target these mechanisms simultaneously.

ANTI-INFLAMMATORY TARGETING

Inflammatory signaling pathways such as NF-κB and cytokine cascades are central to disease persistence. Experimental therapies targeting TNF-α, IL-6, and NF-κB show promise in preclinical studies but limited clinical translation.

ANTI-FIBROTIC THERAPIES

Fibrosis is a key determinant of chronic pain and structural disease, especially in adenomyosis. Agents such as metformin and pirfenidone demonstrate anti-fibrotic effects through modulation of TGF-β signaling.

ANTI-ANGIOGENIC APPROACHES

VEGF inhibition reduces lesion vascularization in experimental models; however, concerns regarding fertility and pregnancy limit clinical use.

7. **Neurogenic pain modulation**

   Targeting nerve growth factor and pain pathways (TRPV1, sodium channels) offers potential for treating pain independent of hormonal suppression.

IMMUNE MODULATION

Defective immune surveillance, including impaired NK cell activity and macrophage polarization, is a hallmark of disease. Immune-targeted therapies remain investigational.

Pirfenidone

Pirfenidone inhibits TGF-β signaling and collagen synthesis. Animal studies demonstrate:

- Reduced fibrosis
- Smaller lesions
- Less adhesion formation

Human studies remain limited.

8. Metformin

Originally developed for diabetes mellitus, metformin has attracted attention because of its:

- Anti-inflammatory properties
- Anti-proliferative effects
- Anti-fibrotic activity
- Reduction in aromatase expression

Several small clinical studies have reported reductions in pelvic pain and lesion size, although larger randomized trials are required before routine use can be recommended.

9. Epigenetic Therapies

Accumulating evidence suggests that endometriosis is partly an epigenetic disease.

Abnormal DNA methylation and histone modification contribute to:

- Progesterone resistance
- Aromatase overexpression
- Estrogen dominance
- Chronic inflammation

Investigational therapies include:

- Histone deacetylase inhibitors
- DNA methyltransferase inhibitors
- MicroRNA-targeted therapies

Although these approaches remain experimental, they offer the possibility of correcting disease at the molecular level.

MICRORNA-BASED THERAPEUTICS

MicroRNAs (miRNAs) regulate gene expression after transcription. Several dysregulated miRNAs have been identified in endometriosis and adenomyosis.

Future therapies may involve:

- miRNA mimics
- Anti-miRNA oligonucleotides
- Nanoparticle-mediated miRNA delivery

Because individual miRNAs regulate multiple signaling pathways simultaneously, they may offer broader disease-modifying effects than single-target drugs.

STEM CELL-BASED THERAPY

Emerging evidence suggests that endometrial progenitor cells contribute to lesion formation.

Experimental stem-cell therapies aim to:

- Restore normal immune function
- Reduce fibrosis
- Promote tissue repair
- Modulate inflammatory responses

Mesenchymal stem cells possess anti-inflammatory properties but may also stimulate angiogenesis under certain conditions. Consequently, their therapeutic role remains controversial and requires further investigation.

FERTILITY CONSIDERATIONS

Both conditions are associated with infertility due to inflammation, anatomical distortion, and impaired implantation. Importantly, medical therapy does not improve spontaneous conception rates and should not delay fertility treatment when indicated. Assisted reproductive technologies remain central in fertility management.

FUTURE DIRECTIONS

Future therapeutic development is focused on true disease modification rather than hormonal suppression alone. Promising areas include:

- Epigenetic therapy (DNA methylation and histone modification)
- MicroRNA-based therapeutics
- Nanoparticle drug delivery systems
- Metabolic reprogramming agents
- Multi-target combination therapies
- Regenerative and immune-restorative strategies

These approaches aim to alter disease trajectory, reduce recurrence, and potentially prevent progression.

CONCLUSION

Endometriosis and adenomyosis are complex chronic inflammatory diseases that extend beyond hormonal dysfunction. Current therapies primarily provide symptom relief through hormonal suppression but do not consistently modify disease progression. Advances in understanding inflammation, fibrosis, neurogenesis, and immune dysregulation have led to the emergence of novel therapeutic targets. Oral GnRH antagonists represent a major clinical advancement, yet true disease-modifying therapies remain in development. The future of management lies in precision medicine and multi-targeted interventions that address the underlying biology of disease rather than symptoms alone.

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Beyond Excision: Recent Advances in Fertility-Enhancing Surgery for Endometriosis

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INTRODUCTION

Endometriosis is a chronic, oestrogen-dependent inflammatory condition affecting ~10% of reproductive-age women, in which endometrial-like tissue grows outside the uterine cavity and causes fibrosis that impairs quality of life and fertility. It presents as three overlapping phenotypes: superficial peritoneal disease, ovarian endometriomas (OMA), and deep infiltrating endometriosis (DIE). These phenotypes impair fertility through mechanisms including anatomical distortion, oxidative stress, and impaired endometrial receptivity. Fecundity falls to 2–10% in untreated women, compared with 15–20% in normal couples.[1]

PATHOPHYSIOLOGY OF INFERTILITY IN ENDOMETRIOSIS

The mechanisms underlying reduced fertility remain incompletely understood but include:

- **Anatomical disruption:** pelvic adhesions and distorted tubo-ovarian anatomy impair ovulation, oocyte pickup, and tubal transport.
- **Inflammatory environment:** cytokines and immune cells in the peritoneal fluid create an environment hostile to ovulation and fertilisation.
- **Ovarian dysfunction:** endometriomas cause oxidative stress and impaired blood flow, reducing follicular reserve.
- **Endometrial receptivity:** progesterone resistance may narrow the implantation window, though recent evidence suggests this effect is minor in most women.

CLASSIFICATION AND PROGNOSTIC TOOLS

Traditional staging (rASRM) standardises disease severity but does not reliably predict fertility outcomes.[1]

- **Endometriosis Fertility Index (EFI):** This validated score combines patient history with surgical findings to estimate spontaneous pregnancy rates; scores above 7 predict good outcomes, while lower scores warrant earlier ART referral.[2]
- **Enzian Classification:** Used alongside rASRM to detail deep infiltrating lesions, particularly retroperitoneal disease.[3]

INDICATIONS FOR SURGERY

Surgery is generally recommended for:

- **Pain:** severe dysmenorrhea, dyspareunia, or chronic pelvic pain unresponsive to medical therapy.
- **Organ compromise:** bowel or urinary tract obstruction, hydronephrosis, or ureteral stenosis.
- **Size and nature of the endometrioma:** cysts >3–4 cm which limit the access to ovarian follicles during ART, or features suspicious for malignancy.
- **Infertility:** to restore anatomy and enhance natural conception, or as an adjunct after failed ART.

SURGICAL MANAGEMENT ACCORDING TO PHENOTYPE

Treatment should be tailored to disease phenotype, symptoms, and reproductive goals. Surgery can restore pelvic anatomy and relieve pain, but its effect on fertility is controversial and depends on disease stage and type.

Minimal and Mild Endometriosis (MME): Routine surgery for MME (rASRM I/II) modestly improves spontaneous conception over diagnostic laparoscopy alone, but is not recommended in asymptomatic women purely to enhance fertility before ART.[1]

Ovarian Endometriomas (OMA): Endometrioma surgery remains controversial, as it may reduce ovarian reserve.

- **Technique evolution:** traditional cystectomy (stripping) reduces AMH by 30–44%; modern techniques aim to minimise damage to the ovarian hilum.9
- **Cautery and haemostasis:** after cyst-wall stripping, bleeding points may be controlled by suturing, bipolar coagulation, or ultrasonic (harmonic) energy. Both bipolar (highest) and ultrasonic haemostasis cause significantly greater falls in FSH and AMH than suturing, reflecting thermal spread into adjacent healthy cortex and the vascular pedicle; the injury is dose-dependent, worsening with prolonged or diffuse application rather than brief, targeted coagulation of isolated bleeding points.4,5 The evidence favours a hierarchy of non-thermal approaches: gauze tamponade or suturing, with epinephrine infiltration as an adjunct over electrosurgical energy whenever future fertility is the priority, reserving bipolar or harmonic coagulation for bleeding that fails to respond to these measures.
- **Ablation vs. excision:** CO_2 laser or plasma energy ablation may preserve ovarian reserve better than cystectomy, with similar pregnancy and recurrence rates.

- Sclerotherapy: ethanol sclerotherapy for larger endometriomas (>4 cm) is an emerging, reserve-sparing alternative before ART.

Deep Infiltrating Endometriosis (DIE): DIE surgery is technically demanding and requires specialised centres.

- **Conception:** spontaneous pregnancy rates exceed 50–60% after surgery for symptomatic DIE.10
- **Bowel involvement:** approaches to colorectal deep infiltrating endometriosis (DIE) include rectal shaving, discoid resection, and segmental bowel resection. Complete excision improves spontaneous pregnancy rates even in patients who have previously failed IVF, with over half of such patients conceiving after surgery.6
- **Nerve-sparing techniques:** sparing the inferior hypogastric and pelvic splanchnic nerves is now prioritised to reduce postoperative bladder and bowel dysfunction.

MINIMALLY INVASIVE SURGERY (MIS)

Laparoscopy remains the gold standard against which newer platforms, continue to be benchmarked. With availability of Robotic system, the surgery can be performed more easily, although clear benefits of robotic route over traditional laparoscopy are not clear except for surgeon's comfort.[7]

NEW TECHNOLOGIES IN SURGICAL MANAGEMENT

Minimally invasive surgery is increasingly enhanced by newer technologies beyond traditional laparoscopy.

Advanced Minimally Invasive Surgical Management:

Sclerotherapy: aspiration of cyst contents followed by 95–99% ethanol instillation (5–10 minutes) ablates the endometriotic epithelium, offering a reserve-sparing alternative under transvaginal ultrasound guidance or laparoscopically (Table 1).

- Indications: unilocular endometrioma >4 cm without malignancy features; recurrent endometrioma; diminished reserve or a single functioning ovary; DIE/adhesions favouring the laparoscopic route.
- Contraindications: sonographic features suspicious for malignancy; multilocular or non-endometriotic cysts; inaccessible cyst; active infection or coagulopathy.

Table 1: Advantages and disadvantages of USG-guided vs laparoscopic sclerotherapy

USG-guided Sclerotherapy	Laparoscopic Sclerotherapy
Advantages: office-based, no general anaesthesia, low cost, reserve preservation, easily repeated.	Advantages: direct visualisation, simultaneous treatment of DIE/adhesions, biopsy possible.
Disadvantages: no view of extra-ovarian disease, no tissue diagnosis, cannot treat adhesions or DIE.	Disadvantages: general anaesthesia, higher cost, peritoneal entry, small Grade III complication risk.

Robot-Assisted Surgery (RAS): robotic platforms (Da Vinci, Medtronic Hugo™) have transformed complex DIE surgery, offering 3D stereoscopic vision, endowristed instruments with seven degrees of freedom, and tremor control/motion scaling for precise dissection near the ureters and pelvic nerves. Operative time may be longer than laparoscopy, but blood loss and complication rates are similar, with better surgeon ergonomics.[7]

Novel Access Methods: vNOTES and LESS: Advanced endometriosis can be treated by either Vaginal Natural Orifice Transluminal Endoscopic Surgery (vNOTES) or its robotic variant, RvNOTES, with no abdominal scars visible. This technique has been successfully used for meticulous lesion resection and total hysterectomies in patients with stage IV disease, even in cases involving complete cul-de-sac obliteration. Additionally, laparo-endoscopic single-site surgery (LESS) and robotic single-site surgery (RSSS) use a single incision, usually through the umbilicus, to further minimise surgical trauma and improve cosmetic results.

Imaging and Artificial Intelligence: Accurate visualisation of small or hidden lesions remains the most difficult aspect of endometriosis surgery.

NIR-ICG Fluorescence-Guided Surgery: near-infrared imaging with intravenous indocyanine green helps detect neovascularised lesions invisible under white light, and aids assessment of bowel perfusion intraoperatively. For ureteric identification, ICG instilled intraureterally via cystoscopic catheterisation before surgery allows the ureter to be visualised in real time on near-infrared imaging as it courses through dense adhesions, endometriotic nodules, or parametrial tissue, even where it cannot be traced under white light; this technique has been shown to shorten the duration of ureterolysis and reduce operative time in deep infiltrating endometriosis surgery, with a low reported complication rate (Figure 1).[8]

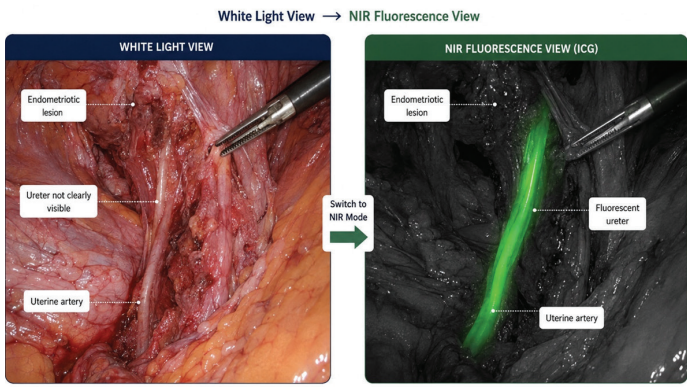


Figure 1: Intraoperative identification of the ureter using ICG fluorescence

ENERGY-BASED AND THERMAL THERAPIES

Photodynamic therapy (light-activated photosensitisers) and photothermal therapy (near-infrared lasers with nanoparticles) selectively destroy endometriotic tissue and may suit lesions where surgery carries high risk, such as diaphragmatic disease. Magnetic-nanoparticle

hyperthermia similarly ablates lesions while preserving normal ovarian tissue in animal models.

MOLECULAR, NANOTECHNOLOGY AND CELLULAR APPROACHES

Targeted nanoparticles and hydrogel-based local drug delivery aim to reduce oxidative stress and lesion growth with fewer systemic effects. Gene therapy (siRNA against angiogenic and adhesion-related genes) and immunotherapy (checkpoint inhibitors targeting immune clearance; anti-CTLA-4 antibodies or anti-CD47 therapy) address the molecular and immunological drivers of disease, while mesenchymal and adipose-derived stem cells show early promise for tissue repair and targeted drug delivery. All remain investigational, without clinical-grade evidence.

ADHESION PREVENTION AND NON-INVASIVE DIAGNOSIS

Post-operative adhesions are a major cause of chronic pain and infertility. New innovations like **4DryField® PH,** a starch-based powder, reduce post-operative adhesions by up to 85%, alongside other polysaccharide and temperature-sensitive barriers.

Diagnostic delay for endometriosis averages 6–10 years. Emerging non-invasive tools, including salivary microRNA signatures and exosomal long non-coding RNAs, show promising diagnostic accuracy and may eventually reduce reliance on laparoscopy for diagnosis, pending larger validation studies.

CLINICAL DECISION-MAKING: GUIDELINES AND MANAGEMENT ALGORITHMS

The choice between surgery and immediate ART should follow a multidisciplinary approach, weighing disease phenotype, ovarian reserve, and patient preference against current evidence and international guidelines. The following step-wise, integrated management algorithm for endometriosis-associated infertility is proposed (Figures 2 and 3).

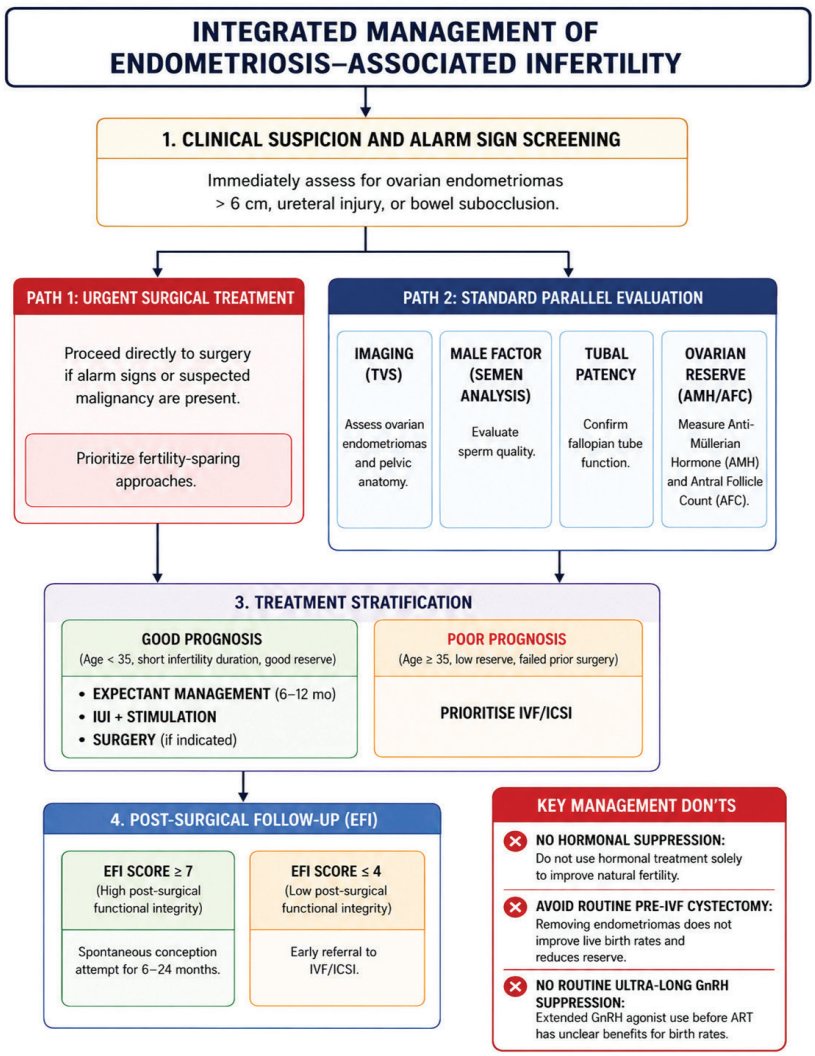


Figure 2: Flowchart showing integrated management of endometriosis with infertility management

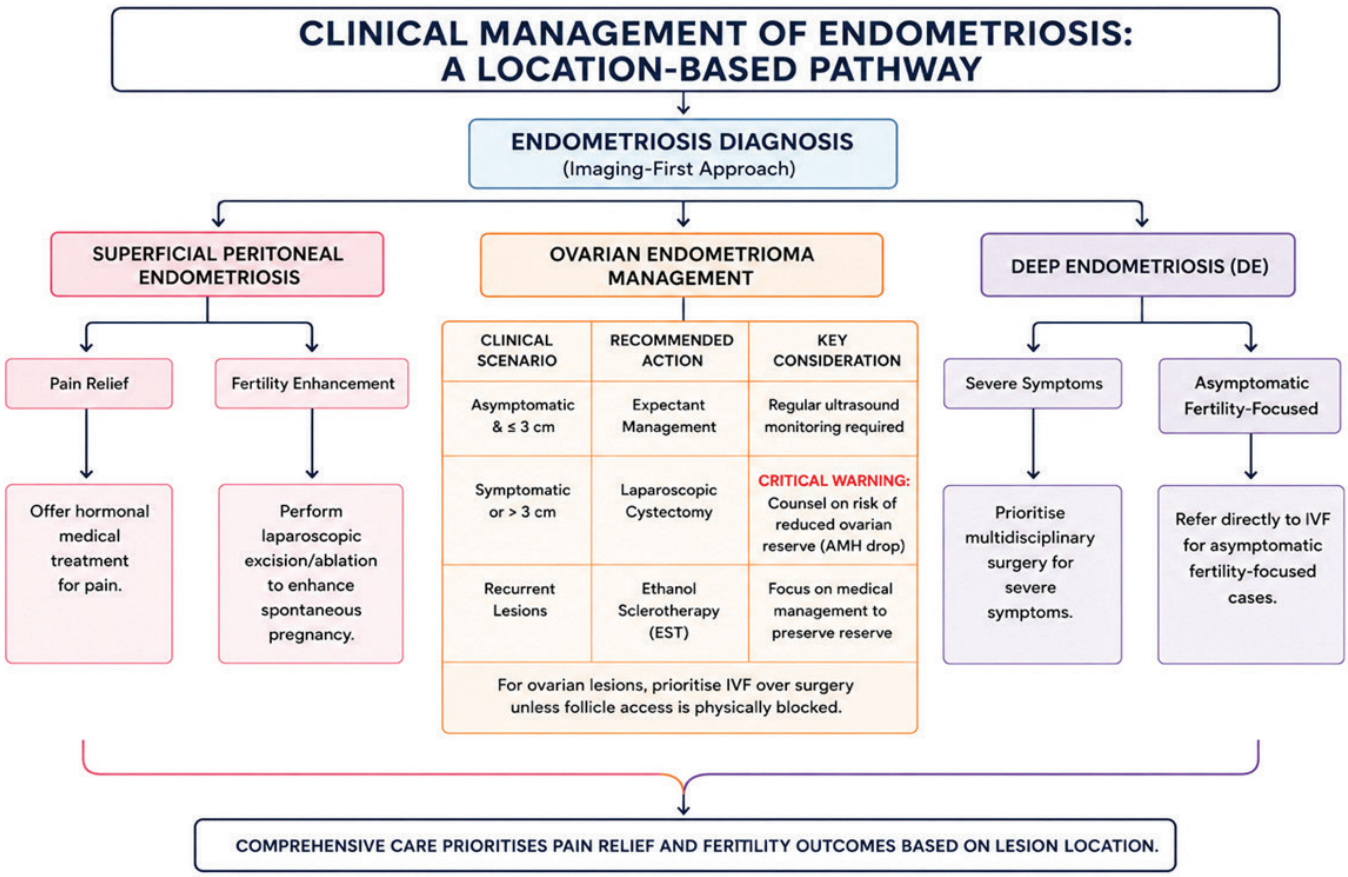


Figure 3: A flowchart showing the management based on Lesion Location.

CONCLUSION AND FUTURE PERSPECTIVES

Surgery remains valuable for improving fertility in endometriosis but should be reserved for symptomatic or obstructive disease. The choice between surgery and immediate ART should be individualised, guided by the Endometriosis Fertility Index (EFI), ovarian reserve, and patient preference.

Management is shifting from a one-size-fits-all approach to personalised, precision-guided care. Advances in imaging and robotic surgery are already improving outcomes, while AI diagnostics, nanomedicine, and immunotherapy may eventually target the disease's underlying molecular drivers. Large-scale clinical trials are needed before these approaches can be considered part of the clinical standard.

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Redefining Adenomyosis Surgery: Recent Advances in fertility enhancing surgery of adenomyosis

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INTRODUCTION

The management of adenomyosis (AM) remains challenging and controversial, requiring an individualized approach based on the woman's age, parity, future fertility desire, size, location, and extent of the lesion, its relationship to the endometrial cavity, the degree of junctional zone involvement, and any previous medical or surgical treatment. Among these factors, the type of adenomyotic lesion, its anatomical location, and junctional zone thickness are strong predictors of fertility outcomes.

Based on current available evidence and literature, conservative surgery for adenomyosis is not routinely recommended solely for fertility enhancement. It may be individualised on a case by case basis and considered in following clinical situations:

- Symptomatic focal adenomyoma (dysmenorrhea, pelvic pain, menorrhagia)
- Symptomatic diffuse adenomyosis associated with significant uterine enlargement (uterine size >14 weeks gestational size, or uterine volume >200 cm^3)
- Persistent lesion despite medical intervention
- Infertility and/or history of recurrent pregnancy loss (RPL) or recurrent implantation failure (RIF) attributed to adenomyosis.[1]

The primary goals of conservative surgery for adenomyosis are:

- To achieve maximal, and ideally complete excision of adenomyotic tissue
- To preserve integrity of endometrial cavity
- To restore normal uterine anatomy by optimal uterine reconstruction
- To preserve functionality of ovaries and tubes

Broadly, fertility-sparing surgical approaches for adenomyosis can be classified into three categories: (a) complete excision of adenomyotic tissue, (b) partial excision or debulking procedures, and (c) non-excisional techniques.

Symptom control is generally achieved through removal of the bulk of adenomyotic tissue, whereas successful spontaneous conception depends on preservation of the endometrial cavity and restoration of normal uterine architecture while minimizing postoperative intrauterine adhesions and cavity distortion.

Pre-Surgical Downsizing: In women with large adenomyotic uteri (>14-16 weeks) or with anaemia , surgeons often pre-treat patients with GnRH agonists (like leuprolide) or antagonists (like relugolix) for 3 to 4 months to reduce uterine volume before attempting surgery.

Excisional surgery (Adeno-myomectomy): This procedure involves resecting the adenomyotic lesions while preserving the uterus which can be done through laparotomy or minimally invasive route (laparoscopy or robotic) . The main surgical challenge is lack of distinct plane between adenomyotic tissue and normal myometrium leading to possibility to over or under excision of the lesion. For best surgical outcomes, meticulous pre-operative lesion mapping (ultrasound and/or MRI) is must.

In contrast to traditional wedge resection procedure, various uterine reconstruction methods (double flap, triple-flap, overlapping flaps, or U- or H-suturing) have been developed to reduce the myometrial defect and for better strengthening of uterine wall. These modified approaches are feasible for both focal and diffuse adenomyosis. There is not enough evidence to support one technique over another and may be individualised as per site and extent of lesion and surgeon expertise. Overall the results are better in focal adenomyoma than diffuse adenomyosis.

Triple-flap method (Osada's technique): Described initially for open approach, this involves midline bisection of uterus until the endometrial cavity is opened. The surgeon uses palpation with index finger into cavity to facilitate maximum excision of adenomyotic tissue and grasping of adenomyotic tissues with clamp to excise them from the surrounding myometrium leaving a myometrial thickness of 1 cm from serosa and endometrium. Then, the endometrium is initially closed, and the flaps of uterine wall are approximated from one side of the bisected uterus to the anteroposterior plane of the other side while the contralateral side of the uterine wall is brought over the already reconstructed part of uterus in such a way as to cover it (2)adenomyomectomy can improve symptoms and restore anatomy while maintaining fertility potential. Limited but comparable perioperative outcomes exist for minimally invasive methods of adenomyomectomy, and most involve resection of focal, not diffuse, adenomyosis. Among the literature involving resection of diffuse adenomyosis using minimally invasive methods, relatively small volumes of resected tissue are reported and none include obstetric outcomes. Most published reports for

excision of diffuse adenomyosis involve laparotomic resection, likely because of specific intraoperative challenges curtailed by this approach. In response, a laparoscopic-assisted laparotomic approach was developed in 2011 by Dr. Hisao Osada, a reproductive surgeon in Japan. This procedure involves aggressive excision of adenomyotic tissue with prophylactic hemostatic techniques and subsequent uterine wall reconstruction using a triple-flap method. Compared with other excisional methods for diffuse adenomyomectomy, the Osada procedure has the best reported obstetric outcomes.\nPATIENT(S. The defect closure may be done with delayed absorbable sutures like 1-0 Vicryl or preferably barbed (1-0 V-Loc) sutures for better approximation. The triple-flap method offer several advantages, enabling wider and more thorough excision of affected tissue than conventional wedge resection. With further modification, the procedure can be done through laparoscopic or robotic route and opening of endometrial cavity may be avoided if precise image depicting relation of lesion to the endometrial lining is available.

Figure 1 describes the basic steps of laparoscopic adeno-myomectomy using triple flap technique.

Recently, there has been concept of impact of surgical timing within the menstrual cycle as a potentially modifiable factor affecting the surgical recovery. In contrast to standard window for reproductive surgeries in follicular phase, there has been a concept of **secretory phase adeno-myomectomy** which has shown significantly lower recurrence rate and improved long term outcomes as stromal edema and hypervascularisation enhance intraoperative visualisation and precise excision of lesion. In patients with regular cycles, scheduling surgery based on the last menstrual period, typically targeting days 17–25 of a 28-day cycle, is feasible. Additional precision may be achieved using ovulation predictor kits or mid-luteal serum progesterone levels. For patients with irregular cycles, hormonal profiling may aid phase determination. The effectiveness of secretory phase-guided adeno-myomectomy in routine practice needs to confirmed with more prospective data.[3]

Four-petal method of adeno-myomectomy has been defined for focal adenomyoma which begins with a cruciate incision to turn the adenomyoma into the shape of blooming four-petal flower to completely expose the lesion and maximize removal of adenomyotic tissue. During excision, around 1 cm thick myometrium is preserved at sub-endometrial region and around 0.5 cm thick serosa flap is also left in each petal. The myometrial defect is closed as mentioned above.[4]

Contraceptive period after adeno-myomectomy: Postoperative field in the myometrium is observed as an avascular area on using coloured Doppler imaging and contrast-enhanced MRI. Pregnancy can be attempted after confirming resumption of blood flow which may resume within 6-9 months. However, when the uterine wall was largely resected, the resumption of blood flow could be delayed by 1 year or more depending upon extensiveness of surgery.

HYSTEROSCOPIC TREATMENT OF INNER MYOMETRIUM/JUNCTIONAL ZONE ADENOMYOTIC CYSTIC LESIONS

The adenomyotic lesions adjacent to junctional zone and inner myometrium on imaging may appear as irregular endometrium with tiny openings seen on endometrial surface, hypervascularisation, endometrial "strawberry" pattern, fibrous cystic appearance of intrauterine lesions, haemorrhagic cystic lesions presenting with dark blue or chocolate brown appearance.

The decision to surgically resect these lesions through hysteroscopy route may be considered in patients with RIF/recurrent implantation failure and cyst refractory to pharmacologic treatment (S. estradiol >40pg/ml and no shrinkage of lesion even with leuprolide 3.75mg for atleast 2-3 months and letrozole 2.5mg/day for 3 months).[5]

Non-excisional methods: These includes high- intensity focused ultrasound (HIFU), radiofrequency ablation (RFA), laparoscopic or percutaneous microwave ablation (MWA) and uterine artery embolization (UAE).

HIFU is effective and non-invasive, but it is time-consuming. The lesions' location and vascularity limit its indication and effectiveness. This can be done either through USG or MRI guidance. Optimal outcome of HIFU depends on appropriate patient selection: anterior lesion site, low vascularization, fewer number of hyperintense foci on MRI & type III intramural adenomyosis.[6]

RFA and MWA are traditionally done under USG guidance. In RFA, a high-frequency alternating electrical current is used to create ionic agitation producing frictional heat to achieve tissue necrosis. MWA is the most recent and exciting technological advances in the thermo-ablative field, which uses electromagnetic energy to rotate adjacent polar water molecules and produce heat rapidly. MWA generates high temperatures (typically >100°C), resulting in coagulative necrosis of adenomyotic tissue and subsequent reduction in lesion volume. Although the reports on pain relief and lesion size reduction are promising, long term fertility and pregnancy outcome are lacking and need further prospective data. This may be opted for women with small adenomyotic lesions (**< 5 cm:** Treated with a **single** microwave ablation antenna & **> 5 cm:** Treated with **double/multiple** microwave antennas)

Recently, there have been modifications to do these procedures through laparoscopic route along with USG to provide safe and precise intervention without risk of thermal injury to adjacent tissues[7] Figure 2 describes the steps of

Laparoscopic and USG guided MWA for adenomyosis. Although these procedures have shown promising results, the lack of professional society guidelines underscores the need for harmonized protocols in order to standardize the diagnosis, surgery, and reporting of results.

PREGNANCY AFTER ADENO-MYOMECTOMY SURGERY

Adenomyosis is an independent risk factor for adverse obstetric outcomes including spontaneous miscarriage, preeclampsia, fetal growth restriction, preterm birth, preterm premature rupture of membranes (PPROM), placenta accreta spectrum disorders, and postpartum haemorrhage. In addition, women with diffuse adenomyosis are at an increased risk of antepartum or intrapartum uterine rupture, with reported incidences of up to 6%. Consequently, pregnancies complicated by adenomyosis require close antenatal surveillance and regular monitoring. Although vaginal delivery may be feasible in selected cases, elective caesarean section is often considered the safer mode of delivery, particularly in women with extensive disease or following fertility-preserving surgery.

KEY POINTS

- Management of adenomyosis should be individualized according to symptoms, fertility goals, and disease characteristics
- Fertility-preserving surgery is reserved for selected women and aims to maximize lesion excision while preserving uterine integrity
- Adeno-myomectomy remains the standard approach, whereas HIFU, RFA, MWA, and UAE are emerging alternatives with limited fertility data
- Careful postoperative and obstetric surveillance is essential

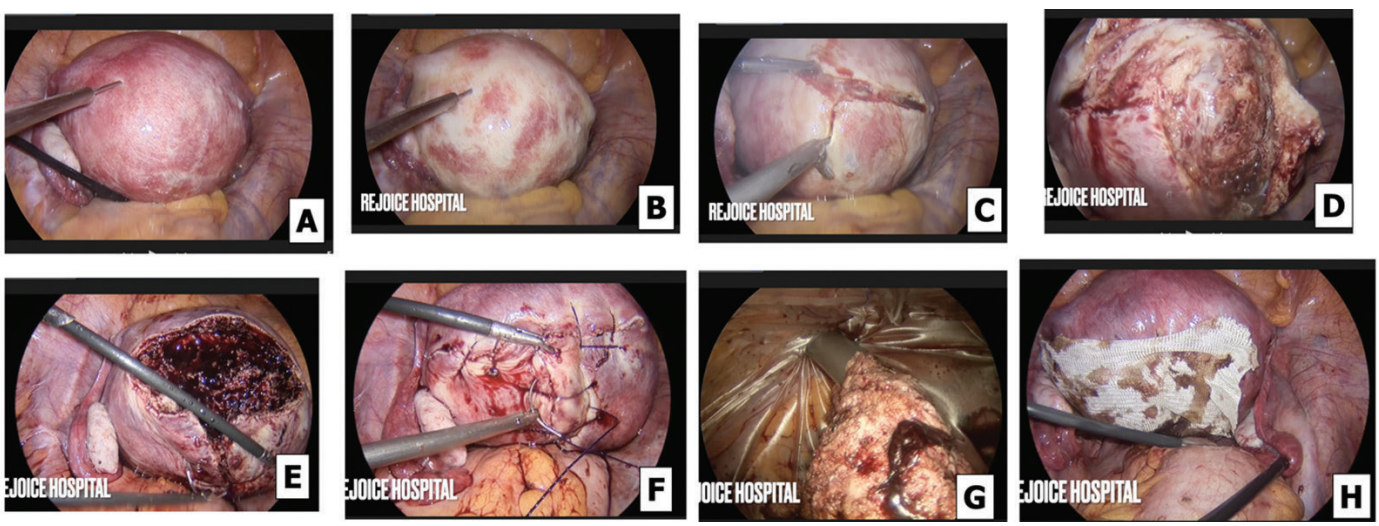


Figure 1. Steps of laparoscopic adeno-myomectomy using triple flap technique

(A)- Enlarged uterus with diffuse adenomyotic lesion at fundo-posterior location; (B)- Blanching of myometrium following injection of diluted vasopressin (1 in 10 dilution); (C)- T shaped incision given over the lesion to create triple flap covering maximum area of adenomyosis; (D)- bulge of the adenomyosis lesion after triple flap creation; (E)- Myometrial defect after removal of adenomyotic tissue as completely as possible, leaving a thin rim (10 mm) of myometrium adjacent to the endometrial cavity to avoid entering the cavity whenever feasible; similar thickness of outer myometrium beneath the serosa is also preserved; (F)- Tension-free triple flap closure using barbed suture; (G)- Contained-in-bag morcellation (CIBM) of adenomyotic specimen; (H)- After confirming meticulous hemostasis, adhesion barrier (Interceed) to reduce postoperative adhesions

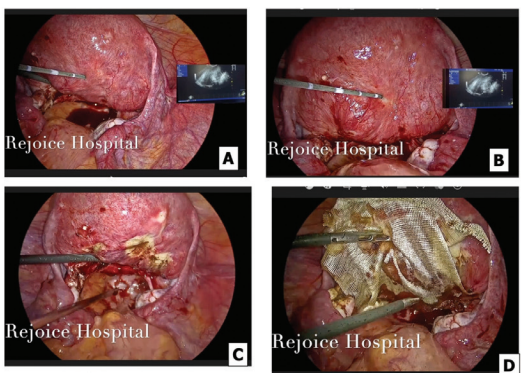


Figure 2. Steps of Laparoscopic and USG guided MWA for adenomyosis

(A & B)- Microwave antenna placed through laparoscopic port into centre of adenomyoma under ultrasonic guidance; (C)- Pale white to grey discoloration (blanching) of uterine serosa overlying the treated lesion due to thermal coagulation; (D)- Adhesion barrier (Interceed) is used to reduce postoperative adhesions

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Calendar for AOGD Monthly Clinical Meeting 2026-2027

27th August 2026	AIIMS
25th September 2026	VMMC &Safdarjung Hospital
30th October 2026	DDU Hospital
27th November 2026	MAMC & LNJP Hospital
18th December 2026	Sir Ganga Ram Hospital
29th January 2027	Dr RML Hospital
26th February 2027	UCMS & GTB Hospital
19th March 2027	LHMC & SSK Hospital
30th April 2027	ESI, Basaidarapur Hospital

Fertility Preservation in Endometriosis

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INTRODUCTION

Endometriosis is a chronic estrogen-dependent inflammatory disease affecting approximately 10% of reproductive-aged women and up to 50% of women with infertility.[1] Both the disease and its treatment may impair fertility. Chronic inflammation and fibrosis can progressively reduce ovarian reserve, while ovarian cystectomy may further diminish reserve through inadvertent removal of healthy ovarian tissue or compromised ovarian blood supply, particularly after bilateral or repeat surgery.[2]

Advances in oocyte and embryo vitrification have made fertility preservation (FP) an effective option for women at risk of premature ovarian reserve depletion. Current ESHRE and ASRM guidelines do not recommend routine FP for all women with endometriosis but advocate individualized counselling based on age, ovarian reserve, disease severity, previous ovarian surgery, and future reproductive plans, especially before bilateral or repeat ovarian surgery.[3,4]

This review summarizes current evidence on patient selection, timing, available strategies, counselling, and practical recommendations for fertility preservation in women with endometriosis.

1. Which women should be counselled regarding fertility preservation?

All reproductive-aged women with endometriosis should be informed about the potential impact of the disease and its treatment on future fertility.[2] Counselling is particularly recommended for women with:

- Bilateral or recurrent endometriomas
- Planned bilateral or repeat ovarian surgery
- Previous ovarian surgery
- Endometrioma in a single ovary
- Declining ovarian reserve
- Large unilateral endometrioma
- Planned delayed childbearing[5]

Routine FP is generally not recommended for women with minimal disease planning immediate conception or those with severely diminished ovarian reserve. Decisions should be individualized based on age, AMH, AFC, symptoms, previous surgery, and reproductive goals.

Table 1. Women who should be considered for fertility preservation

Strong candidates	Individualized consideration
■ Bilateral endometriomas ■ Recurrent endometrioma ■ Planned bilateral/repeat surgery ■ Endometrioma with single ovary ■ Previous ovarian surgery	■ Unilateral large endometrioma ■ Declining ovarian reserve ■ Delayed childbearing

2. Which women derive the greatest benefit from fertility preservation?

The greatest benefit is seen in women[6]:

- <35 years, owing to better oocyte quality and higher live birth rates in.
- Before ovarian surgery, when oocyte yield is significantly higher than after surgery.
- With normal ovarian reserve, who respond better to ovarian stimulation.

3. When should fertility preservation be performed?

Whenever possible, FP should be performed before bilateral or repeat ovarian surgery, as cystectomy can significantly reduce ovarian reserve, particularly after bilateral procedures.

Surgery before FP may still be appropriate when there is[7]:

- Suspicion of malignancy
- Severe pain requiring urgent surgery
- Endometrioma preventing safe oocyte retrieval and inaccessibility to follicles

Management should balance symptom control with fertility preservation.

4. What fertility preservation options are available for women with endometriosis?

Available options include oocyte cryopreservation, embryo cryopreservation, and ovarian tissue cryopreservation (OTC). The choice depends on the woman's age, ovarian reserve, reproductive plans, availability of partner, urgency of treatment and anticipated ovarian surgery.

OOCYTE CRYOPRESERVATION

Oocyte vitrification is the **preferred option** because of excellent survival rates (>90%), good reproductive outcomes, and preservation of reproductive autonomy. Cumulative live birth rates increase with the number of vitrified oocytes and are comparable to elective fertility preservation.[5]

EMBRYO CRYOPRESERVATION

An effective option for women with a committed partner, but it requires shared decision-making and may raise legal or ethical concerns if circumstances change.[8]

OVARIAN TISSUE CRYOPRESERVATION

OTC remains experimental in endometriosis. It may be considered only in highly selected women requiring urgent ovarian surgery when ovarian stimulation is not feasible. Evidence regarding reproductive outcomes remains limited.[7]

Table 2. Comparison of fertility preservation strategies in endometriosis

Strategy	Advantages	Limitations	Suitable candidates
Oocyte cryopreservation	Established, high survival after vitrification, no partner required	Requires ovarian stimulation	Preferred option for most women
Embryo cryopreservation	Excellent cumulative live birth rates	Requires partner or donor sperm	Women with stable reproductive plans
Ovarian tissue cryopreservation	No stimulation required, immediate surgery possible	Limited evidence in endometriosis	Highly selected women in expert centres

5. What information should be provided during fertility preservation counselling for women with endometriosis?

Counselling should cover:

- Available FP options
- Expected success rates
- Number of oocytes likely required
- Possible need for multiple stimulation cycles
- Risks, costs, and timing relative to surgery

Women should understand that FP improves the chance of future biological parenthood but does not guarantee a live birth.[3,4]

6. How should ovarian stimulation be performed for fertility preservation in women with endometriosis?

No ovarian stimulation protocol has proven superior in endometriosis. GnRH agonist, antagonist, and PPOS protocols produce comparable outcomes. Dienogest-based PPOS is a promising alternative that allows continued disease suppression during stimulation.[9]

7. How many oocytes should be cryopreserved?

The target should be individualized according to age and ovarian reserve.

- ≤35 years: approximately 10–15 mature oocytes
- >35 years: >20 mature oocytes may be required to maximize live birth chances.[10]

Women with previous ovarian surgery may require more than one stimulation cycle.

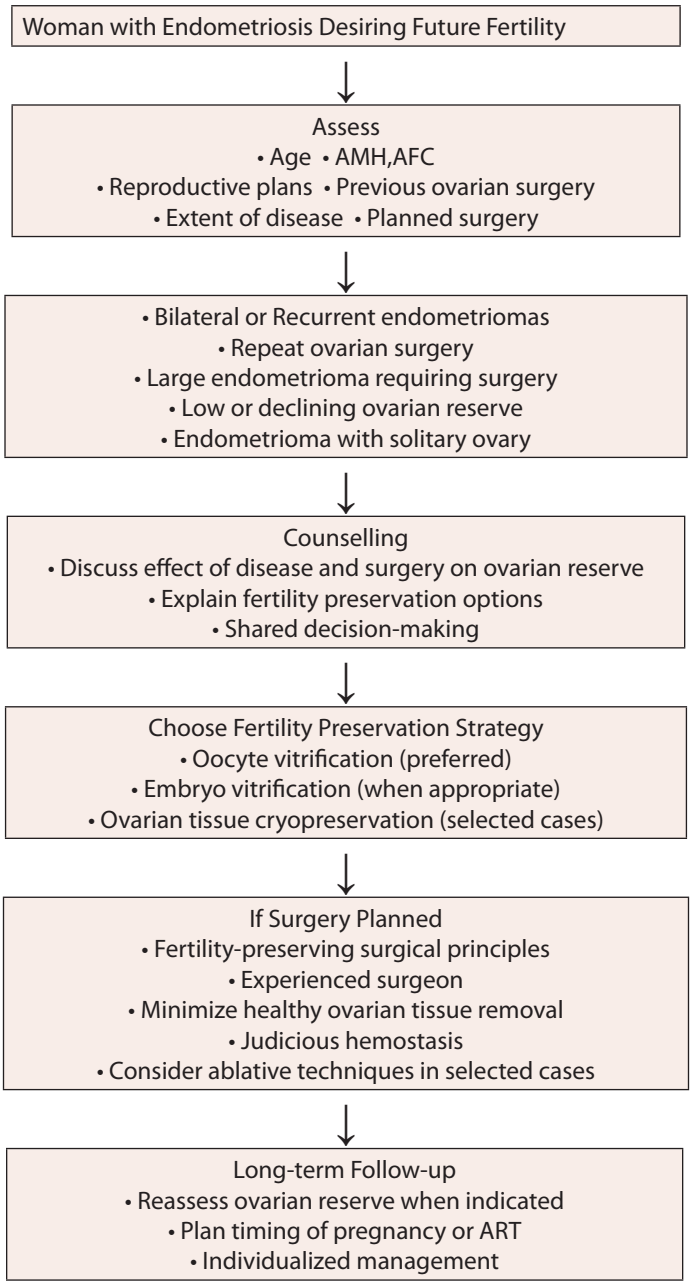
8. What are the future perspectives in fertility preservation for women with endometriosis?

Future advances include AI-based prediction models based on clinical, imaging, ovarian reserve, and surgical data to identify women at highest risk of fertility loss and optimize the time of fertility preservation. Novel ovarian-sparing surgical techniques and improved vitrification protocols are expected to further enhance reproductive outcomes. Experimental approaches such as 3D bioprinted ovarian scaffolds, ovarian tissue engineering and in vitro follicle maturation may expand future fertility preservation. However, these remain investigational, and current clinical practice should continue to follow evidence-based recommendations.[3]

9. What is the long-term follow-up strategy after fertility preservation in women with endometriosis?

Follow-up should include periodic reassessment of reproductive goals, ovarian reserve (AMH ± AFC), and disease status. Women should be counselled that FP does not prevent disease progression, and medical therapy may continue until pregnancy is desired. Decisions regarding use of cryopreserved oocytes/embryos should be individualized with multidisciplinary input.[3,4]

Flowchart: Fertility Preservation in Endometriosis



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Pain Management and Counselling in Endometriosis and Adenomyosis

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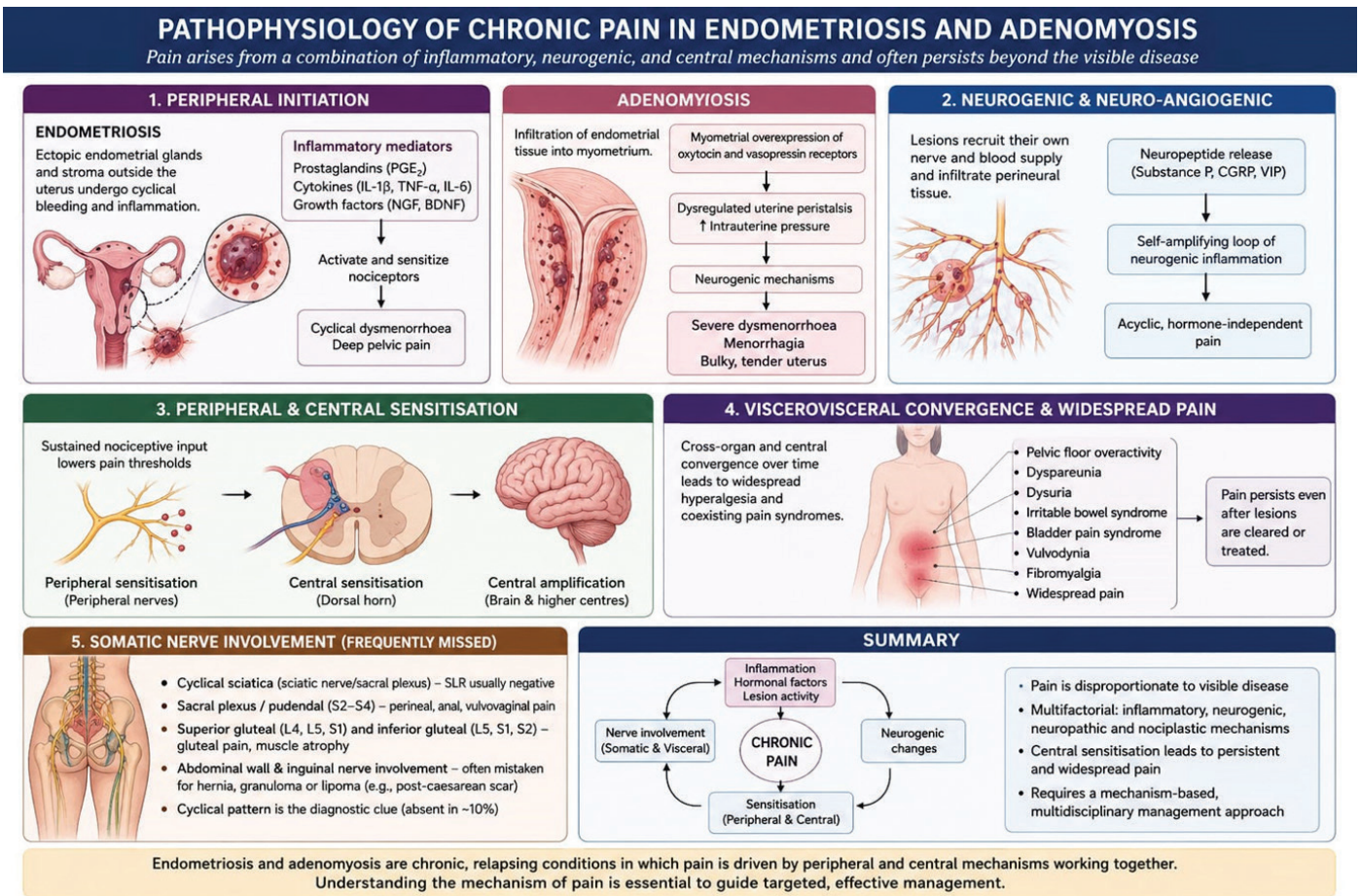
DISEASE BURDEN

Endometriosis and adenomyosis are best understood as related expressions of ectopic endometrial-type tissue. Endometriosis is the seeding of endometrial glands and stroma outside the uterus, whereas adenomyosis is due to the infiltration in uterine myometrium itself. The two conditions frequently coexist. For the anaesthesiologist, whether the patient is met in the pain clinic, labour ward or at pre-operative assessment, both pose the same core problem: a chronic, often centralised pain with clinical symptoms disproportionate to the visible disease.

MECHANISM OF PAIN (FIGURE-1)

Pain in these conditions evolves through overlapping stages rather than arising from a single source. Therefore, the mechanism of pain dictates the treatment.

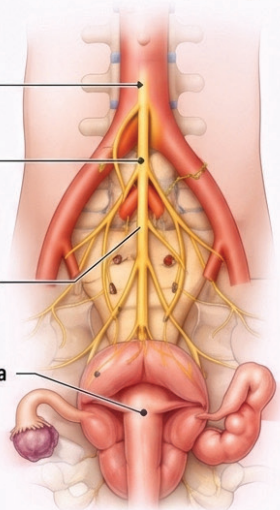
- **Inflammatory / nociceptive -** Ectopic tissue and its cyclical bleeding release prostaglandins, cytokines and growth factors that activate and sensitise local nerve endings leading to the classic cyclical dysmenorrhoea and deep pelvic pain.
- **Neurogenic and neuro-angiogenic -** Lesions recruit their own nerve and vascular supply and infiltrate perineural tissue; neuropeptide release then drives a self-amplifying loop capable of producing acyclic, hormone-independent pain.
- **Peripheral and central sensitisation -** Sustained nociceptive input lowers thresholds first in peripheral nerves, then in the dorsal horn and higher centres. This is why pain persists after lesions are cleared, and why it spreads beyond the pelvis.
- **Viscerovisceral convergence -** Over time many patients develop widespread hyperalgesia, pelvic floor overactivity, dyspareunia, dysuria, irritable bowel syndrome, bladder pain syndrome, vulvodynia or fibromyalgia through cross-organ and central convergence.[1-2]



INTERVENTIONS FOR THE MANAGEMENT OF REFRACTORY PAIN IN ENDOMETRIOSIS & ADENOMYOSIS

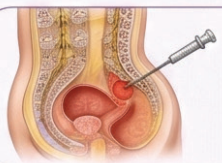
1. INTERVENTIONS TARGETING VISCERAL PAIN

The sympathetic nervous system plays a key role in the transmission and modulation of visceral nociceptive signals.



The SHP, situated anterior to the lower abdominal aorta near its bifurcation, provides sympathetic innervation to the hindgut (descending & sigmoid colon, proximal rectum) and pelvic viscera (uterus, ovaries, urinary bladder, prostate, testes, seminal vesicles).

- Targeting bilateral SHP can provide superior analgesia, improve functional outcomes & quality of life, and reduce need for prolonged opioid therapy.
- Better outcomes with: younger age (especially women), shorter duration of symptoms, lower pretreatment pain severity, and better psychological well-being (less anxiety & depression).



Ganglion impar block

Offers effective analgesia when perineum, vulva, rectum or anal canal is involved.

2. INTERVENTIONS TARGETING SOMATIC COMPONENT OF PAIN

Provide rapid analgesia with fewer complications than SHP block when performed correctly, but may not address visceral sources of pain. Usually act as an adjunct to sympathetic blocks, except when somatic pain is predominant.

A. NERVE BLOCKS AND NEUROLYSIS



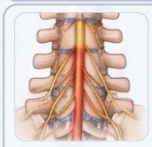
- Peripheral & abdominal-wall blocks (ilioinguinal, iliohypogastric, transversus abdominis plane block) for refractory abdominal wall & inguinal pain.



- Pelvic-floor botulinum toxin, and myofascial trigger-point release for muscular spasm.



- Ultrasound-guided hydrodissection of peripheral nerves with low-concentration dextrose for entrapment neuropathy to relieve chronic hypoxia and neurogenic inflammation. It dissects the endometrial tissues around the nerve area, mechanically decompressing the nerve.



- Lumbosacral radiculopathy can be treated with differential neural blockade at the dorsal cutaneous nerve branches of T11–S4, depending on the clinical presentation. Sciatic nerve block might be useful in patients with sciatic nerve involvement.

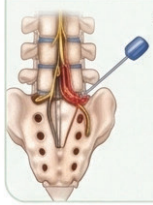


Buttock pain due to peripheral nerve involvement can be treated with sacral network, superior or inferior gluteal or cluneal nerve blocks.



- Genital pain in the distribution of the affected nerves can be treated with either or a combination of genitofemoral, lateral femoral cutaneous, pudendal or ilioinguinal nerve blocks.

B. NEUROMODULATION



- Pulsed radiofrequency of S3 dorsal root ganglion have shown some evidence in management of pelvic pain in conjunction with the SHP block.



- Spinal or sacral neuromodulation may be tried for selected refractory centralized cases.



- Intrathecal medications used to manage the pain include morphine, hydromorphone, fentanyl, bupivacaine, ropivacaine and clonidine being the most studied.

- Most commonly used drugs are a mixture of morphine 1 mg/mL and bupivacaine 2 to 3 mg/mL.



In adenomyosis, there is a disruption between the basal endometrium and myometrium due to the infiltration of myometrium by endometrial stroma and glands. The myometrial cells overexpress oxytocin receptors and increase responsiveness to oxytocin and vasopressin. This dysregulates uterine peristalsis and raises intrauterine pressure. This accompanied with the neurogenic mechanisms, lead to severe dysmenorrhoea, menorrhagia and a bulky, tender uterus.[3]

SOMATIC NERVE INVOLVEMENT AND SYMPTOMS IN ENDOMETRIOSIS

Somatic nerve involvement mimics musculoskeletal or radicular disease and is frequently missed for years. Recognisable patterns include:

- Cyclical sciatica due to the lesions involving sciatic nerve or sacral plexus. The straight-leg-raise is typically negative, which helps distinguish it from disc pathology.

- Sacral plexus / pudendal (S2–S4) involvement causing perineal, anal and vulvovaginal pain.
- Superior gluteal (L4, L5, S1) and inferior gluteal (L5, S1, S2) nerve involvement causing gluteal muscle atrophy.
- Abdominal wall and inguinal disease (frequently post-caesarean scar endometriosis) is usually mistaken for hernia, granuloma or lipoma.1

The cyclical pattern is the diagnostic clue, though around 10% of cases show no clear menstrual relationship.

CLINICAL ASSESSMENT AND DIAGNOSIS

Diagnosis rests on a careful menstrual and pain history, examination that explicitly includes the pelvic floor, and exclusion of organ dysfunction. Ultrasound and MRI localise deep infiltrating disease; MRI junctional-zone thickening is central to the adenomyosis diagnosis. On ultrasound, entrapment neuropathy may show nerve enlargement, loss of the fascicular ("honeycomb") pattern, hypo-echogenicity and increased perineural flow.[1]

Confirmatory diagnosis can be made only with laparoscopic biopsy.

MANAGEMENT

Since endometriosis and adenomyosis are complex diseases involving central sensitization and sympathetic mediation, the approach to treatment is not "find and excise the lesion", instead it is "identify and treat the pain mechanism."

Patients are managed using a multidisciplinary approach, focussed on biological as well as psychological component of pain.

1. **Non-pharmacological management** includes education, pelvic floor physiotherapy, graded exercise, adequate sleep, anti-inflammatory dietary patterns (modest evidence for mediterranean diet), transcutaneous electrical nerve stimulation and psychological therapies like cognitive behavioural therapy (CBT).2-3

COUNSELLING

Counselling is an integral part of pain management. It is important that patient understands that the disease is chronic and relapsing and hence it can be controlled rather than cured, so patients are not repeatedly disappointed. Central sensitisation should be explained in simple terms and pain is validated helping motivate engagement with physiotherapy and CBT. Before starting the patients on hormonal therapy or planning an intervention or surgery, all pros and cons should be stated to help make an informed decision.

It is important to address the mental and sexual health burden directly as it is substantial and often under-treated. Also, discussion about the fertility and planning conception need to be discussed to individualise treatment.

2. **Pharmacological management** consists of non-steroidal anti-inflammatory drug targeting the inflammatory component, with paracetamol as adjunct. Chronic opioids should be avoided in such patients, although intravenous infusion of opioids have shown to be effective in short term for breakthrough pain. Anti-depressants and antiepileptic medications like amitriptyline, duloxetine and gabapentinoids are modestly effective where a neuropathic or central component is evident.

   Hormonal therapy has been traditionally used to manage the symptoms. These include combined hormonal contraceptives, progestins (including the levonorgestrel-releasing intrauterine system, particularly useful in adenomyosis) and Gonadotropin releasing hormone (GnRH) agonists/antagonists to suppress cyclical activity.3 Recurrence is common after stopping medications, which is an essential counselling point.

3. **Interventions for the management of refractory pain** focuses on visceral as well as somatic pain and can improve the pain caused by endometriosis and adenomyosis by up to 90%. (Figure 2) Effective pain management is essential not only for symptom relief but also for preserving fertility potential and reducing the likelihood of long-term sequelae like adhesions.

Commonly performed interventions include:

1. **Interventions targeting visceral pain**

   The sympathetic nervous system plays a key role in the transmission and modulation of visceral nociceptive signals irrespective of the underlying pathology. The superior hypogastric plexus (SHP), situated anterior to the lower abdominal aorta near its bifurcation, provides sympathetic innervation to the hindgut, including the descending and sigmoid colon and proximal rectum as well as pelvic viscera such as the uterus, ovaries, urinary bladder, prostate, testes and seminal vesicles.

   Interventional targeting of bilateral SHP is therefore an important strategy for managing pain arising from these structures. It may provide superior analgesia, improve functional outcomes and quality of life, and decrease the need for prolonged opioid therapy.4

   Treatment outcomes appear to be influenced by several patient-related factors. Younger women, shorter duration of symptoms and lower pretreatment pain severity generally demonstrate more favourable responses to intervention. In addition, psychological well-being significantly affects treatment success, with lower levels of anxiety and depressive symptoms correlating with greater pain relief, emphasizing the need for a comprehensive biopsychosocial approach to chronic pain management.[5,6]

In addition, blockade of the ganglion impar offers effective analgesia when perineum, vulva, rectum or anal canal is involved.

2. **Interventions targeting somatic component of pain** give rapid analgesia with fewer complications than SHP Block (SHPB) when performed correctly but it may not address all sources of pelvic pain, especially those arising from visceral structures, which restricts its effectiveness compared to SHPB. Therefore, these usually act as an adjunct to the sympathetic blocks, except for patients where somatic pain is predominant.

A. Nerve blocks and neurolysis

- Peripheral and abdominal-wall blocks (ilioinguinal, iliohypogastric, transversus abdominis plane block) for refractory abdominal wall and inguinal pain.
- Pelvic-floor botulinum toxin, and myofascial trigger-point release for muscular spasm.
- Ultrasound-guided hydrodissection of peripheral nerves with low-concentration dextrose for entrapment neuropathy to relieve chronic hypoxia and neurogenic inflammation. It dissects the endometrial tissues around the nerve area, mechanically decompressing the nerve.
- Lumbosacral radiculopathy can be treated with differential neural blockade at the dorsal cutaneous nerve branches of T11- S4, depending on the clinical presentation. Sciatic nerve block might be useful in patients with sciatic nerve involvement.
- Buttock pain due to peripheral nerve involvement can be treated with sacral network, superior or inferior gluteal or cluneal nerve blocks.
- Genital pain in the distribution of the affected nerves can be treated with either or a combination of genitofemoral, lateral femoral cutaneous, pudendal or ilioinguinal nerve blocks.[1]

B. Neuromodulation

- Pulsed radiofrequency of S3 dorsal root ganglion have shown some evidence in management of pelvic pain in conjunction with the SHP block.1
- Spinal or sacral neuromodulation may be tried for selected refractory centralised cases.
- Intrathecal medications used to manage the pain include morphine, hydromorphone, fentanyl, bupivacaine, ropivacaine and clonidine being the most studied. Most commonly used drugs are a mixture of morphine 1 mg/mL and bupivacaine 2 to 3 mg/mL.[7]

4. Surgical

Laparoscopic surgery addresses structural contributors to chronic pelvic pain, including endometriosis and pelvic adhesions, thereby providing meaningful symptom relief and improving quality of life in appropriately selected patients. Despite its therapeutic benefits and favourable safety profile, laparoscopy remains associated with potential complications such as bleeding and infection, as well as increased healthcare costs related to operative care and postoperative recovery. Also, disease recurrence and persistent central pain must be anticipated and discussed in advance. Other approaches include uterine artery embolization or definitive hysterectomy.

CONCLUSION

Endometriosis and adenomyosis share a common pain biology that outgrows the visible lesion. Effective care matches treatment to mechanism, treats the condition as chronic rather than curable, integrates the pain physician early alongside gynaecology, and invests in counselling as seriously as in any intervention or drug.

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Current Guidelines Update: ESHRE Recommendations on Endometriosis

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INTRODUCTION

The European Society of Human Reproduction and Embryology (ESHRE) updated its endometriosis guideline in 2022, replacing the 2014 version and incorporating contemporary evidence on diagnosis, pain, infertility, recurrence, adolescence, menopause, and cancer risk.

OVERVIEW OF CHANGES TO THE GUIDELINE RECOMMENDATIONS AS COMPARED TO THE PREVIOUS VERSION

Overall, the updated guideline favours less invasive diagnosis, judicious surgery, evidence-based fertility management, and individualized long-term care.

1. **Diagnosis: A Shift Towards Non-Invasive Approaches:** One of the most important changes in the 2022 guideline is that laparoscopy is no longer considered the diagnostic gold standard for endometriosis. Instead, imaging modalities, particularly TVS and MRI, are recommended as first-line investigations.
2. **Management of Endometriosis-Associated Pain:** Inclusion of GnRH antagonists as second-line treatment options for women who fail to respond to conventional hormonal therapy. Similar to GnRH agonists, their use requires careful consideration of adverse effects and patient preferences. Add-back therapy is recommended with GnRH agonists to minimize hypoestrogenic symptoms and preserve bone density.
3. **Management of Endometriosis-Associated Infertility:** The Endometriosis Fertility Index (EFI) has been incorporated into clinical practice as an important tool to guide decision-making after surgery. The EFI helps identify women who may benefit from expectant management, further surgical intervention, or assisted reproductive technologies (ART). Its use represents a significant advancement toward individualized fertility care. Another important modification concerns the prolonged administration of GnRH agonists before ART. Earlier recommendations supporting ultralong protocols have been withdrawn.

Table 1. ESHRE 2022 Endometriosis Guidelines: Key Recommendations

Domain	ESHRE 2022 Recommendation	Grade
Diagnosis		
Diagnosis	• Laparoscopy is no longer diagnostic gold standard • Use ultrasound or MRI as first-line investigations; reserve laparoscopy for selected cases	GPP Strong
Biomarkers	Serum and tissue biomarkers are not recommended	Strong
Medical Management of pain		
First-line pain treatment	• Combined hormonal contraceptives and progestogens are recommended • For endometriosis-associated dysmenorrhea continuous use of a combined hormonal contraceptive pill can be offered • Progesterone depending on side effect profile either progesterone only pill, LNG-IUS or an etonogestrel-releasing subdermal implant can be prescribed	Strong Strong Strong
GnRH agonists	Recommended as second-line treatment with add-back therapy	Strong
GnRH antagonists	New second-line therapeutic option	Strong
Surgery for endometriosis associate pain		
Preoperative hormone treatment	Not recommended to improve the immediate outcome of surgery for pain.	Strong
Ovarian endometrioma surgery	Cystectomy is preferred over drainage and coagulation	Strong
Deep endometriosis	Management in specialized centres is recommended	GPP

Hysterectomy	• Can consider hysterectomy (with or without removal of the ovaries) with removal all visible endometriosis lesions, in those women who no longer wish to conceive and failed to respond to more conservative treatments. • Inform that hysterectomy will not necessarily cure symptoms or disease.	GPP GPP
Postoperative hormone treatment	Hormonal therapy should be considered in women not seeking immediate pregnancy	Strong
Medical Management of Endometriosis associate infertility		
Infertility management	Ovarian suppression should not be used solely to improve fertility	Strong
Post operative hormone suppression	• Women seeking pregnancy should not be prescribed postoperative hormone suppression to enhance future pregnancy rates. • Women delaying pregnancy immediately after surgery may be offered hormone therapy as it improves outcome of surgery and has no negative impact on fertility.	Strong Weak
Ultralong GnRH agonist protocols before ART	No longer routinely recommended	Strong
Surgical Management of Endometriosis associated infertility		
Operative laparoscopy for infertility	• Could be offered as for infertility in rASRM stage I/II endometriosis to improve rate of ongoing pregnancy. • Consider operative laparoscopy for infertility as it may increase their chance of natural pregnancy. • Operative laparoscopy for deep endometriosis improves fertility, and might be treatment option in symptomatic patients wishing to conceive.	Weak Weak Weak
EFI	Recommended after surgery	Strong
Surgery before ART	Not routinely recommended for ovarian endometriomas or deep disease	Strong
Fertility preservation	Discuss in women with extensive ovarian endometriosis	GPP
Medically assisted reproduction		
IUI with ovarian stimulation	• Increases pregnancy rate compared to expectant management in rASRM stage I/II endometriosis • Role uncertain but can be cosidered in rASRM stage III/IV endometriosis	Weak Weak
ART	Can be considered with other associated factors for infertility are present, low EFI and other treatments have failed	Weak
Protocol for ART	Both GnRH antagonist and agonist protocols can be offered, both has similar pregnancy and live birth rate.	Weak
Ovum pickup	May use antibiotic prophylaxis for OPU	Weak
Special Considerations		
Adolescents	Early recognition and hormonal therapy are first-line approaches	Strong
Menopause	Combined menopausal hormone therapy is preferred over estrogen-only therapy	GPP
Recurrence prevention	Long-term postoperative hormonal therapy is recommended	Strong
Cancer risk	Absolute risk of cancer remains low	Strong

Balancing Surgery and Fertility in Endometriosis: A Case-Based Discussion

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The management of endometriosis-associated infertility remains challenging. While surgery may alleviate pain, restore pelvic anatomy, and improve access to the ovaries, ovarian cystectomy carries a significant risk of reducing ovarian reserve, particularly in women with bilateral disease. Therefore, individualized treatment decisions balancing symptom relief, fertility preservation, and assisted reproductive outcomes are essential. Current international guidelines advocate a multidisciplinary, patient-centered approach, integrating clinical assessment, imaging, reproductive goals, and ovarian reserve before deciding on surgical intervention.

CASE REPORT

History: A 26-year-old nulliparous woman, married for the past 3 years, presented to the gynecology outpatient department with complaints of inability to conceive for the last 1 year. She also reported lower abdominal pain of insidious onset that had progressively increased in severity over the past 2 years, particularly during menstruation requiring frequent analgesics and bed rest. Over the preceding 6 months, she developed pain during defecation and deep dyspareunia, leading to avoidance of sexual intercourse. She also complained of occasional constipation. She had been on oral dienogest therapy for the previous 6 months. Her menstrual cycles were otherwise regular, with average menstrual flow.

Examination: Vitals- stable. General examination unremarkable. Per abdominal and per speculum examination were normal. Per vaginal examination revealed a retroverted, normal-sized uterus with restricted mobility and bilateral forniceal tenderness.

QUESTIONS FOR DISCUSSION

Q1. How will you approach this case?

Although the patient presents with typical features of deep infiltrating endometriosis, differential diagnosis includes Irritable bowel syndrome/bowel pathology, adenomyosis and chronic pelvic inflammatory disease which requires further evaluation. The GDG of ESHRE recommends that clinicians should consider the diagnosis of endometriosis in individuals presenting with cyclical and non-cyclical signs and symptoms of dysmenorrhea, deep dyspareunia, dysuria, dyschezia, painful rectal bleeding or haematuria, shoulder tip pain, catamenial pneumothorax, cyclical cough/ haemoptysis/chest pain, cyclical scar swelling and pain, fatigue, and infertility.

Vaginal examination should be considered to identify deep nodules or endometriomas in patients with suspected endometriosis, although the diagnostic accuracy is low. Further diagnostic steps, including imaging, should be considered even if the clinical examination is normal.

After considering a presumptive diagnosis of endometriosis, the option of further diagnostic confirmation or (empirical) treatment should be discussed. Patient preference is a relevant issue to be considered here. In this respect, diagnosis of certain presentations of endometriosis for example ovarian endometrioma and deep disease by ultrasound or MRI can be considered without laparoscopy and histological confirmation.

CASE SUMMARY CONTINUED...

Investigations: Ultrasonography demonstrated bilateral ovarian endometriomas (6 × 3 × 5.5 cm and 6 × 3 cm) with inaccessible follicles despite antral follicle count(AFC) of 13 on each side. The ovarian lesion on the left side had atypical features of papillary projections with ground glass internal echoes but no increased vascularity which warranted higher imaging. MRI showed bilateral endometriomas with mild posterior rectal tethering suggestive of superficial deep infiltrating endometriosis without bowel invasion. Serum AMH was 6.4 ng/mL, while CA-125 and CA 19-9 were elevated at **179.7 U/mL** and **146.6 U/mL,** respectively.

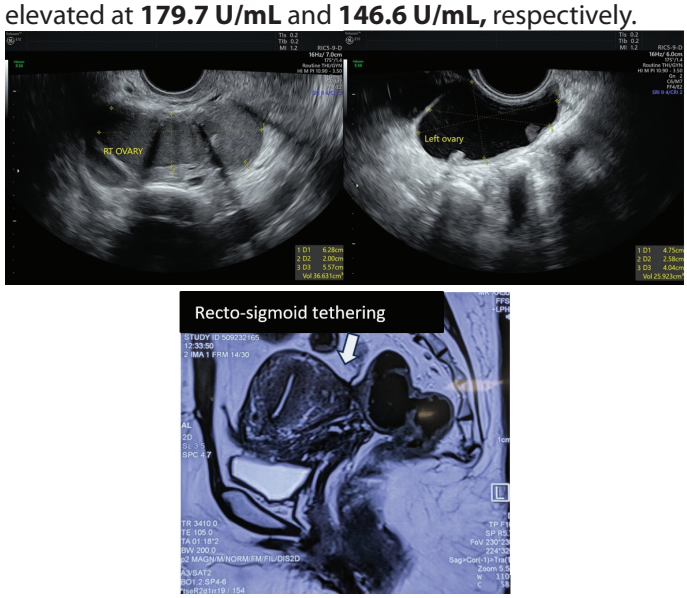


Image 1: Pre-operative imaging

Q3: What is the role of Imaging

Diagnostic laparoscopy had long been considered the gold standard for the diagnosis of endometriosis. The 2022 updated endometriosis guidelines from the European Society for Human Reproduction and Embryology guidelines now recommend imaging, both ultrasound and MRI, be used as a front-line diagnostic test. It is important to be aware however that negative imaging does not exclude endometriosis (especially the superficial form of the disease) and those with negative imaging and a strong clinical suspicion of endometriosis should be consider laparoscopy for both diagnosis and excision of endometriosis.

Q4: What are the indications of surgery for endometriosis in a woman desiring fertility?

- Severe or persistent endometriosis-associated pain refractory to conservative or medical management.
- To facilitate assisted reproduction when large endometriomas impair transvaginal access to follicles during oocyte retrieval.
- Suspicion of malignancy or atypical imaging features, such as papillary projections or complex cyst morphology, requiring histopathological evaluation.
- Symptomatic deep infiltrating endometriosis involving the bowel, bladder, or ureters, where surgery is indicated primarily for symptom control rather than fertility enhancement.
- Individualized decision-making based on patient preferences, age, ovarian reserve, previous pelvic surgery, estimated Endometriosis Fertility Index (EFI), associated infertility factors, contraindications or intolerance to medical therapy, and resource availability.

Current recommendations

- Routine surgical excision of ovarian endometriomas before ART is not recommended solely to improve live birth rates, as current evidence shows no reproductive benefit and surgery may further compromise ovarian reserve.
- Excision of deep infiltrating endometriosis before ART should not be performed routinely to improve fertility. The decision should be guided primarily by pain severity, anatomical distortion, and patient preference, as evidence demonstrating improved reproductive outcomes remains insufficient.
- Women should be counselled regarding the possibility of postoperative decline in ovarian reserve and fertility preservation strategies before bilateral cystectomy.

CASE SUMMARY CONTINUED…

Procedure: She underwent diagnostic laparoscopy, hysteroscopy, bilateral ovarian cystectomy, and chromopertubation. Intraoperatively, a 3x3cm right ovarian endometriotic cyst and an 8x7cm multiloculated left ovarian cyst with papillary excrescences were identified; Chromopertubation demonstrated bilateral tubal occlusion, while hysteroscopy revealed a normal uterine cavity. The operative findings were consistent with severe endometriosis, with bilateral ovarian endometriomas, significant tubo-ovarian distortion, and bilateral tubal occlusion - rASRM Stage IV (severe) endometriosis. Postoperative period was uneventful, and the patient received a single dose of subcutaneous leuprolide acetate 3.75 mg, while waiting for IVF. Histopathological examination was suggestive of a **right ovarian endometriotic cyst** and a **left ovarian serous cystadenoma**. These findings would be expected to result in a low Endometriosis Fertility Index (EFI), supporting the decision to proceed with IVF.

Q5. What is the role of post-operative GnRH agonist in the patient?

According to the ESHRE 2022 Guideline Development Group (GDG), women who are unable to attempt conception immediately after surgery or who choose to delay pregnancy may be offered postoperative hormonal therapy, as it improves pain control without adversely affecting future fertility.

In women requiring assisted reproductive techniques, such as the present patient with bilateral tubal occlusion, postoperative GnRH agonist therapy serves as a bridge to ART by suppressing residual endometriotic implants, reducing disease activity, and decreasing the risk of early symptom recurrence while awaiting fertility treatment.

Current recommendation

GnRH agonist is not recommended post surgery in a woman directly going for IVF.

Reproductive outcome: Post-operatively AMH declined to 3.66 ng/mL after 6 weeks with a total AFC of 15. Controlled ovarian stimulation was performed using a GnRH antagonist protocol with recombinant FSH 300 IU daily for 10 days, followed by a dual trigger with injection leuprolide and recombinant HCG. Three oocytes were retrieved, of which one metaphase II oocyte fertilized and developed into a Day-5, 3BB embryo, which was vitrified.

Downregulated-FET was selected because prolonged pituitary suppression may reduce residual inflammatory activity and optimize endometrial receptivity in selected women with moderate-to-severe endometriosis. A downregulated frozen embryo transfer cycle using depot leuprolide acetate followed by estradiol valerate resulted in a successful singleton pregnancy. She underwent induction of labor with cervigel at 39 weeks and delivered a healthy 2.8-kg male infant by uncomplicated vaginal delivery.

Q6. What is the effect of endometriosis surgery on ovarian reserve?

Both endometriosis and its surgical treatment can adversely affect ovarian reserve. Endometriomas are associated with chronic inflammation, oxidative stress, fibrosis, and compression of the surrounding ovarian cortex, resulting in accelerated follicular loss even before surgical intervention. Although laparoscopic cystectomy remains the preferred treatment for symptomatic endometriomas, particularly for pain relief and histopathological confirmation, it may further compromise ovarian reserve.

The decline in ovarian reserve following cystectomy is multifactorial. During excision, the cleavage plane between the cyst wall and normal ovarian cortex is often indistinct, leading to inadvertent removal of healthy ovarian tissue containing primordial follicles. In addition, haemostasis using bipolar coagulation may cause thermal injury to the residual ovarian cortex, further reducing follicular density. The detrimental effect is more pronounced in women with bilateral endometriomas, large cysts, recurrent disease, or previous ovarian surgery.

Serum anti-Müllerian hormone (AMH) typically declines immediately after surgery and, although partial recovery may occur over subsequent months, postoperative levels often remain significantly lower than baseline. In the present case, AMH decreased from 6.4 ng/mL preoperatively to 3.66 ng/mL six weeks after bilateral cystectomy, accompanied by a reduction in total AFC from 26 to 15, illustrating the impact of surgery on ovarian reserve.

Women undergoing surgery for endometriomas, particularly bilateral cystectomy, should be counselled preoperatively regarding the potential reduction in ovarian reserve, its implications for future fertility, and the possible need for timely fertility preservation or assisted reproductive treatment.

Q7: What are the indications for Medically Assisted Reproduction (MAR)?

- Individuals with endometriosis who desire pregnancy should receive individualized counselling regarding their expected fertility outcomes, both before and after surgical treatment. The Endometriosis Fertility Index (EFI) is a validated, reproducible, and cost-effective scoring system to estimate the likelihood of spontaneous pregnancy.
- Medically assisted reproduction (MAR) is recommended in women with endometriosis-associated infertility, particularly in the presence of:
    - Compromised tubal function or tubal occlusion.
    - Concomitant male factor infertility.
    - A low Endometriosis Fertility Index (EFI) score.
    - Failure to conceive despite expectant management, surgery, or other fertility treatments.
- The choice of ART should be individualized based on the patient's age, ovarian reserve, reproductive goals, and other infertility factors. (1)treatments for pain and infertility, management of disease recurrence, asymptomatic or extrapelvic disease, endometriosis in adolescents and postmenopausal women, prevention and the association with cancer.\nWHAT IS KNOWN ALREADY: Endometriosis is a chronic condition with a plethora of presentations in terms of not only the occurrence of lesions, but also the presence of signs and symptoms. The most important symptoms include pain and infertility.\nSTUDY DESIGN SIZE DURATION: The guideline was developed according to the structured methodology for development of ESHRE guidelines. After formulation of key questions by a group of experts, literature searches and assessments were performed. Papers published up to 1 December 2020 and written in English were included in the literature review.\nPARTICIPANTS/MATERIALS SETTING METHODS: Based on the collected evidence, recommendations were formulated and discussed within specialist subgroups and then presented to the core guideline development group (GDG
- In our patient, the presence of rASRM Stage IV disease, bilateral tubal occlusion, and the anticipated low Endometriosis Fertility Index (EFI) favored early transition to IVF rather than expectant management.

Q8: What are the effects of endometriosis on IVF outcomes?

- Both GnRH antagonist and GnRH agonist protocols may be used for ovarian stimulation, as neither has demonstrated superiority in terms of clinical pregnancy or live birth rates. The choice of protocol should therefore be individualized based on patient and clinician preference.
- Women with endometriosis, particularly those with ovarian endometriomas or previous ovarian surgery, generally have fewer oocytes retrieved, higher gonadotropin requirements, and a higher cycle cancellation rate. However, these factors do not appear to adversely affect clinical pregnancy or live birth rates when compared with women undergoing IVF for other indications.
- Routine surgical excision of endometriomas prior to IVF is not recommended solely to improve ART outcomes, as it has not been shown to increase live birth rates and may further compromise ovarian reserve.
- In women with ovarian endometriomas, prophylactic

antibiotics are given at the time of oocyte retrieval, although the incidence of pelvic or ovarian abscess following follicular aspiration remains low.

In selected patients, particularly those with moderate-to-severe disease, downregulated frozen embryo transfer (DR-FET) using a GnRH agonist before endometrial preparation may improve endometrial receptivity by suppressing residual endometriotic activity.

However, current evidence is insufficient to recommend prolonged GnRH agonist pretreatment routinely for all women with endometriosis undergoing ART, and treatment should be individualized based on disease severity and clinical circumstances.

Q9: What are the effects of pregnancy on endometriosis?

- Pregnancy should not be recommended as a treatment for endometriosis. Although the high progesterone milieu of pregnancy induces a pseudo-pregnancy state, current evidence does not support pregnancy as a cure, and women should not be advised to conceive solely for symptom relief.
- The behaviour of endometriotic lesions during pregnancy is variable and may include regression, stability, or progression. Histological changes may include decidualization, atrophy, fibrosis, or necrosis.
- Decidualized endometriomas may mimic ovarian malignancy on imaging because of the development of solid or papillary components, creating a diagnostic challenge.
- Women with suspected decidualized endometriomas should be referred to a tertiary care centre. In the absence of concerning features, serial ultrasonography (with MRI if required) and expectant management are recommended. If surgery is indicated because of suspicion of malignancy or complications, a minimally invasive laparoscopic approach before 23 weeks of gestation is preferred and should be performed in an experienced tertiary centre.

Q10: What are the effects of endometriosis on pregnancy?

Although most women with endometriosis have successful pregnancies, the disease has been associated with an increased risk of certain obstetric complications. The absolute risk remains low, and current evidence does not support discouraging pregnancy or recommending additional antenatal surveillance solely on the basis of endometriosis.

COMPLICATIONS DURING PREGNANCY

- Endometrioma-related complications, including infection, torsion, and rupture, are uncommon but should be considered in pregnant women presenting with acute pelvic pain. Conservative management is preferred whenever feasible, although surgery may be required in cases of acute abdomen.
- Spontaneous intestinal perforation is a rare but life-threatening complication, possibly resulting from decidualization of bowel endometriotic lesions or traction on dense pelvic adhesions, and requires urgent surgical intervention.
- Spontaneous haemoperitoneum in pregnancy (SHiP) is another rare but serious complication caused by rupture of endometriotic implants or pelvic vessels, most commonly during the third trimester or within 42 days postpartum, and is associated with significant maternal and perinatal morbidity.

OBSTETRIC OUTCOMES

- **First trimester:** Increased risk of miscarriage and ectopic pregnancy has been reported.
- **Second and third trimesters:** Observational studies suggest an increased risk of preterm premature rupture of membranes (PPROM), preterm birth, placenta previa, fetal growth restriction/small-for-gestational-age infants, stillbirth, and caesarean delivery. However, the available evidence is of low to moderate quality, and causality has not been firmly established.
- Current guidelines do not recommend additional antenatal monitoring or advise women against pregnancy solely because of endometriosis. Obstetric care should be individualized based on the patient's clinical condition and coexisting risk factors.

CONCLUSION

This case illustrates the complexity of managing endometriosis-associated infertility, where symptom control, preservation of ovarian reserve, and optimization of reproductive outcomes must be carefully balanced. It also highlights the importance of meticulous preoperative imaging, individualized surgical decision-making, histopathological confirmation of atypical ovarian lesions, and timely transition to assisted reproduction. Despite bilateral ovarian surgery and a substantial reduction in ovarian reserve, successful live birth was achieved through individualized IVF management, underscoring the importance of proper care and timely ART.

HER Story… HER Words…

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1. **When did u first notice something was wrong and what made you finally see a doctor?**

   My journey began in 2019 when I suddenly developed severe stomach pain while I was at work. The pain was so intense that I could barely continue with my day. Initially, I was treated for a stomach infection, but despite taking medications, my symptoms did not improve. As the pain continued, I decided to consult a gynaecologist. An ultrasound was performed, and that was the first time I was told that I had an ovarian cyst related to endometriosis. Looking back, that ultrasound became the turning point in my journey.

2. **What did the Doctor say about your endometriosis and it's impact on fertility.**

   In the beginning, I visited several doctors, but I often came away with more questions than answers. Most consultations focused on removing the cyst in my left ovary and advised me to plan a pregnancy as soon as possible. Since I had only recently gotten married, I was not mentally or emotionally prepared to start a family immediately, and this advice left me feeling confused and pressured. was never given a complete picture of how endometriosis could progress, recur, or affect my fertility in the future. I wish I had received more comprehensive counselling at that stage so I could have made more informed decisions about my reproductive health.

3. **Did you hear about endometriosis before diagnosis?**
   No, I had never heard about endometriosis before I was diagnosed. Like many women, I assumed severe menstrual pain was something that had to be tolerated. I had no idea that such pain could be a symptom of a disease that can have a significant impact on fertility and quality of life. It was only after my diagnosis that I began reading about the condition and realised how little awareness exists, even among educated women. I often wonder whether my journey would have been very different if I had known about endometriosis earlier.

4. **What were your concerns?**

   My biggest concern has always been the unbearable pain. There were several occasions when the pain became so severe that I had to be admitted to the emergency department. It affected every aspect of my life—my work, my daily routine, my social life, and my emotional well-being. Alongside the pain was the constant worry about my future fertility. I was anxious about whether I would ever be able to conceive and whether every delay in treatment would reduce my chances of becoming a mother. Living with both physical pain and uncertainty was emotionally exhausting.

5. **Were you provided enough information about your condition**

   Unfortunately, no. When I finally started planning for pregnancy and consulted multiple specialists, I realised that I still did not fully understand my disease or the best treatment options available. I often felt that I was not being given enough information about my condition, the available treatment pathways, or what to realistically expect in the future. I also realised that not every ultrasound centre was equally equipped to diagnose endometriosis accurately, which sometimes added to the confusion. Eventually, when I was not satisfied with the guidance I was receiving, I decided to seek another opinion at AIIMS. That decision proved to be one of the most important steps in my journey because, for the first time, I felt that my concerns were heard and my treatment was planned with a clear understanding of my condition.

6. **What was the most difficult part of your journey?**

   The most difficult part was living with relentless pain. There were days when even carrying out simple daily activities became difficult. The second major challenge was undergoing IVF treatment while simultaneously balancing hospital visits, procedures, medications, and work responsibilities was physically and emotionally draining. Another aspect that people rarely talk about is the emotional burden of keeping the struggle private. As a couple, we often found it difficult to explain our situation to family members because infertility and endometriosis are still poorly understood in our society. The journey brought immense physical suffering, emotional distress, mental fatigue, and financial strain. There were times when it felt overwhelming, but we continued to move forward with hope.

7. **What would you say to women who are trying to conceive or has just received a diagnosis like you?**

   My biggest advice would be to find the right doctor and an experienced radiologist who truly understand endometriosis. Do not rush into treatment until you feel confident that your concerns have been heard and your diagnosis is accurate. Every woman with endometriosis is different, and treatment should never be a one-size-fits-all approach. Ask questions, seek information, and educate yourself about your condition. Do not ignore your pain or allow anyone to dismiss it as "normal." Most importantly, if you are not satisfied, do not hesitate to seek a second opinion.

   When you finally find a doctor who listens to you, explains things honestly, and inspires confidence—as I was fortunate to find—trust them and work together through the journey. Endometriosis can be a long and challenging road, but with the right guidance, timely treatment, and hope, it is possible to move forward towards your dream of motherhood.

Patient Information Leaflet

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What is Endometriosis (Chocolate cyst)?

A condition where the lining of uterus (womb) called endometrium is present in other locations in the body such as, but not limited to, the ovaries, bowel and bladder. It is a common condition that can affect up to 1/10 women and can be found in between 3-5/10 women with difficulty in conceiving.

What are the symptoms of endometriosis?

- Painful periods, heavy periods
- Pain while defeacation or passing urine,
- Pain during sexual intercourse
- Difficulty in conceiving.
- A proportion of these women with endometriosis remain asymptomatic also.

Not everyone with endometriosis experiences infertility or difficulty in conceiving. However, the condition can affect fertility by:

- Distorting the pelvic anatomy
- Damaging the ovaries and reducing ovarian reserve (number of eggs).
- Affecting the quality of eggs.
- Altering the pelvic environment through inflammation.
- Interfering with fertilization and embryo implantation (attachment of embryo to the uterus).

What causes endometriosis?

Most widely accepted theory- retrograde menstruation, where menstrual blood containing endometrial-like cells flows backward through the fallopian tubes. These cells may attach to the lining of the pelvis and grow into endometriotic lesions.

Does endometriosis affect my uterus?

While endometriosis is characterized by the presence of endometrial-like tissue outside the uterus, adenomyosis is a condition where endometrium is present within the walls of the uterus. Adenomyosis and endometriosis frequently occur together and may contribute to symptoms.

What is the cure for endometriosis?

The disease process and symptoms are managed and can be suppressed with timely diagnosis and correct treatment.

What is the treatment for endometriosis related pain?

Depends on your symptoms, age, and whether you are planning a pregnancy or not .

1) Pain-relieving medications (Analgesics) These medicines work best when taken at the onset of pain or just before your menstrual period begins.
2) **Hormonal treatment:** Hormonal medications reduce or suppress the effects of estrogen, slowing the growth and activity of endometriotic lesions. They are suitable for women who are not trying to conceive. Options are oral hormonal tablets, injections or implants. The choice will be decided by tour treating doctor after full consideration of your profile.

These treatments help reduce pain but do not permanently cure endometriosis. Symptoms may return after treatment is stopped.

3) **Surgery**

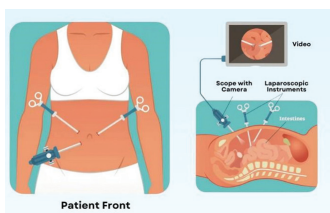
Keyhole surgery (laparoscopy or robotic) surgery may be recommended if:

- Pain is severe or persistent despite medication.
- Large ovarian endometriomas or chocolate cysts are present.
- Associated infertility



Surgery aims to remove or destroy endometriotic lesions and adhesions, relieve pain, and restore normal pelvic anatomy whenever possible.

Is surgery needed before IVF?



Not every woman requires surgery before IVF. Surgery is considered only in specific situations, such as severe pain, large ovarian cysts causing difficulty during egg retrieval, or in rare cases when your doctor has suspicion of cancer. Your fertility specialist will discuss the potential benefits and risks of surgery and help you decide the most appropriate approach for your individual situation.

Can Endometriosis Return After surgery?

Symptoms may recur in approximately 20–40% of women within 5 years after surgery and up to 50% within 10 years. This depends upon your age, severity of disease, post-surgery medical treatment.

- For women planning pregnancy, attempting conception soon after treatment or proceeding with assisted reproductive treatment may be recommended, based on individual factors and fertility goals.
- If you are not planning pregnancy, it is advisable to be on hormonal treatment after surgery to reduce chances of recurrence. Hormonal treatment after surgery can reduce the risk of symptom recurrence in women who are not trying to conceive.

What are my chances of natural conception?

Yes, some women with endometriosis are able to conceive naturally. If you have regular menstrual cycles (indicating regular ovulation), healthy fallopian tubes, mild disease, and no other factor affecting fertility, your chances of natural conception are good. Overall, 60–70% of women with endometriosis conceive naturally and go on to have healthy pregnancies.

However, the likelihood of pregnancy depends on the severity of the disease. Women with untreated mild endometriosis have a natural conception rate of approximately 2–4.5% per month, compared with 15–20% per month in couples without fertility problems. In women with moderate to severe endometriosis, the monthly chance of spontaneous conception is generally less than 2%. If pregnancy does not occur after an appropriate period of trying, further fertility evaluation or treatment based on your age, ovarian reserve, and individual circumstances is recommended.

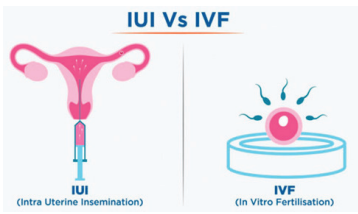
Any role of Intrauterine Insemination (IUI)?

Specially prepared sperm is placed directly into the uterus around the time of ovulation. IUI may be considered in selected women with minimal or mild endometriosis, provided the fallopian tubes are patent and the sperm quality is normal. It is generally not recommended for moderate or severe endometriosis.

When is IVF recommended?

IVF (In Vitro Fertilization) may be recommended if:

- Pregnancy has not occurred despite trying naturally.
- Blocked/damaged fallopian tubes.
- Moderate to severe endometriosis
- Unsuccessful previous fertility treatments



- Additional fertility factors such as male factor or reduced ovarian reserve.

IVF helps by collecting eggs directly from the ovaries, fertilizing them with sperm in a dish in the laboratory, and transferring the resulting embryo into the uterus.

Will Endometriosis Affect My IVF Success?

Many women with endometriosis achieve successful pregnancies through IVF. Success rates depend on several factors, including your age, ovarian reserve (egg quantity and quality), severity of endometriosis, previous ovarian surgery, overall health and sperm quality. Your doctor will discuss your individual chances of success.

What all tests should be done before IVF?

- Ultrasound or MRI (in selected cases) to assess ovarian cysts (endometriomas/chocolate cysts) and your ovarian reserve.
- Blood tests, including Anti-Müllerian Hormone (AMH), to further evaluate ovarian reserve.
- Semen analysis for your partner.

What Happens During IVF?

IVF is usually a 15-25 days process which includes stimulating your ovaries (with injections to encourage multiple eggs to mature); frequent scans to monitor the response; retrieving mature eggs under anaesthesia; then fertilising them with sperms in laboratory.

When my embryos will be put back into my womb?

Either in same cycle or later on. This will be decided as per number of quality of embryos, your disease status, uterine lining. Your doctor will discuss all the suitable options with you and will help you to decide for the same.

Are There Any Special Considerations in Women with Endometriosis during IVF process?

During the process of IVF, women with endometriosis may:

- May require higher doses of fertility medications.
- May produce fewer eggs if ovarian reserve is reduced.
- Have ovarian endometriomas that require careful monitoring.
- Experience a slightly more challenging egg retrieval due to pelvic adhesions.
- Patients with endometrioma are at risk of developing pus and infection in the ovary (ovarian abscess) and therefore, they need antibiotic coverage before and after egg retrieval.

When Should I Contact My Doctor Immediately after egg retrieval?

- Severe abdominal pain.
- Heavy vaginal bleeding.

- Fever above 38°C.
- Difficulty breathing.
- Persistent vomiting.
- Rapid abdominal swelling.
- Reduced urine output after egg retrieval.



What is the role of elective egg-freezing?

- Fertility Preservation: Women with endometriosis, particularly those with disease in both ovaries, or those requiring ovarian surgery for pain or those at risk of reduced ovarian reserve due to extensive disease, may consider freezing eggs or embryos to preserve future fertility.

FREQUENTLY ASKED QUESTIONS

Can IVF cure endometriosis?

No. IVF helps achieve pregnancy but does not treat the underlying disease.

Will pregnancy cure endometriosis?

No. Pregnancy may temporarily reduce symptoms, but endometriosis can recur after delivery.

Will I need more than one IVF cycle?

Some women conceive after the first cycle, while others may require multiple attempts. Your treatment plan will be individualized.

FORTHCOMING EVENT

- Laparoscopic Video workshop organized by VMMC & SJH on 08.08.26 under aegis of FOSGI & AOGD endoscopy subcommittee
- FOGSI Reach CME on PMOS on 12.08.26 under the aegis of AOGD & FOGSI at Hotel Hyatt

KNOW YOUR DRUG

Relugolix: An Emerging Oral GnRH Antagonist in Contemporary Gynaecology

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INTRODUCTION

Oral gonadotropin-releasing hormone (GnRH) antagonists have transformed management of estrogen-dependent gynaecological disorders. Relugolix, a novel non-peptide GnRH receptor antagonist, directly blocks pituitary GnRH receptors, producing rapid, reversible suppression of LH and FSH without the initial flare seen with GnRH agonists, enabling prompt control of fibroids, endometriosis, and adenomyosis.

Efficacy and safety have been established in large multicentre trials. The LIBERTY studies showed sustained reduction in fibroid-associated heavy menstrual bleeding with favourable bone safety to 104 weeks, while the SPIRIT programme demonstrated meaningful improvement in endometriosis-related pain with minimal bone loss.

DRUG OVERVIEW AND REGULATORY APPROVAL

A small non-peptide molecule taken orally once daily, relugolix offers rapid onset, no flare phenomenon, and a favourable safety profile. It is approved for moderate-to-severe endometriosis-associated pain and fibroid-associated HMB.[1]

The development timeline is summarised in Figure 1.

2004	→	2010	→	2018	→	2020	→	2024
Phase I trial initiated		Phase II in uterine fibroids		US FDA approval (endometriosis)		US FDA approval (fibroids)		DCGI approval (India)

Figure 1. Relugolix development timeline

MECHANISM OF ACTION

Relugolix competitively blocks pituitary GnRH receptors, reducing LH and FSH secretion, suppressing ovarian steroidogenesis and lowering circulating estradiol, leading to regression of estrogen-dependent disease (Figure 2).[1] Monotherapy, however, causes hypo-oestrogenism with bone loss and vasomotor symptoms (VMS).

GnRH receptor blockade (pituitary)	→	↓ LH & FSH secretion	→	↓ Ovarian estradiol	→	Regression of estrogen-dependent disease

Figure 2. Mechanism of action of relugolix

The estrogen threshold hypothesis holds that maintaining estradiol at 20–50 pg/mL suppresses disease growth while minimising bone loss and VMS (Table 1), forming the basis of add-back therapy.[1]

Table 1. The estrogen threshold and its effects

Estradiol level	Effect on fibroid	Vasomotor symptoms	Effect on bone
< 20 pg/mL	↓ MBL; improved anaemia, pain	Increased hot flushes	Increased BMD loss
20–50 pg/mL	↓ MBL; improved anaemia, pain	Minimised hot flushes	BMD preserved
> 50–60 pg/mL	Increased fibroid growth	—	—

The components of the fixed-dose tablet of the Relugolix combination therapy (RCT) and their role is summarized in (Table 2)

Table 2. Composition of relugolix combination therapy

Component	Role
Relugolix 40 mg	Oral, non-peptide, highly selective GnRH receptor antagonist
Estradiol hemihydrate 1 mg	Maintains therapeutic estradiol levels; reduces hypo-oestrogenic symptoms
Norethindrone acetate 0.5 mg	Second-generation progestin; prevents endometrial hyperplasia

PHARMACOKINETICS, DOSAGE AND ADMINISTRATION

One tablet is taken once daily, with or without food, within seven days of menses onset. Peak concentration occurs at 2–3 hours; half-life is 35–65 hours, supporting once-daily dosing with steady state by 10–14 days. It is highly protein bound, metabolised via CYP3A, and excreted mainly in faeces. Pregnancy must be excluded and contraceptives stopped before initiation; duration is up to 24 months.

SAFETY, ADVERSE EFFECTS AND CONTRAINDICATIONS

Common adverse effects include hot flushes, headache, mood changes, fatigue, irregular bleeding, and nausea. Therapy is contraindicated in high thromboembolic risk, pregnancy, hormone-dependent malignancy, osteoporosis, significant hepatic impairment, undiagnosed abnormal uterine bleeding, or hypersensitivity to any component.[1] Individualised monitoring is advised where risk exists.

CLINICAL EVIDENCE: UTERINE FIBROIDS

In fibroid-associated HMB, bleeding reflects endometrial surface changes, disrupted contractility, and altered angiogenesis, supporting ovarian steroid suppression. Across the LIBERTY programme (Table 3, Figure 3), relugolix combination therapy produced rapid reductions in menstrual blood loss versus placebo, with gains in pain, anaemia, and uterine volume, and BMD preserved.[2] Efficacy was sustained through the open-label extension[3] and a withdrawal study to 104 weeks.[4] It is FDA-approved (2021) for this indication.

Table 3. Landmark trials of relugolix combination therapy in uterine fibroids
MBL, menstrual blood loss; PBAC, pictorial blood loss assessment chart; AE, adverse event.

Study	Design & N	Primary outcome	Key findings	Conclusion
LIBERTY 1 & 2 (2021)	Phase III RCT, double-blind, 24 wk (N=768)	71–73% achieved target MBL reduction vs 15–19% placebo (p<0.001)	Improved pain, anaemia, QoL; BMD preserved with add-back	Robust efficacy, favourable safety
LIBERTY Extension (2022)	Open-label, 52 wk (N=476)	87.7% sustained bleeding control	Stable bleeding patterns; BMD preserved	Durable efficacy, bone safety
Randomised Withdrawal (2023)	Up to 104 wk (N=229)	Sustained response 69.8–78.4%	Long-term control; mostly mild AEs; BMD preserved	Supports long-term, uterus-preserving therapy

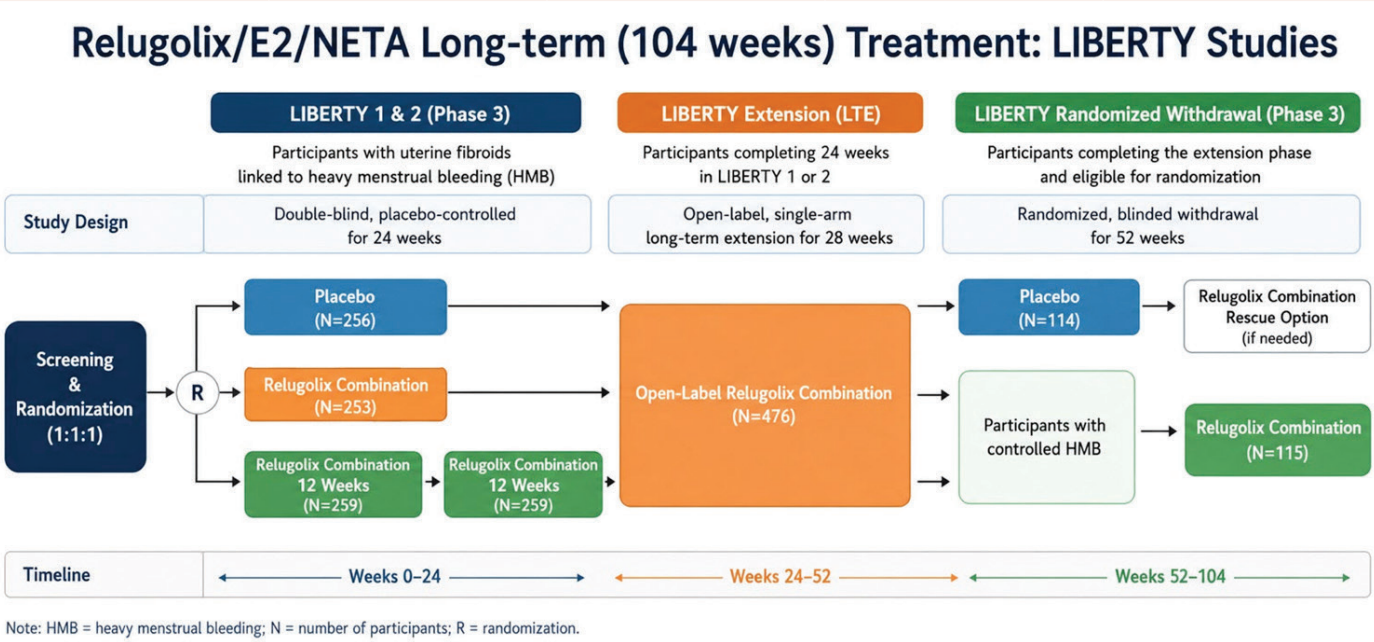


Figure 3. Design of the LIBERTY long-term (104-week) programme

CLINICAL EVIDENCE: ENDOMETRIOSIS

Endometriosis is a chronic, estrogen-dependent inflammatory condition causing dysmenorrhoea, pelvic pain, and infertility, often recurring after surgery. The replicate SPIRIT 1 and SPIRIT 2 trials (Table 4, Figure 4) showed significant improvement in dysmenorrhoea and non menstrual pelvic pain (NMPP) versus placebo, with better QoL and BMD loss under 1% at 6 months.[5] It is FDA-approved for moderate-to-severe pain.

Table 4. Trials of relugolix combination therapy in endometriosis-associated pain

Trial	Year	Design / population	Duration	Outcome
SPIRIT 1	2022	Phase III RCT; premenopausal women 18–50 yr with moderate/severe dysmenorrhoea and NMPP	24 wk	~75% dysmenorrhoea responders vs 27% placebo; 58% NMPP responders vs 40%
SPIRIT 2	2022	Phase III RCT (replicate)	24 wk	~75% dysmenorrhoea responders vs 30% placebo; 66% NMPP responders vs 43%
SPIRIT Extension	2024	Open-label continuation	Up to 104 wk	Sustained pain control with preserved bone safety

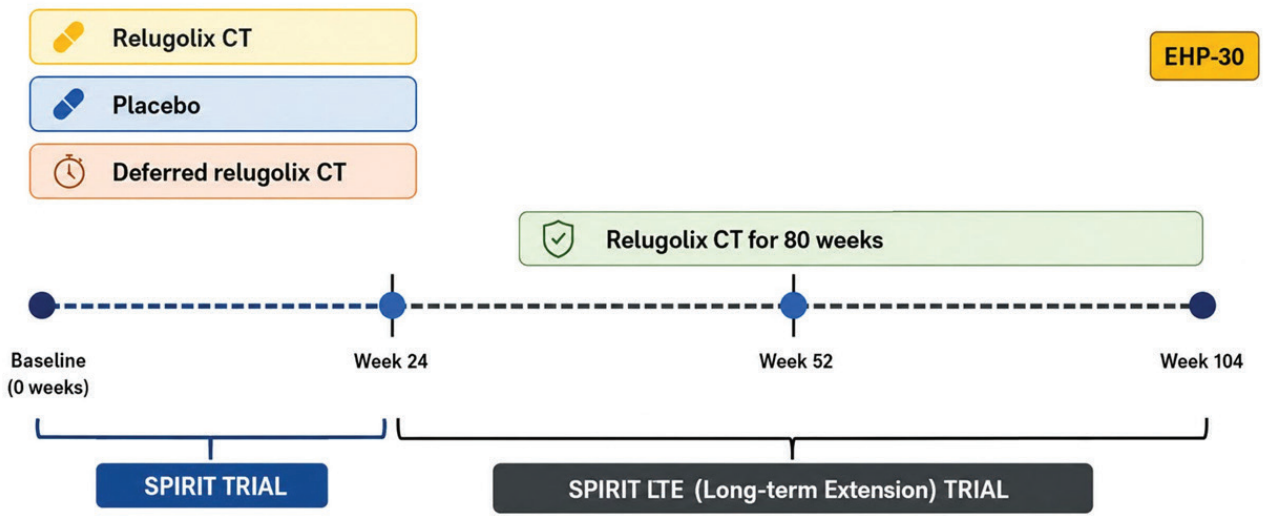


Figure 4. Design of the SPIRIT 1, SPIRIT 2 and SPIRIT extension trials

ADENOMYOSIS AND CONTRACEPTION

In the LIBERTY adenomyosis subgroup (n=111), relugolix combination therapy achieved an 83.8% responder rate and 22.2% reduction in uterine volume, supporting use in coexisting fibroids and adenomyosis.[6] The ongoing Phase 3 SERENE study is evaluating contraceptive efficacy in women aged 18–35 years.

COMPARISON: GNRH AGONISTS VERSUS ANTAGONISTS

Compared with GnRH agonists, antagonists such as relugolix provide direct receptor blockade, rapid suppression without a flare, oral administration and rapid reversibility (Table 5).

Table 5. GnRH agonists versus GnRH antagonists

Feature	GnRH agonists (leuprolide, goserelin)	GnRH antagonists (relugolix, elagolix)
Initial flare	Present	Absent
Onset of suppression	Delayed (2–4 weeks)	Rapid (within days)
Mechanism	Receptor stimulation then downregulation	Direct receptor blockade
Administration	Usually injectable	Oral
Reversibility	Slower	Rapid
Flare protection needed	Sometimes required	Not required
Patient convenience	Lower	Higher

PLACE IN PRACTICE AND INDIAN PERSPECTIVE

Relugolix combination therapy suits women wishing to avoid surgery, preserve fertility, or need long-term symptom control before assisted reproduction or after endometriosis surgery. DCGI approval (2024) and Indian data support its use as a practical, uterus-preserving option, though cost and adherence remain considerations.

CONCLUSION

Relugolix combination therapy offers effective, well-tolerated, once-daily management of fibroid-associated HMB and endometriosis-associated pain, combining rapid efficacy with bone- and fertility-conscious safety for up to two years. With robust global and Indian evidence, it is a meaningful advance in managing estrogen-dependent gynaecological disease.

KEY POINTS / TAKE-HOME MESSAGES

- Oral, once-daily GnRH antagonist; fixed-dose with estradiol 1 mg and norethindrone acetate 0.5 mg.
- Rapid pituitary suppression, no flare; promptly reversible on stopping.
- Add-back keeps estradiol level~20–50 pg/mL, preserving BMD and limiting VMS.
- Fibroid HMB: 71–73% response (LIBERTY), durable to 104 weeks.
- Endometriosis: ~75% reduction in dysmenorrhoea (SPIRIT); BMD loss <1% at six months.
- Treat for up to 24 months; exclude pregnancy before starting.
- Avoid in thromboembolism risk, hormone-dependent malignancy, osteoporosis, or significant hepatic impairment.

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MCQ

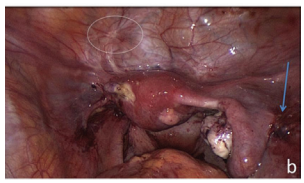
Bhanu Priya
Professor, Dept of obstetrics & Gynaecology, UCMS & Guru Teg Bahadur Hospital, Delhi

1. **A 32-year-old nulliparous woman presents with severe dysmenorrhea, deep dyspareunia, and dyschezia. Transvaginal ultrasound demonstrates a 2.8-cm deep infiltrating nodule involving the rectovaginal septum. No bladder or bowel muscularis involvement is noted. According to the #Enzian classification, this lesion is classified as:**



A. A1 B. B2 C. C2 D. A2

2. **Which statement regarding MRI evaluation of peritoneal endometriosis (P compartment) in the #Enzian classification is MOST accurate?**



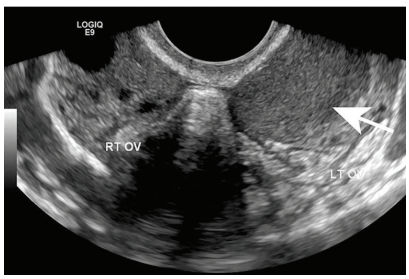
A. MRI demonstrates sensitivity exceeding 80% for peritoneal implants.

B. MRI has poor sensitivity but relatively high specificity for peritoneal lesions.

C. MRI assessment of peritoneal implants is superior to laparoscopy.

D. Identification of P lesions significantly alters surgical strategy in most cases.

3. **What is this sign known as and which IDEA protocol step is identified?**



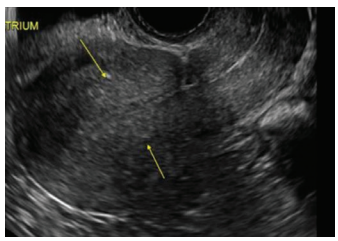
A. Sliding sign, Step 1 – Evaluation of uterus and adnexa

B. Kissing sign, Step 2 – Sonographic soft markers

C. Rain in forest sign, Step 3 – Sliding sign

D. Whirlpool sign sign, Step 4 – Evaluation of anterior/posterior compartments

4. **Which of the following is NOT a direct (major) sonographic feature of adenomyosis?**



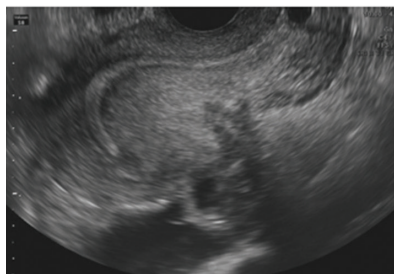
A. Myometrial cysts

B. Hyperechogenic islands

C. Sub endometrial lines

D. Globular enlargement of the uterus

5. **A 33-year-old nulliparous woman presents with severe dysmenorrhea and infertility for 3 years. 2-D transvaginal scan reveals the following picture. Identify the sign and pathology related to the same.**



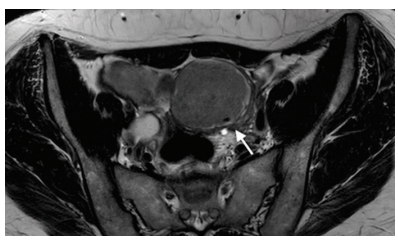
A. Sliding sign- Endometriosis

B. Question Mark sign-Adenomyosis

C. Whorled appearance- Fibroid uterus

D. Cog wheeled appearance- Pelvic inflammatory disease

6. **The hallmark MRI feature of an ovarian endometrioma is:**



A. T2 shine-through

B. T2 shading sign

C. Salt-and-pepper appearance

D. Target sign

7. A patient with refractory endometriosis-associated pain has failed medical management with oral contraceptives, progestogens, and GnRH agonists. Which of the following intervention can be used as second line therapy as per updated ESHRE 2022 guidelines:

A. Danazol

B. Aromatase inhibitors with concomitant hormonal suppression

C. LUNA procedure

D. Anti-progestogens alone

8. Which of the following scoring systems is most useful in predicting the probability of spontaneous conception after fertility enhancing surgery for endometriosis?

A. Revised American Society for Reproductive Medicine (rASRM) classification

B. Endometriosis Fertility Index (EFI)

C. Enzian classification

D. AAGL Endometriosis Classification

9. A 34-year-old woman with primary infertility for 5 years undergoes evaluation before IVF. Transvaginal ultrasound shows a globular enlarged uterus with heterogeneous myometrium (8 x 4 x 6cm) and multiple small myometrial cysts. MRI confirms diffuse adenomyosis. She undergoes controlled ovarian stimulation, and 6 good-quality blastocysts are available for cryopreservation. The couple asks about the optimal strategy before embryo transfer to improve implantation chances. Which of the following is the most appropriate management approach?

A. Immediate frozen embryo transfer without any pretreatment

B. Endometrial ablation before embryo transfer

C. Adenomyomectomy before embryo transfer

D. Administration of GnRH agonist for 3–4 months before embryo transfer

10. A 35-year-old woman with stage IV endometriosis presents with 5 years of infertility. She has bilateral ovarian endometriomas (5 cm on the right and 4 cm on the left). She undergoes IVF treatment after counselling regarding the potential impact of endometriosis and previous ovarian surgery on reproductive outcomes.

Which of the following statements regarding IVF outcomes in advanced endometriosis are TRUE, EXCEPT:

A. Endometriosis is associated with a lower cumulative pregnancy rate because fewer embryos are available for transfer.

B. Surgical excision of endometriomas before IVF significantly improves frozen embryo transfer outcomes.

C. The clinical pregnancy rate per frozen embryo transfer may be similar to that of women without endometriosis.

D. Endometrioma cystectomy may result in fewer oocytes and viable embryos being obtained.

Answer Key:

1-D, 2-B, 3-B, 4-D,5-B,6-B,7-B,8-B,9-D,10-B

Endometriosis and Mental Health: The Hidden Burden

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INTRODUCTION

Endometriosis is a condition affecting nearly 24.7 crore women globally and 4.2 crore women in India.[1] Apart from the physical symptoms, recent studies suggest a possible link between endometriosis and mental health leading to anxiety, depression and also sexual dysfunction.[2]

Endometriosis related pain and infertility are the leading factors linking endometriosis to mental health issues. The associated pain has a significant impact on the daily routine activities of the women hampering functional capacity which in turn interferes with academic achievements, career progress and social meetings which form a vicious circle resulting in chronic fatigue, and lag in the accomplishment of goals.[3]

Infertility can have profound psychological and social consequences for women, often leading to a perceived loss of control over reproductive decisions, along with feelings of guilt, sadness, shame, and social isolation. These experiences can substantially impair quality of life and have a detrimental impact on mental health.[4] Women with endometriosis-related infertility have been reported a higher prevalence of anxiety, depressive symptoms, and impaired quality of life compared with those without infertility.[5]

MENTAL HEALTH PROBLEMS

1. **Anxiety-** Women with endometriosis frequently report symptoms of anxiety, panic attacks, excessive health related concerns which arise due to uncertainty regarding disease progress, cure, relief from pain, infertility issues and concern for surgery.[2]
2. **Depression-** The combined burden of chronic pain and infertility in women with endometriosis can precipitate depression, resulting in significant adverse effects on their psychological well-being and overall quality of life. The systematic review and metaanalysis done by Wenwei Li in 2025 revealed a significant association between endometriosis and depression (RR = 2.93).[2]
3. **Sleep disturbances-** Chronic pain associated with endometriosis contributes significantly to sleep disturbances, which further exacerbate pain perception and psychological distress. The most frequently reported sleep disorders among affected women include insomnia, obstructive sleep apnea, restless legs syndrome, and circadian rhythm sleep–wake disorders.[3]
4. **Sexual dysfunction-** More than half of women with endometriosis experience dyspareunia during their reproductive years, with deep infiltrating lesions involving the uterosacral ligaments being particularly associated with painful intercourse. Endometriosis-related dyspareunia can adversely affect sexual functioning, diminish self-esteem, and negatively impact intimate relationships and overall relationship satisfaction with partners.
5. **Eating disorders-** Studies have demonstrated that pain associated with endometriosis is linked to impaired eating behaviors. Using validated questionnaires to evaluate eating patterns and related psychological factors, researchers observed significant differences between women with no or mild pain and those with moderate to severe pain. Women experiencing greater pain severity reported more negative beliefs, emotions, thoughts, and behaviors related to eating, suggesting that chronic pain associated with endometriosis may adversely influence eating habits and overall psychological well-being.[6]

GENETIC ASSOCIATION OF ENDOMETRIOSIS AND MENTAL HEALTH

Emerging evidence suggests that women with endometriosis have a shared genetic predisposition to mental health disorders, indicating a biological link between endometriosis and conditions such as depression and anxiety. Koller et al. showed a consistent genetic correlation with anxiety in linkage disequilibrium score regression analysis and significant associations for anxiety (odds ratio- 1.39) in Mendelian randomization analysis.[7]

Screening

Routine screening for mental health disorders should form an integral component of the comprehensive management of women with endometriosis. Due to high prevalence of anxiety, depression, chronic pain, sexual dysfunction, and impaired quality of life among affected women, regular assessment of mental health facilitates early identification of psychological disorders and enables timely intervention. Mental health evaluation should be performed at diagnosis, during follow-up visits, and whenever there is a significant change in symptoms or treatment course.

Validated assessment tools include:

- Patient Health Questionnaire-9 (PHQ-9)
- Generalized Anxiety Disorder-7 (GAD-7)
- Beck Depression Inventory (BDI)

- Endometriosis Health Profile (EHP-30)8
- Female Sexual Function Index (FSFI)

One of the widely used questionnaires is Endometriosis Health Profile (EHP-30) which is disease specific and reports quality of life of patients suffering from endometriosis which consists of 53 items including core questionnaire (30 items) and modular questionnaire (23 items). The core questionnaire consists of questions based on pain, emotional well being, social support, self image, control and powerlessness and modular questionnaire consists of specific questions on work, relationship with children, sexual intercourse, medical profession, treatment, infertility.

Management

Optimal management requires a multidisciplinary approach involving gynecologists, pain specialists, psychologists, psychiatrists, physiotherapists, fertility specialists, and sexual health counselors.

Treating endometriosis includes medical as well as surgical management that will eventually relieve the patient of the pain thus breaking the vicious cycle and improving the quality of life.

For mental health problems-

Psychological interventions

- Cognitive behavioral therapy
- Mindfulness-based stress reduction
- Acceptance and commitment therapy
- Supportive psychotherapy

Lifestyle modifications

- Regular physical activity
- Sleep hygiene
- Stress management
- Balanced nutrition
- Yoga and relaxation techniques

Social support

- Patient education
- Family counseling
- Support groups
- Fertility counseling

Medical support

- Anti depressant drugs
- Anti anxiety drugs

CONCLUSION

Endometriosis is not merely a gynecological disorder but a chronic condition with profound psychological and social consequences. Comprehensive management should therefore incorporate routine mental health assessment and evidence-based psychological support alongside medical and surgical treatment. Adopting a biopsychosocial approach can improve quality of life, treatment adherence, and long-term outcomes for women living with endometriosis.

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AOGD Clinical Meeting from Army Hospital- Research & Referral held on 31.07.2026

CASE 1: BEYOND THE EXPECTED: ATYPICAL PRESENTATION OF METHOTREXATE TOXICITY IN A CASE OF ECTOPIC PREGNANCY

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Introduction

1.5-2% of all pregnancies result in ectopic pregnancy and it causes pregnancy related mortality ratio (PRMR) of 0.45. Risk of ectopic pregnancy is 7 to 11-fold more among females with previous history of ectopic. Medical management with Methotrexate, a folic acid antagonist, is used in haemodynamically stable unruptured ectopic pregnancy patients. It has a good success rate for treating ectopic pregnancies and it offers the best chance of maintaining fertility after treatment. We report a case of atypical adverse event post methotrexate use in ectopic pregnancy.

Case Presentation

38-year-old G3P1L1A1, Post IVF conception at 5wk 6day with USG documented left unruptured tubal ectopic pregnancy with previous history of right rupture ectopic pregnancy. (underwent salpingectomy). She underwent multidose medical management with methotrexate 1mg/kg (55mg) (3 doses were given intramuscularly and 4th dose -intralesional) and folinic acid 0.1mg/kg (5.5mg) alternatively. Patient complained of mouth ulcer with nausea, vomiting and epigastric pain. Managed conservatively with PPI and antiemetics (relieved).

Patient remain asymptomatic till evening when she started having loose motions 7-8 episodes and managed with I/V fluids and prebiotics. Investigation were sent which showed pancytopenia (HB-7.6 , TLC- 170 Platelet-6000). Patient was reported to have MTX Toxicity and drug induced pancytopenia. She was started on I/V leucovorin and G-CSF and I/V antibiotics.

Discussion

MTX-induced intestinal mucositis affect entire gastrointestinal tract and is accompanied with nausea, bloating, abdominal pain and diarrhoea. The administration of MTX induces DNA strand breaks in rapidly proliferating intestinal epithelial cells and causes significant oxidative stress.

High-dose MTX can cause dose-limiting myelosuppression, but low-dose weekly therapy can cause hematologic toxicity in association with macrocytic red blood cells, but a more serious side effect is the development of pancytopenia.

Conclusion

MTX, a chemotherapeutic agent inhibits dihydrofolate reductase, carries significant toxicity risk as it blocks DNA synthesis. MTX toxicity often involves renal, hepatic, pulmonary, and hematologic complications. So strict monitoring is required.

CASE 2: ROLE OF ONCOFERTILITY IN GYNAECOLOGICAL CANCERS: PRESERVING HOPE BEYOND CURE

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Background

The incidence of cancer among adolescents and young adults (AYA) is increasing due to changing lifestyle patterns, obesity, environmental exposures, delayed childbearing, genetic predisposition, and improved diagnostic capabilities. As survival outcomes improve, preservation of fertility has emerged as a critical component of comprehensive cancer care. Oncofertility integrates oncology and reproductive medicine to safeguard reproductive potential without compromising oncological outcomes.

Methods

This presentation highlights three cases of young women with gynaecological malignancies managed using fertility-preservation strategies. The patients included a 32-year-old woman with a Sertoli–Leydig cell tumour, a 28-year-old woman with a serous borderline ovarian tumour, and a 31-year-old woman diagnosed with endometrioid endometrial carcinoma. All patients underwent multidisciplinary evaluation involving gynaecologic oncology and reproductive medicine teams. Fertility preservation methods included ovum pick-up, embryo cryopreservation, fertility-sparing surgery, and conservative hormonal treatment where appropriate.

Results: Successful fertility preservation was achieved in all three cases. Embryo cryopreservation was performed before definitive oncologic management. Following

treatment, all patients underwent frozen embryo transfer and subsequently conceived. One patient delivered healthy dichorionic diamniotic twins at 36 weeks, another achieved an ongoing pregnancy nearing term, and the third had an early viable pregnancy at the time of reporting. These outcomes demonstrate that carefully selected patients with early-stage gynaecological cancers can achieve favourable reproductive outcomes while maintaining oncological safety.

Conclusion: Oncofertility offers young women with gynaecological malignancies the opportunity to preserve fertility and achieve future parenthood. Early referral, appropriate patient selection, thorough counselling, and close collaboration between reproductive medicine specialists and gynaecologic oncologists are essential for optimal outcomes. Fertility preservation should be considered an integral component of cancer care in reproductive-aged women.

CASE 3: FRIEND TO FOE- A LIFE-THREATENING COMPLICATION POST-HYSTEROSALPINGOGRAPHY

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[1,2]Professor, Department of Obstetrics and Gynaecology and MIS, Army Hospital (Research & Referral), New Delhi

Background

Hysterosalpingography (HSG) is a simple, inexpensive, and widely used diagnostic procedure in infertility evaluation. Although generally considered safe, infectious complications can rarely occur and may result in significant morbidity and mortality. We present a rare case of severe post-HSG pelvic infection progressing to bilateral Tubo-ovarian abscess (TOA) and septic shock.

Case Presentation

A 36-year-old nulligravida undergoing infertility evaluation was found to have bilateral ovarian endometriomas. HSG performed for tubal assessment revealed bilateral hydrosalpinx. Within 24 hours of the procedure, she developed abdominal pain and vaginal bleeding, followed by high-grade fever and foul-smelling vaginal discharge. Despite initial antibiotic therapy, her condition deteriorated and she was referred to a tertiary care center.

On admission, she was hypotensive, febrile, and had signs of peritonitis. Laboratory investigations showed severe leucocytosis, elevated inflammatory markers, and sepsis. Broad-spectrum intravenous antibiotics and intensive care support were initiated. Imaging revealed large bilateral Tubo-ovarian abscesses with loculated pelvic fluid collections. Patient was in septic shock necessitated surgical intervention.

Diagnostic laparoscopy revealed a frozen pelvis with dense adhesions, bilateral tubo-ovarian abscesses, and approximately 300 mL of pus. Bilateral abscess drainage and salpingectomy were performed. Culture grew *Escherichia coli*. The patient showed gradual clinical improvement postoperatively and was discharged after 15 days.

Discussion

Post-HSG pelvic infection is uncommon, with an incidence of 0.3–1.3%. Risk factors include hydrosalpinx, endometriosis, endometrioma, prior pelvic inflammatory disease, and pelvic adhesions. Endometriomas may act as a favourable medium for bacterial growth, increasing the risk of severe infection and treatment failure. Early recognition, aggressive antimicrobial therapy, and timely surgical source control are essential for favourable outcomes.

Conclusion

Although HSG remains a valuable diagnostic tool in infertility workup, clinicians should be vigilant in patients with risk factors such as hydrosalpinx and endometriosis. Prompt diagnosis and multidisciplinary management of post-HSG infectious complications are crucial to prevent life-threatening outcomes.

AOGD 2026

48th Annual Conference of AOGD

Organized by:
Department of Obstetrics and Gynaecology , AIIMS, New Delhi

12th & 13th September 2026 | Venue: India Habitat Centre, New Delhi

With* HER (Heal, Empower, Respect) ..... *Every Step of the way!!!

REGISTRATION FORM

AOGD Member: Yes ☐ No ☐ **AOGD Membership No:** _____ **DMC No:** _____

Title: Prof. ☐ Dr. ☐ Mr. ☐ Ms. ☐ Mrs. ☐ **Gender :** Male ☐ Female ☐

First Name: _____ **Middle Name:** _____ **Last Name :** _____

Address: _____

Country: _____ **City:** _____ **State:** _____ **Pin:** _____

Telephone: _____ **Mobile No. With Country Code :** _____

Email: _____

(Please use block letter only) *(All the above fields are mandatory)*

CONFERENCE REGISTRATION FEES

CATEGORY	Early Bird (Till 31th July 2026)			Regular (1st Aug to 31st Aug 2026)			Onwards/On-spot		
	Amount	GST 18%	Total	Amount	GST 18%	Total	Amount	GST 18%	Total
☐ AOGD Member	6000	1080	7080	6500	1170	7670	7000	1260	8260
☐ Non-Member	7000	1260	8260	7500	1350	8850	8000	1440	9440
☐ PG Students	5000	900	5900	5500	990	6490	6000	1080	7080
☐ AOGD Member (above 70yrs)	Complimentary (Kindly email duly filled Registration Form along with age proof on our official email id mentioned below)								

Pre-Conference Workshop - 10th-11th September 2026

Early Bird (Till 31thst July 2026)			Regular (1st Aug to 31st Aug 2026)			Onwards / On spot		
Amount	GST 18%	Total	Amount	GST 18%	Total	Amount	GST 18%	Total
1500	270	1770	1800	324	2124	2000	360	2360

Opting For: 10th ☐ 11th ☐ Both Days ☐

Note: This registration form is intended exclusively for senior citizens who are not comfortable using computers or digital technology. All other delegates are kindly requested to register online through www.aogd2026.com.

Pre-Conference - 10th September 2026 (Tick your choice of workshop)

Sub-Committee	Session	Chairperson	Title	Venue
☐ Menopause & Geriatrics	Pre-lunch	Dr. Meenakshi Ahuja	Menopause and Ageing Skills Lab: Beyond the lecture	To be Updated
☐ Fetal Medicine and Genetics	Pre-lunch	Dr. Upma Saxena	Precision Prenatal Care in the Second Trimester: Early Risk Prediction Integrating Fetal Anatomy, Doppler and Genetics for Adverse Pregnancy Outcomes	VMMC old LT
☐ Safe Motherhood	Post-lunch	Dr Ratna Biswas	Safe Motherhood: Life-Saving Obstetric Interventions and Best Practices Across All Stages of Labour – A Video- Workshop	LHMC
☐ Infertility & Reproductive Endocrinology	Post-lunch	Dr Bindu Bajaj	IVF Decoded: From Basics to Breakthroughs	VMMC and Safdarjung Hospital
☐ QI Obst & Gynae Practice	Full Day	Dr Surveen Ghumman	Vision 2026: Building an ethos of Quality and Precision Care in OB/GYN	To be Updated

Pre-Conference - 11th September 2026 (Tick your choice of workshop)

Sub-Committee	Session	Chairperson	Title	Venue
☐ Urogynaecology	Pre-lunch	Dr Sonal Bhatla	Urogyn Video Surgical Workshop 2026 Real Cases, Real Challenges, Real Solutions	To be Updated
☐ Medico-legal	Pre-lunch	Dr Susheela Gupta	Bridging clinical excellence and legal safety: protecting patients, protecting practice Title for Medico-legal workshop	Fortis Hospital Shalimar Bagh Auditorium
☐ Adolescent Health / Community Health & Public Awareness	Pre-lunch	Dr Dipti Nabh Dr Divya Singhal	Adolescent gynaecology 360°: New Perspectives, New Paradigms	To be Updated
☐ Endoscopy / Endometriosis	Post-lunch	Dr Kanika Jain Dr Rita Bakshi	Surgical precision through camera vision: A hands-on video workshop	Sir Ganga Ram Hospital
☐ Oncology	Post-lunch	Dr Bindiya Gupta	INCISE Workshop: Shaping Skills in Gynae Oncology	UCMS and GTB hospital
☐ Research Methodology	Post-lunch	Dr. Neena Malhotra	Think, Design, Discover: A Hands-on Research Workshop	AIIMS

Note:

- Conference registration is mandatory for workshop registration.
- Delegates may select one workshop per session (Pre-lunch/Post-lunch) on each day of the two-day pre-conference workshop schedule.
- Workshop registration fees will be charged separately for each workshop selected.
- Post graduates to attach a certificate from HOD and also should be a member of the AOGD in order to attend and present a paper.
- Membership number is mandatory for registration in membership category. For any queries related to membership, you may contact **Ms. Sarita** (+91 92116 56757).
- For spot registrations, payment will be accepted via Cash, Card, or UPI only (cheques will not be accepted). Delegate kits will be provided subject to availability.
- Delegate kits will be handed over only to registered delegates.
- Registration is non transferable.
- No delegate kit, workshop material, or any other conference material will be distributed to Delegates, Associate Delegates, or PG Students after the conference.

Offline Payment Details

Account Name: AOGD 2026 **Account No:** 45142130513 **Bank Name:** State Bank of India

Branch: AIIMS, New Delhi **IFSC Code:** SBIN0001536 **MICR Code:** 110002005

Mode of Payment: NEFT/RTGS ☐

TR/Reference Number/Transaction Id : _____

For Cheque/DD Payments

For Cheque/DD Payment: Please issue the cheque in favor of **AOGD 2026**
Submit to: **Ms. Sarita** (+91 9211656757)
Name of account : AOGD 2026
Account number: 45142130513
IFSC code : SBIN0001536
Branch : AIIMS, New Delhi
New Delhi – 110001

Payment Details

DD/Cheque No: _____ **Dated:** _____

Drawn on (Name of the Bank): _____ **Branch:** _____ **Amount:** _____

Cancellation & Refund Policy

1. All cancellation requests must be submitted in writing to the AOGD Secretariat.
2. Cancellation requests received on or before 15th July 2026 will be eligible for a 75% refund of the registration fee paid.
3. Cancellation requests received between 16th July 2026 and 14th August 2026 will be eligible for a 25% refund of the registration fee paid.
4. No refund will be provided for cancellations received on or after 15th August 2026.
5. The refund process will commence 30 days after the conclusion of the conference.

NOTE: The Organizing Committee of AOGD 2026 shall not be liable for any delay, modification, postponement, or cancellation of the conference due to circumstances beyond its reasonable control, including but not limited to natural disasters, acts of God, terrorism, labor disputes, war, civil unrest, or government restrictions.

AOGD Office

Secretariat Address
AOGD, Department of Obstetric and Gynaecology, AIIMS, NEW DELHI
Email: aogdaiims2026@gmail.com
Mobile: +91 92116 56757

Conference Manager

Sem Events & Meetings Pvt. Ltd.
59-60, A2, Shiv Arcade, Acharya Niketan,
Mayur Vihar Phase 1 New Delhi, India
M: +91 81714 92255 | 84486 59213
Email: info@aogd2026.com

Previous Events, July, 2026

CME on "Ovarian Cancer – Precision Therapeutics and contemporary management" conducted by AOGD Oncology Committee and FOGSI on 5th July 2026 at The Suryaa Hotel





Webinar on pertinent issue in Adolescents Conducted by Adolescent health subcommittee, AOGD in association Delhi Gynae forum on 14th July 2026



MISSION ADOLESCENT HEALTH

Delhi Gynaecologist Forum in association with Adolescent Health Subcommittee AOGD

Tuesday, July 14th 2026, 4:00 - 5:00 pm

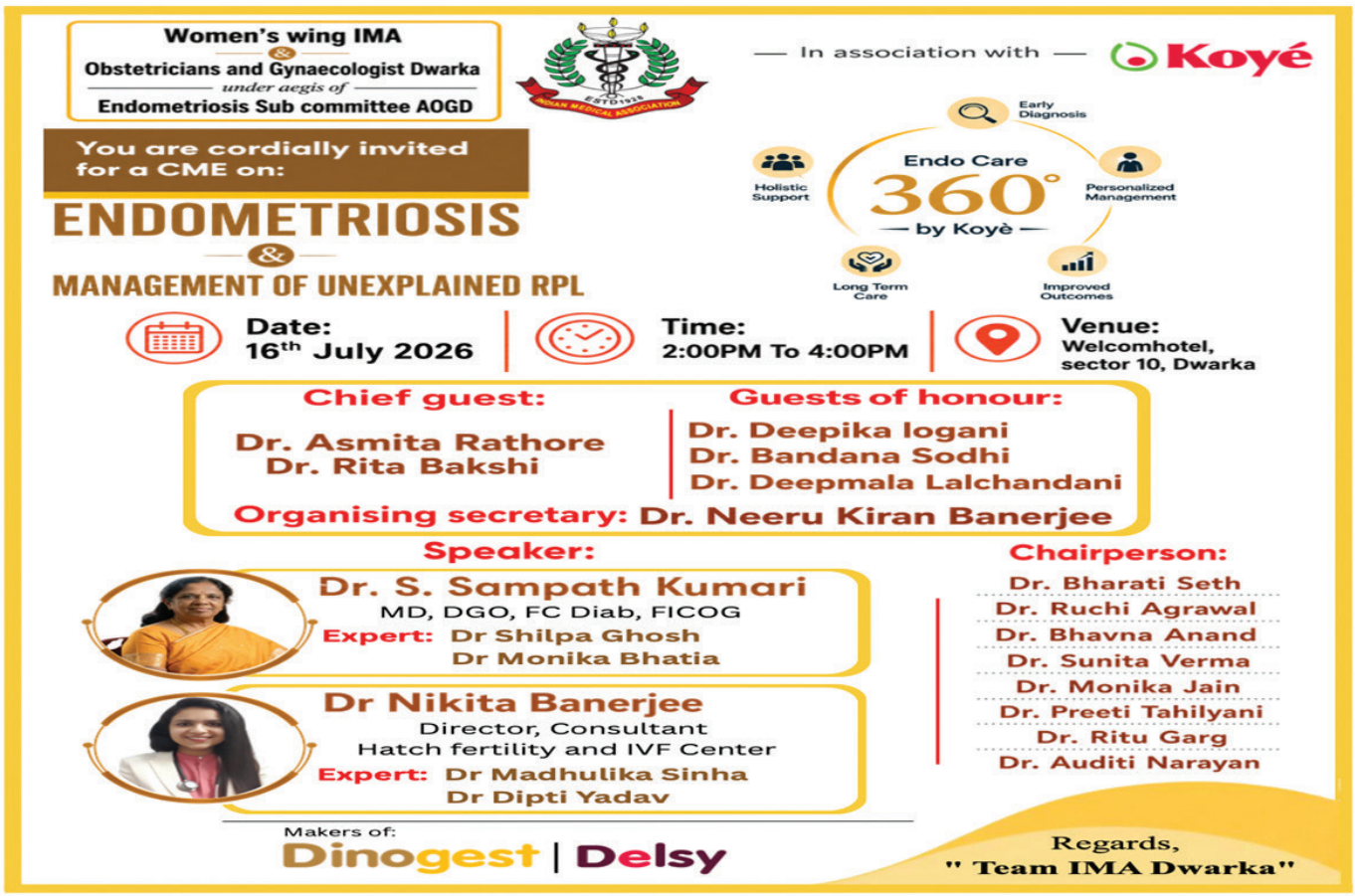
Patron: Dr Sharda Jain

Welcome Address: Dr Raka Guleria, Dr Dipti Nabh

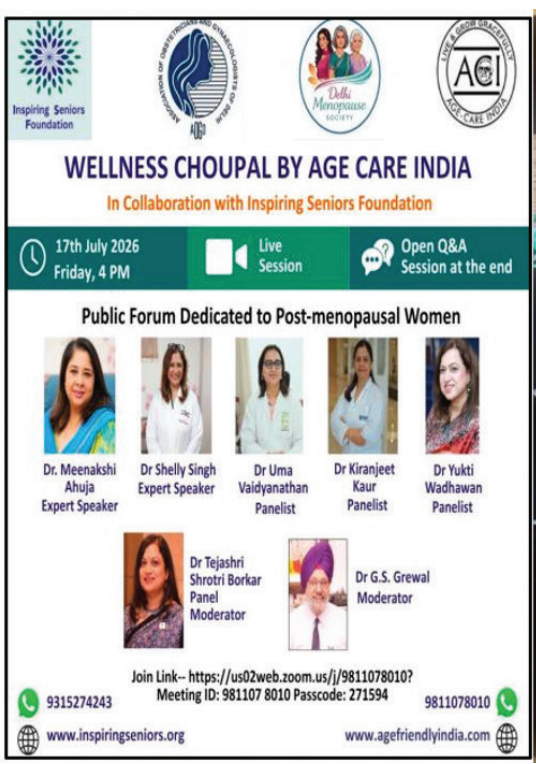
Time	Talk	Speaker	Experts
4:00- 4:15 pm	POCSO ACT simplified	Dr Panchampreet Kaur	Dr Chandra Mansukhani Dr Dipti Nabh Dr Meenakshi Sharma Dr Monika Gupta Dr Raka Guleria Dr Taru Gupta Dr Vandana Bagga Dr Yukti Wadhawan
4:15- 5:00 pm (Discussion:10 min)	POCSO Victims- Examination, Documentation and Real-world Challenges	Dr Richa Sharma	

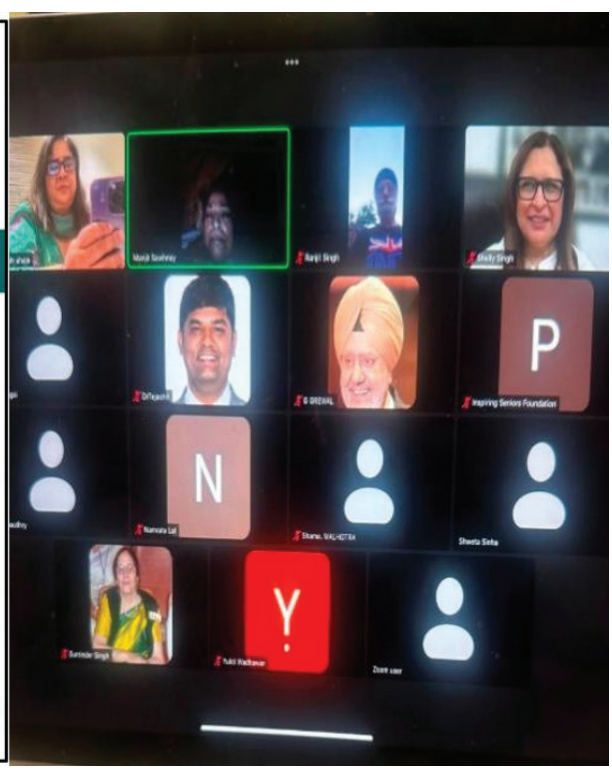
Vote of Thanks: Dr Panchampreet Kaur

Women's wing IMA and OBG Dwarka under aegis of Endometriosis Subcommittee, AOGD conducted a CME on Endometriosis and management of unexplained RPL on 16 July 2026 at Welcome hotel, Dwarka



Public awareness webinar on Menopause conducted by AOGD Menopause and Geriatric Subcommittee on 17th July 2026





Ek Guftagu, Public Awareness programme conducted by AOGD Menopause and Geriatric Subcommittee on 17th July at Devnagri designer store





A talk on Adolescent Menstrual Health and Anaemia for Students was conducted by Public Forum Committee on 17th July at N C Jindal Public School, Punjabi Bagh



A workshop on Optimal Birthing Positions conducted by the Dep. of Obst. & Gynae, AIIMS in collaboration with Astrika Foundation on 29.07.2026 at Mother and Child Block, AIIMS, Delhi.



A workshop on Respectful Maternity Care and Optimal Birthing conducted by the Dept. of Obst. & Gynae, AIIMS and MAMC & LNJP Hospital in collaboration with Astrika Foundation on 30th & 31st July at Maulana Azad Medical College



Public awareness CME on Endometriosis conducted by Endometriosis Committee AOGD & Clinical Research Committee FOGSI on 31.07.2026 at Sir Ganga Ram Hospital

SIR GANGA RAM HOSPITAL
Trust of Generations

Public Awareness CME on Endometriosis

Organized by
Institute of Obstetrics & Gynaecology, Sir Ganga Ram Hospital
under the aegis of
Clinical Research Committee of FOGSI
&
Endometriosis Committee of AOGD
Date : July, 31st 2026 - Friday,
Time : 9:00 am - 1:00 pm
Venue : Hall A, Auditorium, SGRH

TIME	TOPIC	SPEAKER	CHAIRPERSON
9:30 AM	INAUGURATION		
9:40 - 10:10 am	Medical Management of Endometriosis	Dr. Rita Bakshi	Dr. Geeta Mediratta Dr. Divya Singhal Dr. Preeti Gaur
10:10 - 10:40 am	Myriad Endometriosis Presentations & Laparoscopic Surgical Management	Dr. Punita Bhardwaj	Dr. Dipika Loganey Dr. Vandana Gupta Dr. Neeti Tiwari
10:40 - 11:00 am	Tea Break		
11:00 - 11:30 am	Endometriosis Associated Ovarian Cancer	Dr. Mala Srivastava	Dr. Harsha Khullar Dr. Shweta Mittal Dr. Ruma Satwik
11:30 - 12:20 pm	Panel Discussion Learning Through Cases : Challenges in Endometriosis	Moderator : Dr. Kanika Jain & Dr. Indu Chugh Experts : Dr. Chandra Mansukhani & Dr. Neema Sharma Panelists :- Dr. Reena Yadav, Dr. Ila Sharma, Dr. Neha Varun, Dr. Sakshi Nayar, Dr. Shivani Sabharwal, Dr. Kanika Kumari& Dr. Sharmistha Garg	
12:30 pm onwards	LUNCH Break		





FOGSI Reach CME on AUB conducted by Dept. of Obst & Gynae, AIIMS on 31.7.2026 at Hotel Eros







CME on 31 July 26 on CHANGING FACE OF MENOPAUSE in Dwarka under Aegis of AOGD Menopause and Geriatric Health with Delhi Menopause Society and DGF SW on 31.07.26 at Jaminis Landmark, Dwarka

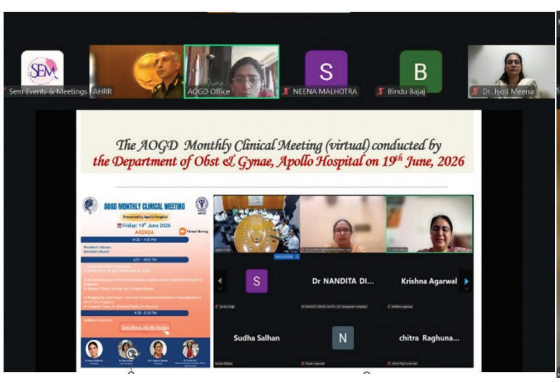


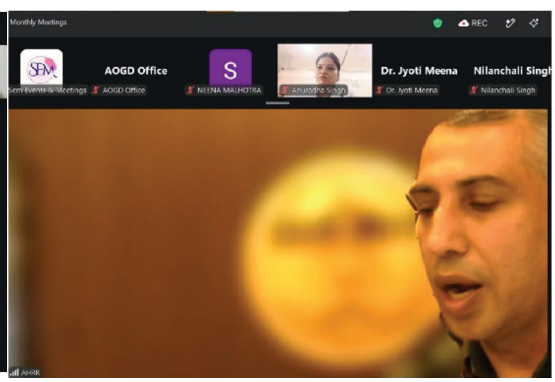




The AOGD Monthly Clinical Meeting (virtual) conducted by the Department of Obst & Gynae, Army Hospital – Research & Referral on 31st July, 2026







Association of Obstetricians & Gynaecologists of Delhi

MEMBERSHIP FORM

Name:.....

Surname: .....

Qualification (with year): .....

Postal Address: .....

City:..... **State:** ..... **Pin code:** .....

Place of Working: .....

Residence Ph. No. ..... **Clinical / Hospital Ph. No.** .....

Mobile No:..... **Email:** .....

Gender: Male:..... **Female:**.....

Date of Birth: Date.....**Month** ..... **Year**.....

Member of Any Society:.....

Cheque/DD / No: .....

PHOTO

Cheque/Demand Draft should be drawn in favour of: AOGD 2026

FOR ONLINE TRANSFER THROUGH NEFT/RTGS

Name of Account: AOGD 2026

Account no: 45142130513

Name of Bank: State Bank of India

Branch: AIIMS, New Delhi

IFSC code: SBIN0001536

MICR code: 110002005



For Life Membership	: Rs. 11,000 + Rs. 1,980 (18% GST applicable) = Rs. 12,980/-
For New Annual Membership*	: Rs. 2,000 + Rs. 360 (18% GST applicable) = Rs. 2,360/-
For Old Renewal Membership+	: Rs. 1,200 + Rs. 216 (18% GST applicable) = Rs. 1,416
Entrance Fees (Payable once)	**: Rs. 400/-**

Encl.: Attach Two Photocopies of All Degrees, DMC Certificate and Two Photographs (Self attested)

*** Annual Membership is for the calendar year January to December.**

*** In case of renewal, mention old membership number.**

*** Life membership on or after 1st January, 2022 shall have to renew the life membership after 20 years. The minimum renewal amount will be 25% of the prevailing subscription fee at time of renewal.**

Note: 18% GST will be applicable as FOGSI requires it.

Send Complete Membership Form Along with Cheque / DD and Photocopy of required documents to the secretariat.
For online transaction send scan copy of all documents with payment slip on given mail id

Secretariat

AOGD Office, Room No. 714, 7th Floor, Mother & Child Block, Department of Obstetric and Gynaecology, All India Institute of Medical Science (AIIMS), New Delhi- 110029

Tel.: 011-29576771, (M): 9717392924 | Email Id: aogdaiims2026@gmail.com

AOGD SECRETARIAT

AOGD Office, Room No. 714, 7th Floor, Mother & Child Block, Department of Obstetric and Gynaecology,
All India Institute of Medical Science (AIIMS), New Delhi- 110029
Tel.: 011-29576771, (M): 9717392924 | Email Id: aogdaiims2026@gmail.com