AOGD BULLETIN

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Safeguarding women and their Doctors

Issue Theme:
Uterine Fibroid: Here, there, everywhere; anytime, everytime

AOGD SECRETARIAT

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Foreword

It gives me immense pleasure to write the foreword to the first issue of the AOGD Bulletin from team MAMC. The issue is focussed on uterine fibroids, a common condition in women. Though only a quarter of these are clinically significant to require any intervention, they form a significant proportion of Gynaecology OPD attendance. After detecting fibroids it is extremely important to decide whether any treatment is required and if needed which is the best option. Evidence based knowledge and guidelines do help you, however, the management needs to be individualized and tailored for each woman. The knowledge of newest and pre-existing treatment modalities is the need of the time. Non-surgical management options are available in different forms with variable success rates and effect on future fertility. Various surgical options, the controversy surrounding power morcellator, the background and the current guidelines are a must know. Fibroids in pregnancy is a unique situation requiring specialized antenatal care and the role of caesarean myomectomy is on the cusp.

This issue covers all this very well and the authors have done justice to the topic.

The theme of AOGD this year is "Safeguarding women and their Doctors" is relevant to what we see all around us. The doctors bear the brunt of ALL when there is an adverse outcome. The decision of AOGD to constitute a support group is like a breath of fresh air we all need. My Best wishes to the AOGD team at Maulana Azad Medical College for a fruitful year ahead.

Professor Suneeta Mittal
MD, FRCOG(ae), FICOG, FAMS, FICMCH, FIMSA,FICLS
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From the AOGD Office


Dr. Asmita M. Rathore


Dr. Y. M. Mala


Dr. Deepti Goswami

Greetings to all!
Dear Friends,
It is a great honour and privilege to be able to reach out to you all via this first message from the AOGD office. On behalf of Team MAMC, we thank all AOGD members for entrusting us with the AOGD secretariat for tenure 2022-2023, and we pledge to put forth our best efforts to ensure that the Association achieves new heights during our term.
Women's health in all of its aspects - maternal - fetal & neonatal health, oncology, infertility, psychosocial issues, etc., needs enhanced attention in post COVID phase. The rising tide of violence against health-care workers, as evidenced by Dr. Archana Sharma's suicide, has left us all shaken. The growing mistrust between patients and doctors is instilling perceptible fear in doctors, particularly Obstetricians who work with young, healthy women. This requires immediate, multipronged addressal on an urgent basis so as to permit us to deliver our professional duties to the best of our abilities.
The theme of AOGD chosen for this year is '**Safeguarding Women and their Doctors**' and our team is fully geared up to achieve this. We are looking forward to all members of the AOGD family participating fully and actively in this journey over the coming year. Your suggestions are important to achieve our goals.
With relentless efforts and selfless sacrifices, we have collectively fought and won a lengthy struggle against COVID 19, and the light at the end of the tunnel is apparent. Life is returning to normal, and we hope to see you at our Annual Conference on November 12-13, 2022.
With immense pleasure we present to you our inaugural bulletin that is the result of our Editorial team's hard work, led by Dr. Madhavi Mathur Gupta. We are sure all of you will enjoy reading it.
Long Live AOGD

Dr. Asmita M Rathore, President
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From the Editor's Desk

Dr. Madhavi M. Gupta
Editor

Dr. Nalini Bala Pandey

Dr. Chetna A. Sethi

Dr. Reena Rani

Co-Editors

Greetings to all!

Dear friends

It is an honour to be speaking to all of you through this bulletin. Dr. Asmita M Rathore, President AOGD has put her faith in us and given us this wonderful opportunity.

My creative and dynamic team include Dr. Nalini B Pandey, Dr. Chetna A Sethi and Dr. Reena Rani. Dr. Devender Kumar was also a part of this journey but due to his untimely demise it ended before it began. We deeply miss him.

The Safdarjung team has set high benchmark for us. We will strive our best to bring forth research topics relevant to our readers.

The theme for AOGD 2022-23 is **'Safeguarding Women and their Doctors'**

Our issue would be focused on research which has been instrumental in the evolution of evidence in the last few years. In the first issue, the focus will be on **PEARL study**, which deals with the use of ulipristal acetate in uterine fibroids, the most common gynaecological condition encountered in approximately 70% women by menopause. Even during pregnancy, it is the most common pelvic tumour in first trimester. We have discussed both non-surgical and surgical management and also covered fibroid in pregnancy. The controversy surrounding power morcellation resulted in caution and advisory when using. The indications for the use of ulipristal acetate have changed. Fibroid during pregnancy poses a challenge & caesarean myomectomy can be done in some situations.

I sincerely thank all the authors for their contribution in putting together an article which will make an interesting read.

Last but not the least, rising incidents of violence against doctors are a matter of concern. We will devote a small section on how to handle & what awareness we as doctors should have; also, discuss the support system available.

With you in health,

Dr. Madhavi M Gupta
Editor

Obituary

Writing this obituary for our dearest Dr. Devender was the most painful thing. It's not possible to sum up his accomplishments, and our fond memories of him in a few short paragraphs.

Dr. Devender Kumar, Professor, Department of Obstetrics & Gynecology & Head, Department of Medical Education, Maulana Azad Medical College, New Delhi passed away due to sudden MI on 17th April 2022 at the age of 55.

Dr. Devender is survived by his parents; his wife, Dr. Asmita Patil; his children; Manasi and Ayush, and his two siblings.

Dr. Devender graduated from JIPMER, Puducherry with a degree in medicine and went on to do his postgraduation and senior-residency. He worked as a faculty member at JIPMER, Puducherry. He married Dr. Asmita, a fellow doctor.

Dr. Devender was a devoted husband and father. He was an avid cyclist, ran marathons, and loved nature. He enjoyed taking pictures and saving every occasion for posterity. He would share those pictures with all of us. Fondness for urdu poetry was another aspect of his multi-faceted personality.

Dr. Devender was an empathetic doctor, an excellent teacher and a brilliant surgeon. Though he was with us for only a span of 13 years but it seemed that we had known him forever. That was Dr. Devender to his colleagues and friends and Devender sir to all his students.

Life will continue, but it will never be the same without him. We, as a department are committed to carrying forward his vision and will work whole heartedly to make our department the best learning experience for our undergraduates and this will be our tribute to him.

He will be fondly remembered and dearly missed by all.

The Game changer: The PEARL studies-I, II, III, IV

Madhavi M Gupta
Director Professor, Department of Obstetrics & Gynaecology, MAMC & Lok Nayak Hospital

Abstract of the research articles are available free at the journal websites and on PubMed (http://www.ncbi. nlm.nih.gov/pubmed)

The findings and conclusion of the PEARL studies I, II, III and IV have been briefly provided and though found useful here. It's use has been significantly limited on account of post marketing reports of rare but serious liver injury, including need for liver transplantation.[1]

Ulipristal acetate (UPA), a selective progesterone receptor modulator has a predominant inhibitory effect on the progesterone receptor. Ulipristal acetate inhibits progesterone receptors and causes cell apoptosis and restricts the fibroid growth by inhibiting cell proliferation. It was being prescribed in uterine fibroids for bleeding symptoms and uterine enlargement. Ulipristal acetate is approved outside the United States.

In 2021, the European Medicines Agency and other regulatory agencies like MHRA (Medicines and Healthcare products Regulatory Agency) have recommended to significantly limit the use of daily ulipristal acetate for leiomyoma treatment due to the risk of serious liver injury and liver failure, with some cases requiring liver transplantation[1,2]. The use has been restricted only for intermittent treatment of moderate to severe symptoms of uterine fibroids before menopause and when surgical procedures (including uterine fibroid embolization) are not suitable or have failed.

The PEARL studies have investigated ulipristal acetate in four phase 3 trials.

Pearl I

Donnez J, Tatarchuk TF, Bouchard P, Puscasiu L, Zakharenko NF, Ivanova T, Ugocsai G, Mara M, Jilla MP, Bestel E, Terrill P, Osterloh I, Loumaye E; PEARL I Study Group. Ulipristal acetate versus placebo for fibroid treatment before surgery. N Engl J Med. 2012 Feb 2;366(5):409-20. doi: 10.1056/NEJMoa1103182. PMID: 22296075.

It was a double-blind, placebo-controlled study, having two arms of UPA of 5mg and 10 mg and a third arm of placebo for a duration of 12-13 weeks.

At 13 weeks, uterine bleeding was controlled in 91% of the women receiving 5 mg of ulipristal acetate, 92% of those receiving 10 mg of ulipristal acetate, and 19% of those receiving placebo ($P<0.001$ for the comparison of each dose of ulipristal acetate with placebo). The median changes in total fibroid volume were -21%, -12%, and +3% ($P=0.002$ for the comparison of 5 mg of ulipristal acetate with placebo, and $P=0.006$ for the comparison of 10 mg of ulipristal acetate with placebo).

In summary, PEARL I showed that ulipristal acetate effectively controls excessive bleeding and pain due to fibroids and reduces fibroid size, with a frequency of side effects similar to that with placebo.

Pearl II

Donnez J, Tomaszewski J, Vázquez F, Bouchard P, Lemieszczuk B, Baró F, Nouri K, Selvaggi L, Sodowski K, Bestel E, Terrill P, Osterloh I, Loumaye E; PEARL II Study Group. Ulipristal acetate versus leuprolide acetate for uterine fibroids. N Engl J Med. 2012 Feb 2;366(5):421-32. doi: 10.1056/NEJMoa1103180. PMID: 22296076.

This was a randomised double - blind trial. It studied the efficacy and side-effect profile of ulipristal acetate as compared with those of leuprolide acetate for 12-13 weeks. Uterine bleeding was controlled in 90% of patients receiving 5 mg of ulipristal acetate, in 98% of those receiving 10 mg of ulipristal acetate, and in 89% of those receiving leuprolide acetate.

In summary, PEARL II showed that ulipristal is not inferior to leuprorelin in reducing uterine bleeding and fibroid size prior to surgery but has superior tolerability, with a lower incidence of adverse side effects such as hot flushes and low levels of oestradiol.

Pearl III and Pearl III extension

Donnez J, Vázquez F, Tomaszewski J, Nouri K, Bouchard P, Fauser BC, Barlow DH, Palacios S, Donnez O, Bestel E, Osterloh I, Loumaye E; PEARL III and PEARL III Extension Study Group. Long-term treatment of uterine fibroids with ulipristal acetate ☆. Fertil Steril. 2014 Jun;101(6):1565-73.e1-18. doi: 10.1016/j.fertnstert.2014.02.008. Epub 2014 Mar 12. PMID: 24630081.

It was a long-term multi-centre trial with the aim to investigate the efficacy and safety of ulipristal acetate (UPA) for long-term treatment of symptomatic uterine fibroids. The study evaluated the continuous efficacy and safety of sustained intermittent treatment with up to four repeated 3-month courses of 10 mg/day ulipristal immediately followed by 10-day double-blind treatment with nor ethisterone acetate (NETA) (10 mg daily) or placebo for the long-term treatment of moderate to severe symptoms of uterine fibroids.

In summary, the authors concluded that repeated 3-month UPA courses effectively control bleeding and shrink fibroids in patients with symptomatic fibroids, with no increase in side-effects over time.

Pearl IV

Donnez J, Hudecek R, Donnez O, Matule D, Arhendt HJ, Zatik J, Kasilovskiene Z, Dumitrascu MC, Fernandez H, Barlow DH, Bouchard P, Fauser BC, Bestel E, Terrill P, Osterloh I, Loumaye E. Efficacy and safety of repeated use of ulipristal acetate in uterine fibroids. Fertil Steril. 2015 Feb;103(2):519-27.e3. doi: 10.1016/j.fertnstert.2014.10.038. Epub 2014 Dec 24. PMID: 25542821.

Donnez J, Donnez O, Matule D, Ahrendt HJ, Hudecek R, Zatik J, Kasilovskiene Z, Dumitrascu MC, Fernandez H, Barlow DH, Bouchard P, Fauser BC, Bestel E, Loumaye E. Long-term medical management of uterine fibroids with ulipristal acetate. Fertil Steril. 2016 Jan;105(1):165-173.e4. doi: 10.1016/j.fertnstert.2015.09.032. Epub 2015 Oct 23. PMID: 26477496.

PEARL IV also investigated long-term intermittent use of ulipristal. It was a double-blind multi-centre trial to investigate the efficacy and safety of repeated 12-week courses of 5 or 10 mg daily of ulipristal acetate for intermittent treatment of symptomatic uterine fibroids

The authors concluded that repeated 12-week courses of daily oral ulipristal acetate (5 and 10 mg) effectively control bleeding and pain, reduce fibroid volume, and restore quality of life (QoL) in patients with symptomatic fibroids. The results of this study demonstrate the efficacy and further support the safety profile of repeated intermittent treatment of symptomatic fibroids with ulipristal acetate.

Though the PEARL studies have shown that ulipristal acetate offers an efficient alternative treatment option for long-term management of uterine fibroids and the associated management of heavy uterine bleeding, the risk of serious liver injury has many regulatory agencies issuing guidance to further restrict its use and dose to 5mg.

In November 2020, the Drugs Controller General of India (DCGI) suspended the manufacturing, sale or distribution of ulipristal acetate tablets 5 mg.

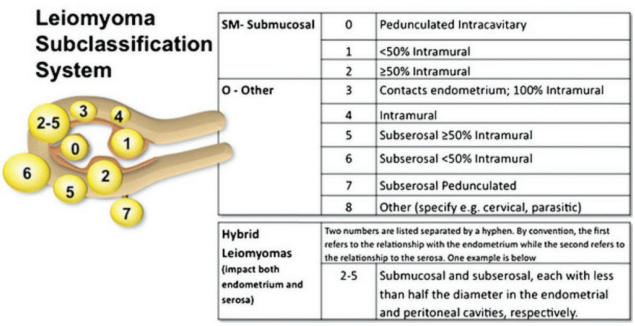
Reference

1. European Medicines Agency. Ulipristal acetate 5mgmedicinal products. Available at: https://www.ema.europa.eu/en/medicines/human/referrals/ulipristal-acetate- 5mg-medicinal-products. Accessed May 8, 2022. (Level III)
2. MHRA drug safety update on ulipristal acetate.https://www.gov.uk/drug-safety-update/ulipristal-acetate-5mg-esmya-further-restrictions-due-to-risk-of-serious-liver-injury [2021] Accessed May 8, 2022.

Non-Surgical Management of Fibroids

Kamna Datta*, Aparajita**
*Professor, **Postgraduate Resident, ABVIMS and Dr. RML Hospital, New Delhi

Uterine leiomyomas are the most common pelvic tumours in women. They are benign tumors arising from the myometrium usually in reproductive age women. The International Federation of Gynecology and Obstetrics (FIGO) has classified fibroids depending on their location[1] (Fig 1).



SM- Submucosal	0	Pedunculated Intracavitary
	1	<50% Intramural
	2	≥50% Intramural
O - Other	3	Contacts endometrium; 100% Intramural
	4	Intramural
	5	Subserosal ≥50% Intramural
	6	Subserosal <50% Intramural
	7	Subserosal Pedunculated
	8	Other (specify e.g. cervical, parasitic)
Hybrid Leiomyomas (impact both endometrium and serosa)	Two numbers are listed separated by a hyphen. By convention, the first refers to the relationship with the endometrium while the second refers to the relationship to the serosa. One example is below	
	2-5	Submucosal and subserosal, each with less than half the diameter in the endometrial and peritoneal cavities, respectively.

Fig 1: The FIGO myoma subclassification system

Source: Munro MG, Critchley HO, Broder MS, Fraser IS. The FIGO Classification System ("PALM-COEIN") for causes of abnormal uterine bleeding in non-gravid women in the reproductive years, including guidelines for clinical investigation. Int J Gynaecol Obstet 2011; 113:3–13.

The majority of fibroids are asymptomatic but many patients have symptoms which warrant treatment. These symptoms vary in intensity according to the number, size, and location of the fibroids. Symptoms can be classified into-

- Abnormal bleeding - Heavy and/or prolonged menstruation. The cause of heavy menses in patients with fibroids includes both microscopic and macroscopic abnormalities of the uterine vessels, dysfunctional endometrial hemostasis, or molecular dysregulation of angiogenic factors. Intramural and submucosal fibroids are also associated with varying degrees of spasmodic dysmennorhea.
- Pressure symptoms – Large fibroids may cause dragging sensation or dull aching pain. Other symptoms may include urinary complaints like increased frequency or difficulty emptying the bladder. Bladder symptoms usually result from an anterior fibroid pressing directly on the bladder or a posterior fibroid pushing the entire uterus anteriorly. Larger fibroids may also be associated with hydronephrosis. Fibroids arising posteriorly may compress the rectum and result in constipation. Rarely fibroids can compress the vena cava and lead to an increased risk of thromboembolic phenomena.
- Reproductive dysfunction and obstetric complications.

Management Options for Uterine Fibroids

The decision for expectant, medical, surgical or minimally invasive methods should be made taking into consideration the patients' age, need to preserve fertility or the uterus, availability of treatment options, follow-up facility and surgeon expertise along with patient specific symotoms and severity.

Expectant Management

In women with asymptomatic fibroids, the decision to undertake expectant management is made with the woman, after a discussion regarding periodic evaluation.

Medical Therapy for Bleeding Symptoms

NON-HORMONAL

Non-Steroidal Anti-Inflammatory drugs and Mefenamic Acid

NSAIDS like Mefenamic acid in patients with uterine fibroids act solely by controlling pain and bleeding by inhibiting cyclo-oxygenase enzyme and by reducing prostaglandin production. They may also be used in adjunct with other therapies.

Tranexamic acid

Tranexamic acid is a nonhormonal drug that can be taken during menses to decrease blood flow. It is preferred by patients who cannot or do not

wish to use hormonal medications. Tranexamic acid is a systemic anti-fibrinolytic and acts by inhibiting conversion of plasminogen to plasmin, hence preventing fibrinolysis. It causes significant decrease in blood loss during menstruation. Route of administration is both oral and parenteral. Dosage is 1- 1.3g thrice a day orally for 3-5 days and 10-15mg/kg by slow intravenous injection every 6 to 8 hours. Since it is mainly excreted by the kidneys, dose adjustment is required in renal disorder patients.[2]

HORMONAL

ORAL

Contraceptive steroid hormones are reasonable option for treatment of heavy menstrual bleeding though there is limited evidence in cases of bleeding associated with leiomyomas. There is no evidence to support their use to manage pressure symptoms due to fibroids.[3]

- **Estrogen-progestin contraceptives–** Combined estrogen- progestin contraceptives are commonly used for patients with heavy menstrual bleeding (HMB) and fibroids, especially those who additionally desire contraception[4]. They also reportedly reduce iron deficiency anemia, incidence of uterine and ovarian cancer. They come in varied forms of oral pills, vaginal rings, or transdermal patches and choice of form is driven by patient preferences, dosing and frequency of use. Mechanism of action is by suppressing ovulation and by thinning of the endometrium.
- **Progestin-only contraceptives–**Oral progestin -only contraceptives, progestin implants, and progestin injections have been used in women with fibroids to control HMB though they are more effective in abnormal uterine bleeding caused by factors other than fibroids. They are seen to be less efficacious than combined pills and progesterone releasing intrauterine device. Mechanism of action is by inducing endometrial atrophy.[5] Commonly used progesterones include Medroxyprogesterone acetate tablets (20-30mg/day) or norethisterone acetate tablets (5-15mg/day) in divided doses.

Levonorgestrol Intrauterine System :

- **Progestin-releasing intrauterine devices–** It is one of the most effective medical method to reduce menstrual blood loss and increase haemoglobin levels and relieve symptoms in women with leiomyomas. For patients in whom estrogen-containing contraceptives are contraindicated, the levonorgestrel -releasing intrauterine devices are the main stay treatment. Various trials have shown its efficacy over oral contraceptives with no conclusive effect on uterine volume reduction. LNG-IUS contains 52mg of levonorgestrel and releases approximately 20mcg/day. It also provides long-acting effective contraception. Many guidelines support the use of LNG IUS as a first-line agent for fibroid-related HMB. However, women with intracavitary lesions like submucosal fibroids should not be suggested IUDs as it poses risk of expulsion of the IUD due to the distorted endometrial cavity.[6]

Gonadotropin Releasing Hormone Antagonists with Hormonal Add Back Therapy

Oral GnRH antagonist with hormonal add-back have be used for the treatment of AUB-L for up to 2 years. **Elagolix** is one of the commonest gonadotropin releasing hormone antagonists that results in suppression of gonadotropins and ovarian hormones. Suppression has been found to be reversible and dose dependent. As per U.S. Food and Drug Administration (FDA), combination of elagolix (300 mg upto twice a day) with additional therapy (1 mg estradiol ,0.5 mg norethindrone acetate once daily) is -approved for up to 24 months of use to treat heavy menstrual bleeding associated with uterine leiomyomas (ie, AUB-L). **Relugolix** is a new well tolerated drug (40mg along with add back therapy) with promising results in decrease in excessive blood loss during menstruation and also claimed decrease in uterine volume.[7,8]

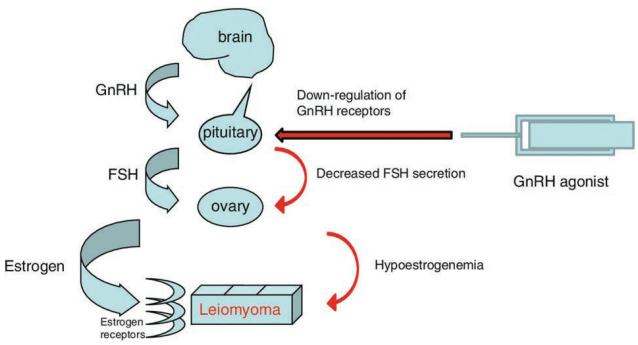
The hormonal therapy is indicated to decrease the hypoestrogenic effects of elagolix, including hot flushes, increased lipid levels, and bone mineral density loss. Flare phenomenon is lesser with antagonists thereby making it more convenient for use as compared to agonists. Elagolix is not available in India and use of cetrorelix has limited studies to support its usage for uterine leiomyomas.

Medications for Bleeding and Uterine Enlargement

Gonadotropin releasing hormone agonists

GnRH agonists with or without add back therapy are recommended for control of bleeding and uterine enlargement associated with leiomyoma. They act by desensitizing and downregulating GnRH receptors thereby preventing cell proliferation. Treatment duration usually lasts 3-6 months resulting in significant reduction of fibroid size but fibroids return to their original size within 6 months of cessation of treatment.

GnRH therapy before surgical intervention has shown to reduce uterine volume. Compared with no bulk reducing treatment before surgery, GnRH agonists are beneficial in rectifying anemia, reducing blood loss and operative time, decreased postoperative problems and duration of hospital stay and also showed increase in the proportion of vaginal surgeries compared to abdominal ones.[9]



- Commonly used agonist molecules include goserelin and leuprolide as depot injections. Inj Leuprolide is given as 3.75-7.5 mg/month and goserelin (Zoladex subcutaneous implant) given as 3.6 mg/month. Buserelin and naparelin are available as nasal sprays but their efficacy is not yet established.
- The hypoestrogenic effects such as hot flashes, atrophic vaginitis and loss in bone mineral density limit their use to shorter durations of a maximum of 6-months. With add back therapy the treatment may be extended for 12 months.[3] Preoperative GnRH agonist therapy can cause myoma degeneration causing obliteration of the interface between myoma and myometrium. It may also result in softening of small fibroids making their removal difficult.

Progesterone receptor modulators (PRMs)

Progesterone is an important hormone for growth of leiomyoma. Hence, progesterone antagonists can be used to treat fibroids medically. Progesterone receptor modualtors can be agonists, antagonists, or have mixed effects on fibroid tissues. SPRMs such as ulipristal acetate (UPA) and mifepristone have been tested in many trials and have proven advantageous in retaining fertility, improving symptoms in premenopausal women, preventing surgery and recurrence.[10]

Ulipristal Acetate (UPA)

Ulipristal acetate acts by blocking progesterone receptors and is usually given in a dose of 5 mg for 3 months in an intermittent therapy and is effective in reducing bleeding and anaemia in the patients with uterine fibroids. The treatment course can be repeated. Treatment should always start during the first week of the menstrual period.

The use has been restricted only for intermittent treatment of moderate to severe symptoms of uterine fibroids before menopause and when surgical procedures (including uterine fibroid embolisation) are not suitable or have failed. ***Ulipristal acetate 5mg should no longer be prescribed for controlling symptoms of uterine fibroids while waiting for surgical treatment.***

In November 2020, the Drugs Controller General of India (DCGI) suspended the manufacturing, sale or distribution of ulipristal acetate tablets 5 mg.

Non Surgical Alternatives

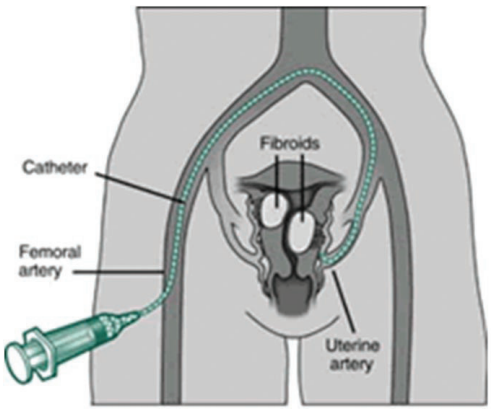
Uterine artery embolization

Uterine fibroid embolization (UAE) is an option for management of women who wish to preserve their uterus or avoid surgery because of medical or surgical risk factors. It is an interventional radiologic procedure in which one or both uterine arteries are occluded. In addition to shorter procedure, lesser blood transfusion rates and less recovery times, UAE is not limited by number of fibroids or presence of intra-abdominal adhesions. The most common complication is postoperative pain and

postembolization syndrome characterized by fever, pain and expulsion of fibroids vaginally. Failure of procedure leading to hysterectomy, premature menopause and decreased fertility outcome are other complications. In a study performed in 562 women from 1997-2001, one hundred women (18%) underwent hysterectomy after recurrence of symptoms after uterine artery embolization, and 32 (5.7%) had additional sparing procedures. The rate of hysterectomy at 5 years was 19.7%.[11,12] The American Family Physician association as per a review done in 2019 has found consistent that UAE is effective for reducing fibroid size and uterine volume.

Contraindications of UAE:

- Pregnancy
- Pelvic Inflammatory diseases
- Malignancies
- Immunocompromised states
- Extremely small or peduculated fibroids
- Renal diseases
- Coagulopathies
- Contrast allergy



Myolysis :

Myolysis is a minimally invasive procedure used for destruction of fibroids via a focused energy delivering system (heat, laser, or, magnetic resonance–guided focused ultrasound surgery (MRgFUS).

Radiofrequency ablation

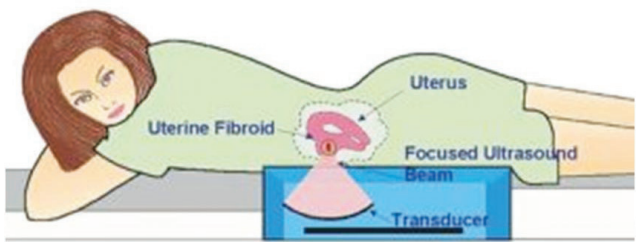
Laparoscopic radiofrequency ablation is considered as a minimally invasive treatment option for symptomatic fibroids in patients who want uterine preservation even though there is limited available data on reproductive outcomes.

Radiofrequency ablation (RFA) is delivered by a laparoscopic, transvaginal, or transcervical route, under ultrasound guidance to cause coagulative necrosis in targeted uterine leiomyomas. Although RFA is a reasonable option to consider for the treatment of symptomatic uterine leiomyomas, access to this technology is currently limited. Although laparoscopic is an FDA-approved treatment but studies on long term follow up and complications are limited thereby making it a lesser known treatment choice.[13]

Magnetic Resonace guided focused ultrasound (MRgFUS)

MRgFUS for symptomatic uterine fibroids is a safe and effective treatment option with the advantage of preserving the uterus. High-frequency ultrasound waves are used to denature proteins leading to cell necrosis and shrinkage of fibroids. MRI is used for mapping the fibroids and treatment is monitored by assessing the temperature of tissue subjected to treatment. Advantages include earlier recovery and very low morbidity, however it is used with guarded prognosis in women wishing to preserve fertility. Only women with fibroids located close to anterior abdominal wall with bowel interposition can be treated by this technology. Since one fibroid is targeted at one time the average treatment time may be long. Serious complications include skin burns, fibroid expulsion and persistent neuropathy.

The Food and Drug Administration approved this treatment in 2004, but the National Institute for Health and Care Excellence has not approved it yet.



Endometrial Ablation

Endometrial ablation is also a minimally invasive hysteroscopic procedure for women with uterine fibroids but evidence of it's efficacy is limited. However,it may be used in patients

who are unwilling for surgical management or in whom surgery can't be performed.[6] Endometrial ablation procedures may vary by the method used to destroy the endometrium like electrosurgery, cryosurgery, free flowing hot fluid, heated balloon, microwave and radiofrequency ablation.[14]

TABLE 1. Non Surgical Management Options for Uterine Fibroids

S no	Treatment	Mechanism of action	Advantages	Disadvantages	Fertility
1	Tranexamic acid	Antifibrinolytic	Decreased blood loss	No effect on fibroid size	Yes
2	NSAIDS and Mefenamic Acid	Prostaglandin inhibitors	Decrease in pain and blood loss	No effect on fibroid size	Yes
3	OCPs	Stabilises endometrium	Decreased blood loss	No effect on fibroid size, demands compliance	Yes, after cessation
4	Intrauterine Device (LNG-IUS)	Stabilises endometrium	Decreased blood loss,	mild effect on fibroid size	Yes, after removal
5	GnRH antagonists	Decreases bleeding	Decreased blood loss, operative and recovery time	Costly, hypoestrogenic effects	Yes
6	GnRH agonists	Size reduction	Decreased blood loss	Hypoestrogenic effects, return of symptoms after cessation of therapy	Yes
7	Progesterone receptor modulator	Size reduction	Decreased blood loss, operative and recovery time	liver failure with ulipristal	Yes, after cessation
	MINIMALLY INVASIVE				
8.	Radiofrequency Ablation	Coagulative necrosis	Decreased uterine volume and blood loss	Inconclusive evidence. Requirement of infrastructure and surgical expertise	Limited evidence
9.	Uterine artery embolization	Occlusion of blood supply	Shorter recovery	High chances of recurrence	Guarded prognosis
10	Myolysis by Focused energy delivery	In-situ destruction by heat/USG/laser	Minimally invasive and shorter recovery	High need of reintervention	Guarded prognosis
11	Endometrial ablation	Endometrial atrophy	Decreased blood loss	Inconclusive evidence	Limited evidence

Given that the threshold and preference for treatment is individual a patient centred shared decision-making approach should be used when devising a management strategy so that patients can make an informed decision that best meets their short term and long term goals.

References

1. Munro MG, Critchley HO, Broder MS, Fraser IS; FIGO Working Group on Menstrual Disorders. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynaecol Obstet. 2011 Apr;113(1):3-13. doi: 10.1016/j.ijgo.2010.11.011. Epub 2011 Feb 22. PMID: 21345435.
2. Lysteda- tranexamic acid tablet. US Food and Drug Administration (FDA) approved product information. Revised January, 2020. US National Library of Medicine. www.dailymed.nlm.nih.gov (Accessed on January 22, 2020).
3. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins–Gynecology. Management of symptomatic uterine leiomyomas: acog practice bulletin, number 228. Obstet Gynecol. 2021;137(6):e100-e115.
4. Yao X, Stewart EA, Laughlin-Tommaso SK, et al. Medical therapies for heavy menstrual bleeding in women with uterine fibroids: a retrospective analysis of a large commercially insured population in the USA. BJOG 2017; 124:322.
5. Sangkomkamhang US, Lumbiganon P, Pattanittum P. Progestogens or progestogen-releasing intrauterine systems for uterine fibroids (other than preoperative medical therapy). Cochrane Database Syst Rev 2020; 11:CD008994.
6. National Institute for Health and Care Excellence. Heavy menstrual bleeding: assessment and management [Internet]. [London]: NICE; 2018 [updated 2021 May 24; cited 2022 April 30]. (NICE guideline [NG88]). Available from: https://www.nice.org.uk/guidance/ng88.
7. https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/214846s000lbl.pdf (Accessed on May 07, 2022).
8. OriahnnTM (elagolix, estradiol, and norethindrone acetate capsules elagolix capsules). Highlights of prescribing information. Abbvie; 2020. Available at:

https://www. rxabbvie.com/pdf/oriahnn_pi.pdf (Level III)

9. Lethaby A, Puscasiu L, Vollenhoven B. Preoperative medical therapy before surgery for uterine fibroids. Cochrane Database Syst Rev. 2017 Nov 15;11(11):CD000547. doi: 10.1002/14651858.CD000547.pub2. PMID: 29139105; PMCID: PMC6486044.
10. Singh SS, Belland L, Leyland N et al. The past, present, and future of selective progesterone receptor modulators in the management of uterine fibroids. Am J Obstet Gynecol. 2018;218(6):563-572.e1.
11. Gabriel-Cox K, Jacobson GF, Armstrong MA, Hung YY, et al. Predictors of hysterectomy after uterine artery embolization for leiomyoma. Am J Obstet Gynecol 2007;196:588.e1-588.e6.
12. Manyonda I, Belli AM, Lumsden MA, Moss J, McKinnon W, Middleton LJ, et al. Uterine-artery embolization or myomectomy for uterine fibroids. FEMME Collaborative Group. N Engl J Med 2020;383:440–51. (Level I)
13. Bradley LD, Pasic RP, Miller LE. Clinical performance of radiofrequency ablation for treatment of uterine fibroids:systematic review and meta-analysis of prospective studies. J Laparoendosc Adv Surg Tech A 2019;29:1507–17.
14. Vilos GA, Allaire C, Laberge P, Leyland N, Vilos AG, Murji A, et al. The Management of Uterine Leiomyomas. Journal of Obstetrics and Gynaecology Canada. 2015 Feb;37(2):157-78.

Surgical Management of Fibroids

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Fibroids or leiomyomas are by far the commonest benign tumours in females arising from the genital tract. Majority are asymptomatic, but they can present with menorrhagia (30%), pelvic pain with or without dysmenorrhoea or pressure effects (34%), infertility (27%) or recurrent pregnancy loss (3%).[1] Submucous fibroids constitute 5-10% of all myomas and are the ones most likely to cause symptoms, as they encroach on the bleeding surface of the uterus and distort uterine cavity. Fibroids arise from the myometrium but can grow towards the serosa or the uterine cavity.

Women with fibroids can be offered expectant, medical or surgical treatment depending on their symptoms, the size, and the location of the fibroid/s. However, surgery provides more effective and lasting relief in symptoms. Surgical treatment can be essentially divided into radical or definitive surgery like hysterectomy, and conservative surgical procedures with the aim of retaining a functional uterus and/or fertility. Hysterectomy can be performed via abdominal, vaginal, laparoscopic, or robotic approach. Conservative surgical treatments include myomectomy (laparoscopic, open, hysteroscopic), laparoscopic uterine artery occlusion, laparoscopic myolysis, and endometrial ablation. This article will focus on hysterectomy and myomectomy, which are the two commonest surgeries performed for the treatment of fibroids.

Hysterectomy

Hysterectomy is the definitive surgical treatment for fibroids offered to most women beyond 40 years of age not desiring fertility. Hysterectomy has been the mainstay of surgical treatment since a long time, accounting for up to three-quarters of all surgical intervention for fibroids.[2] It provides complete relief in symptoms with high satisfaction scores, particularly in women with bleeding issues, albeit at the cost of significant morbidity and healthcare cost. The incidence of hysterectomy has however come down gradually as a variety of hormonal and other less invasive techniques are now available for the treatment of fibroids. In a population-based study from Finland, the incidence of hysterectomy decreased from 23% during the period 1998-2001 to 12% in 2014-2017.[3]

Choosing the route of hysterectomy

Vaginal hysterectomy is the most favorable route for the patient in terms of postoperative recovery. However, the feasibility of a non-descent vaginal hysterectomy with fibroid uterus largely depends on the expertise of the operating surgeon, and the overall size of the uterus and the myomas. Laparoscopic (with or without robotic assistance) should be the next choice, where vaginal hysterectomy is not feasible, provided the expertise for laparoscopic hysterectomy is available. Laparoscopic or robotic hysterectomy provide similar outcome for the patient.[4] However, the cost of robotic assisted hysterectomy is considerably more than laparoscopic without any added advantage to the patient. Laparoscopic hysterectomy should be therefore preferred over robotic-assisted hysterectomy.[5] In both these approaches, morcellation (scalpel or power morcellation) would be required in case of a large uterus that cannot be delivered vaginally. With large fibroids in women more than 50 years of age who have a greater risk of leiomyosarcoma,[6] abdominal hysterectomy without morcellation may be the safest technique of hysterectomy.

Myomectomy

Myomectomy should be offered to women desiring future fertility. Additionally, pre-menopausal women who have completed their family but wish to retain their uterus, are also candidates for myomectomy. Pros and cons of hysterectomy versus myomectomy should be discussed with the patients to help them reach an informed decision. Myomectomy can be performed via the abdominal, laparoscopic with or without robotic assistance, or hysteroscopic.

Most intramural and subserous fibroids can be removed either laparoscopically or open. Fibroids partially or entirely in the uterine cavity, type 0 and 1, and some type 2, can be removed by the hysteroscopic approach.

Open myomectomy

It is the conventional method of removing fibroids. Bleeding is the most important intraoperative complication during myomectomy that worries the surgeon. Vasopressin injection into the fibroid capsule is the most commonly used intervention currently, both in open and laparoscopic procedures, to reduce blood loss during myomectomy. The older methods of applying pressure on uterine arteries using Bonney's clamp or tourniquets to reduce bleeding have been superseded by uterine artery occlusion using suture or clips, though it is only required in few complicated myomectomies. The basic principles of myomectomy still hold, which include preferably a vertical incision on anterior uterine surface, tunneling to remove multiple fibroids through minimum incisions, and avoid posterior incision as far as possible.

Laparoscopic myomectomy

It has replaced many a open procedures as advantages of minimally invasive surgery make it an attractive alternative to conventional surgery. However, bleeding is of even greater concern in laparoscopic procedures since one cannot use direct pressure to stop bleeding as in open surgery.

Haemostasis during myomectomy

Vasopressin has revolutionized laparoscopic myomectomy since it provides a near bloodless field for about 45-60 minutes to complete enucleation and suturing of the myoma bed. Vasopressin is a strong vasoconstrictor, and an intramyometrial injection causes significant reduction in intraoperative blood loss. A randomized trial compared dilute versus concentrated injection of vasopressin during laparoscopic myomectomy. 10 units of vasopressin was administered in both arms, one received 200 ml of dilute vasopressin (20 units in 400 ml = 0.05U/ml)) and the other received 30 ml of concentrated vasopressin (20 units in 60 ml = 0.3U/ml). The intraoperative blood loss was similar in both groups of patients, and no adverse events noted in either group.[7] Nevertheless serious side effects have been reported even at low dose and dilutions. Systemic absorption is known to cause profound bradycardia, loss of peripheral pulses, hypotension and significant cardiac complications, including cardiac arrest. Sudden cardiac arrest was reported in a healthy woman after an intramyometrial injection of a total dose of 11 units of vasopressin in a dilution of 0.2 U/mL.[8] Another case report described acute pulmonary edema which developed after intramyometrial injection of 20 units vasopressin diluted in 20 ml (1 U/ml).[9] Given the fact that no safe total dose and dilution have been clearly demonstrated, and dilute vasopressin is shown to be as effective as concentrated, it is prudent to use lower dose of vasopressin in higher dilution, so that total dose absorbed systemically remains low. Twenty units of vasopressin can be diluted in 200-400 ml of normal saline to give a concentration of 0.05-0.1 U/ml and a total dose of 5-10 units would hopefully avoid any adverse events. Also, a preoperative evaluation must exclude any pre-existing cardiac condition in such patients.

Vaginal and rectal misoprostol have also been used to reduce blood loss. Vaginal misoprostol 400 mcg given one hour before surgery was found to reduce blood loss when compared to no haemostatic used but less effective compared to vasopressin.[10] It has an additive effect on reduction in blood loss when administered together with vasopressin.[11]

Laparoscopic uterine artery occlusion may be performed prior to myomectomy in selected cases to reduce blood loss and increase the chances of successful laparoscopic myomectomy.[12]

The controversy of Power morcellation

In 2013, the Wall Street Journal reported the case of Amy Reed, an anaesthetist who underwent hysterectomy for fibroids and was 'inadvertently' found to have an leiomyosarcoma (LMS) post-procedure, which was up-staged as a result of the use of power morcellation.[13] This was followed by a strong media campaign which led the FDA to issue a safety communication to health care professionals in April 2014. The

statement was as follows:[14]

"If laparoscopic power morcellation is performed in women with unsuspected uterine sarcoma, there is a risk that the procedure will spread the cancerous tissue within the abdomen and pelvis, significantly worsening the patient's likelihood of long-term survival. For this reason, and because there is no reliable method for predicting whether a woman with fibroids may have a uterine sarcoma, the FDA discourages the use of laparoscopic power morcellation during hysterectomy or myomectomy for uterine fibroids."

The FDA quantified the risk of sarcoma in women who underwent hysterectomy/ myomectomy at 1:352 and the risk of LMS at 1:498, which were later revised to 1:225-1:580 and 1:495-1:1,100 respectively.[15] The incidence of LMS has been since reported from different countries. In a report from China which looked at records over 10 years from 2008 to 2017, out of 9556 women, 28 had LMS giving a prevalence of uterine LMS as 0.29% or 1:345. Of these, when no malignancy was suspected preoperatively occult LMS were found in 0.07% or 1:1429. The prevalence of overall and occult LMS significantly increased after 50 years of age.[16] A Dutch nationwide study for 15 years (2000-2015) showed an overall incidence of uterine LMS as 0.25% or 1:400 patients. The incidence of unexpected LMS was 0.12% or 1:865 patients. The risk was low in premenopausal women and highly uncommon in women under 40 years.[17]

This advisory from FDA led to a reduction in the use of minimally invasive surgery and an increase in abdominal operations for fibroids for obvious reasons. This increased the complications due to open surgery. According to recent guidelines from American College of Obstetricians and Gynecologists (ACOG),[18] the risk of unexpected leiomyosarcoma is uncertain, but estimates range from 1 in 498 to less than 1 in 10,000. The risk of malignancy is higher in postmenopausal and women older than 50 years. Therefore, the risk of morcellation of an undiagnosed LMS in a patient should be weighed against increased morbidity due to abdominal surgery, and decision should be based on a shared decision between the patient and the surgeon.

To obviate the risk of upstaging an occult LMS due to use of power morcellator, in-bag morcellation has been recommended. A variety of intraperitoneal bags for contained morcellation are available. The use of bags is however cumbersome, there is a learning curve and potential problems and consequently, increased operative time.

An updated safety communication from FDA was issued in December 2020 which stated:[19]

- The FDA continues to recommend limiting the use of laparoscopic power morcellation to certain appropriately selected women undergoing myomectomy or hysterectomy; when morcellation is appropriate, only contained morcellation should be performed.
- Do not use laparoscopic power morcellators in gynecologic surgery when the tissue to be morcellated is known or suspected to contain malignancy.
- Do not use laparoscopic power morcellators for removal of uterine tissue containing suspected fibroids in patients who are post-menopausal or over 50 years of age.
- Tell patients about the risk of occult cancer (cancer that cannot be identified during pre-treatment evaluation) and inform them that use of laparoscopic power morcellators during fibroid surgery may spread cancer and decrease their long-term survival.
- Tell patients that while unsuspected cancer can occur at any age, the risk of occult cancer, including uterine sarcoma, increases with age, particularly in women over 50 years of age.
- A containment system cannot prevent against the potential spread of cancer that might result from manipulation of the tissue before it is placed into the tissue containment system or cancer that may have already spread through the blood, lymphatic system, or fallopian tubes before the surgical procedure.

Preoperative evaluation for diagnosing LMS

Women older than 40 years for myomectomy or hysterectomy should be evaluated carefully to exclude LMS. Although there is no method to accurately diagnose LMS preoperatively, a

scoring system based on clinical characteristics has been proposed to help in making a preoperative diagnosis of LMS in fibroid uterus.[20] A score of ≥4 points was a useful predictor in differentiating LMS from fibroid.

Table 1: Preoperative clinical characteristics scoring system for differentiating uterine LMS from fibroid[20]

Score	0	1	2
Age (years)	< 40	≥ 40	-
myoma size (cm)	< 7	-	≥ 7
NLR	< 2.8	≥ 2.8	-
LDH	< 193	-	≥ 193
Platelet x10^9/L	< 298	≥ 298	-

NLR neutrophil-to-lymphocyte ratio, LDH lactate dehydrogenase

ACOG suggests that MRI and LDH may be done preoperatively to exclude LMS, though the positive predictive value is low.[18]

Hysteroscopic myomectomy

Hysteroscopic myomectomy is now the standard of care and 'gold standard' for treatment of submucous myomas. It has the advantage of natural orifice surgery which results in less pain and shorter postoperative recovery. Abnormal uterine bleeding is the commonest indication for hysteroscopic myomectomy followed by infertility.

A good preoperative evaluation using ultrasound, and MRI if required, must be done to assess the feasibility and difficulty level of hysteroscopic myomectomy. This evaluation must include the following:

- Size of fibroid
- Location of fibroid
- Single or multiple
- Extent of fibroid in the cavity and in the myometrium
- Distance of fibroid from the serosal surface (myometrial free margin)

Classification of submucous fibroids

The classification of submucous fibroids is important to decide whether the fibroid is suitable for hysteroscopic approach, and if so, what is the probability of completing surgery in one sitting. The earliest classification developed by Wamsteker et al in 1993[21] and adopted by European Society of Gynaecological Endoscopy (ESGE)[22] is still used widely (Table1).

Table 1: ESGE classification of submucous fibroids[22]

Type 0	Entirely within endometrial cavity No myometrial extension
Type I	<50% myometrial extension <90° angle of myoma surface to uterine wall
Type II	≥50% myometrial extension ≥90° angle of myoma surface to uterine wall

Since the ESGE classification was based solely on the degree of myometrial extension, and did not take into account the size and other parameters which determine the feasibility and the level of difficulty of hysteroscopic myomectomy, Lasmar in 2005 proposed the STEPW classification which addressed these issues.[23] Besides the myometrial extension which is the same as in the ESGE classification, it gives a score for the size of fibroid, the extent of the uterine cavity it is involving, the topography or the location of fibroid in lower, mid or upper part of the cavity, giving an additional score for fibroids situated on the lateral wall (Table 2). The total score obtained is supposed to correlate with the level of operative difficulty and the probability of complete surgery in a single sitting (Table 3).

Table 2: STEPW classification of submucous fibroids[23]

	Size (cm)	Topography	Extension of the base	Penetration	Lateral Wall	Total
0	< 2	Low	< 1/3	0	+ 1	
1	2 to 5	Middle	<1/3 – 2/3	< 50%		
2	> 5	Upper	> 2/3	> 50%		
Score	+	+	+	+	+	=

Table 3: Lasmar score and suggested surgical procedure[23]

Score	Group	Suggested treatment
0 to 4	I	Low complexity hysteroscopic myomectomy
5 to 6	II	Complex hysteroscopic myomectomy Consider GnRH use and/or two-stage surgery
7 to 9	III	Recommend an alternatives non-hysterosocpic technique

Preoperative hormonal treatment

Small Grade 0 fibroids can be generally resected without any preoperative treatment. However, bigger size fibroids benefit by preoperative treatment as it leads to reduction in size and vascularity of fibroids. Besides the effect

on fibroid, agents like GnRH analogues and danazol also induce endometrial atrophy which improves vision on hysteroscopy. Consequently, preoperative treatment increases the ease of surgery, reduces operative time, intra-operative bleeding and fluid absorption. As most therapeutic agents used for this purpose induce amenorrhoea or hypomenorrhoea, treatment also helps by improving symptoms of bleeding and hematological indices.

Surgical techniques

Resection of myoma involves slicing the myoma or taking off chips till a level flush with the endometrial cavity is reached. The procedure is therefore most suitable for grade 0 myomas which are entirely in the uterine cavity. Technically grade 0 fibroids upto 5 cm can be taken up for hysteroscopic myomectomy, but it is desirable to use preoperative hormonal treatment when fibroids are more than 3 cm to reduce the size and vascularity of fibroids, and consequently the operative time and intraoperative bleeding.

Myomas with significant myometrial extension require a much higher level of surgical expertise and operator experience. In grade 1 or 2 myomas, the myoma is resected upto the level of endometrial lining. The myomectomy is then completed in the second sitting which can be planned 1-2 months later, so that the myometrial part of the myoma gets extruded into the cavity, and can be resected completely. Optionally GnRH analogues can be used before the first surgery and immediately after. One or two doses can be given four weeks apart, and the second surgery planned accordingly. In an effort to complete surgery in one step, manual massage of the uterus and pharmacological agents like oxytocin, methyl ergometrine, prostaglandin F 2-alpha have been used intraoperatively after shaving the intracavitary part of the fibroid, to facilitate the extrusion of the rest of the myoma into the uterine cavity. After the first part of resection is completed, the resectoscope is withdrawn, uterine massage and/or an oxytocic agent is given and the resectoscope is re-inserted after a lapse of 3-5 minutes. Conventionally, G1 and G2 fibroids bigger than 5-6 cm and 4-5 cm respectively should not be taken up for hysteroscopic myomectomy,[24] even though one can find reports in the literature of removing much larger myomas.

Office hysteroscopy. Small myomas <1.5 cm with minimal intramural component can be removed without analgesia or anaesthesia by using the operative hysteroscope with 5 Fr instruments like scissors, grasping forceps, unipolar and bipolar electrodes. The fibroid is first enucleated by mechanical instruments and then sliced into small fragments using unipolar or bipolar electrode.[25]

Intrauterine morcellation. Small myomas can also be morcellated inside the uterine cavity. A variety of hysteroscopic morcellators or hysteroscopic tissue removal (HTR) systems are now available for hysteroscopic myomectomy.

Complications

Early or immediate complications of operative hysteroscopy include perforation, bleeding, fluid overload, thermal injury with the return electrode, infection, and complications due to poor patient positioning and anaesthesia. Late complications include intrauterine adhesions, and pregnancy related problems like uterine rupture and placenta accreta.

Hysterectomy versus myomectomy

Hysterectomy is usually performed in older women with longer duration of symptoms. In such women, better quality of life scores have been reported after hysterectomy.[26] However, hysterectomy particularly in younger premenopausal women is associated with considerable health hazards which must be considered when making a decision to remove or retain the uterus. Hysterectomy has been found to be associated with accelerated menopause. In a prospective study in premenopausal women followed for five years, 20.6% women who had hysterectomy with ovarian conservation reached menopause in 5 years compared to 7.3% in non-hysterectomized women. Menopause was earlier when unilateral oophorectomy was performed compared to women who had both ovaries.[27] Besides losing fertility, hysterectomy in young women has been found to be associated with an increased long-term risk of de novo depression and anxiety, regardless of the indication for hysterectomy.[28] A systematic

review including 29 studies on the long term risks of hysterectomy showed an increased risk of cardiovascular disease and certain cancers notably thyroid cancer, renal cell carcinoma, bladder and urinary tract cancer.[29]

References

1. Lethaby A, Vollenhoven B. Fibroids (uterine myomatosis, leiomyomas). BMJ Clin Evid. 2015 Jun 2;2015. pii: 0814.
2. Stewart EA, Laughlin-Tommaso SK, Catherino WH, Lalitkumar S, Gupta D, Vollenhoven B. Uterine fibroids. Nat Rev Dis Primers. 2016 Jun 23;2:16043.
3. Hakkarainen J, Nevala A, Tomás E, Nieminen K, Malila N, Pitkäniemi J, Auranen A. Decreasing trend and changing indications of hysterectomy in Finland. Acta Obstet Gynecol Scand. 2021 Sep;100(9):1722-1729.
4. Albright BB, Witte T, Tofte AN, Chou J, Black JD, Desai VB, Erekson EA. Robotic Versus Laparoscopic Hysterectomy for Benign Disease: A Systematic Review and Meta-Analysis of Randomized Trials. J Minim Invasive Gynecol. 2016 Jan;23(1):18-27.
5. Ngan TYT, Zakhari A, Czuzoj-Shulman N, Tulandi T, Abenhaim HA. Laparoscopic and Robotic-Assisted Hysterectomy for Uterine Leiomyomas: A Comparison of Complications and Costs. J Obstet Gynaecol Can. 2018 Apr;40(4):432-439.
6. Siedhoff MT, Doll KM, Clarke-Pearson DL, Rutstein SE. Laparoscopic hysterectomy with morcellation vs abdominal hysterectomy for presumed fibroids: an updated decision analysis following the 2014 Food and Drug Administration safety communications. Am J Obstet Gynecol. 2017 Mar;216(3):259.e1-259.e6.
7. Cohen SL, Senapati S, Gargiulo AR, Srouji SS, Tu FF, Solnik J, Hur HC, Vitonis A, Jonsdottir GM, Wang KC, Einarsson JI. Dilute versus concentrated vasopressin administration during laparoscopic myomectomy: a randomised controlled trial. BJOG. 2017 Jan;124(2):262-268.
8. Hobo R, Netsu S, Koyasu Y, Tsutsumi O. Bradycardia and cardiac arrest caused by intramyometrial injection of vasopressin during a laparoscopically assisted myomectomy. Obstet Gynecol. 2009 Feb;113(2 Pt 2):484-486.
9. Barcroft JF, Al-Kufaishi A, Lowe J, et al. Risk of vasopressin use: a case of acute pulmonary oedema, post intramyometrial infiltration of vasopressin in laparoscopic myomectomy. BMJ Case Reports CP 2019;12:e231331.
10. Protopapas A, Kathopoulis N, Chatzipapas I, Athanasiou S, Grigoriadis T, Samartzis K, Kypriotis K, Vlachos DE, Zacharakis D, Loutradis D. Misoprostol vs vasopressin as a single hemostatic agent in laparoscopic myomectomy: Comparable, or just better than nothing? J Obstet Gynaecol Res. 2020 Nov;46(11):2356-2365.
11. Srivastava S, Mahey R, Kachhawa G, Bhatla N, Upadhyay AD, Kriplani A. Comparison of intramyometrial vasopressin plus rectal misoprostol with intramyometrial vasopressin alone to decrease blood loss during laparoscopic myomectomy: Randomized clinical trial. Eur J Obstet Gynecol Reprod Biol. 2018 Sep;228:279-283.
12. Peng Y, Cheng J, Zang C, Chen X, Wang J. Comparison of Laparoscopic Myomectomy with and without Uterine Artery Occlusion in Treatment of Symptomatic Multiple Myomas. Int J Gen Med. 2021 May 5;14:1719-1725.
13. Levitz J. Fibroid Surgery Puts Doctor Fighting Cancer Diagnosis in Spotlight. Wall Street Journal.2013. Available at: https://www.wsj.com/articles/fibroid-surgery-puts-doctor-fightingcancer-diagnosis-in-spotlight-138745
14. Laparoscopic Uterine Power Morcellation in Hysterectomy and Myomectomy: FDA Safety Communication. Available at: http://wayback.archive-it.org/7993/20170722215731/https://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm393576.htm
15. Odejinmi F, Aref-Adib M, Liou N, Sideris M, Mallick R. Rethinking the Issue of Power Morcellation of Uterine Fibroids: Is Morcellation the Real Problem or Is this Another Symptom of Disparity in Healthcare Provision? In Vivo. 2019 Sep-Oct;33(5):1393-1401.
16. Wang L, Li S, Zhang Z, Jia J, Shan B. Prevalence and occult rates of uterine leiomyosarcoma. Medicine (Baltimore). 2020 Aug 14;99(33):e21766.
17. van den Haak L, de Kroon CD, Warmerdam MI, Siebers AG, Rhemrev JP, Nieboer TE, Jansen FW. Incidence and groups at risk for unexpected uterine leiomyosarcoma: a Dutch nationwide cohort study. Arch Gynecol Obstet. 2019 Jan;299(1):159-165.
18. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins–Gynecology. Management of Symptomatic Uterine Leiomyomas: ACOG Practice Bulletin, Number 228. Obstet Gynecol. 2021 Jun 1;137(6):e100-e115.
19. UPDATE: Perform Only Contained Morcellation When Laparoscopic Power Morcellation Is Appropriate: FDA Safety Communication. Available at: https://www.fda.gov/medical-devices/safety-communications/update-perform-only-contained-morcellation-when-laparoscopic-power-morcellation-appropriate-fda
20. Zhang G, Yu X, Zhu L, Fan Q, Shi H, Lang J. Preoperative clinical characteristics scoring system for differentiating uterine leiomyosarcoma from fibroid. BMC Cancer. 2020 Jun 3;20(1):514.
21. Wamsteker K, Emanuel MH, de Kruif JH. Transcervical hysteroscopic resection of submucous fibroids for abnormal uterine bleeding: results regarding the degree of intramural extension. Obstet Gynecol. 1993 Nov;82(5):736-40.
22. American Association of Gynecologic Laparoscopists (AAGL): Advancing Minimally Invasive Gynecology Worldwide. AAGL practice report: practice guidelines for the diagnosis and management of submucous leiomyomas. J Minim Invasive Gynecol. 2012 Mar-Apr;19(2):152-71.
23. Lasmar RB, Barrozo PR, Dias R, Oliveira MA. Submucous myomas: a new presurgical classification to evaluate the viability of hysteroscopic surgical treatment--preliminary report. J Minim Invasive Gynecol. 2005 Jul-Aug;12(4):308-11.
24. Di Spiezio Sardo A, Mazzon I, Bramante S, Bettocchi S, Bifulco G, Guida M, Nappi C. Hysteroscopic myomectomy: a comprehensive review of surgical techniques. Hum

Reprod Update. 2008 Mar-Apr;14(2):101-19.

25. Bettocchi S, Ceci O, Di Venere R, Pansini MV, Pellegrino A, Marello F, Nappi L. Advanced operative office hysteroscopy without anaesthesia: analysis of 501 cases treated with a 5 Fr. bipolar electrode. Hum Reprod. 2002 Sep;17(9):2435-8.
26. Wallace K, Zhang S, Thomas L, Stewart EA, Nicholson WK, Wegienka GR, Wise LA, Laughlin-Tommaso SK, Diamond MP, Marsh EE, Jacoby VL, Anchan RM, Venable S, Larry GM, Lytle B, Wang T, Myers ER. Comparative effectiveness of hysterectomy versus myomectomy on one-year health-related quality of life in women with uterine fibroids. Fertil Steril. 2020 Mar;113(3):618-626.
27. Farquhar CM, Sadler L, Harvey SA, Stewart AW. The association of hysterectomy and menopause: a prospective cohort study. BJOG. 2005 Jul;112(7):956-62.
28. Laughlin-Tommaso SK, Satish A, Khan Z, Smith CY, Rocca WA, Stewart EA. Long-term risk of de novo mental health conditions after hysterectomy with ovarian conservation: a cohort study. Menopause. 2020 Jan;27(1):33-42.
29. Madueke-Laveaux OS, Elsharoud A, Al-Hendy A. What We Know about the Long-Term Risks of Hysterectomy for Benign Indication-A Systematic Review. J Clin Med. 2021 Nov 16;10(22):5335.

Fibroids in Pregnancy

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Introduction

Uterine fibroids arise from the proliferation of smooth muscle cells of the uterus and are the commonest benign tumors of the female reproductive tract. As they are common in women of reproductive age, hence are encountered during pregnancy as well, but are symptomatic only in few. The prevalence of uterine fibroids during pregnancy is reported to range from 1.6 to 10.7%.[1]

Symptoms

Only about 10-20 % of fibroids present with symptoms during pregnancy. Pain is most commonly associated, which may be due to its rapid expansion in size in late first or early second trimester.[2] During the course of rapid expansion, pressure on the supplying blood vessels leads to ischemic necrosis causing acute pain. Severe pain may also be due to torsion of sub serosal or pedunculated fibroids. Pelvic pressure symptoms or vaginal bleeding may also occur rarely.[2]

Effect of Pregnancy on Fibroid

Antepartum: The size of fibroid remains nearly same across gestation in 50 to 60% of cases, it increases in 22 to 32% and decreases in 8 to 27% cases.[3] The pregnancy related growth in size of fibroids is largely attributed to the hormonal changes occurring during pregnancy. While estrogen is the hormone responsible for promoting uterine growth, progesterone is thought to be the hormone for maintaining the size of these tumors.[4]

However, these two hormones do not seem to be the only ones involved. This is because the growth of uterine fibroid does not follow the same pattern of progressively increasing serum levels of estrogen and progesterone[4] Fibroids are known to shrink in size during second and third trimesters.[5] The rapid increase in serum hCG occurring during the initial pregnancy may be responsible for the initial increase in size of the uterine fibroid noted during early pregnancy. Larger fibroids (>5 cm in diameter) are more likely to enlarge, whereas smaller fibroids are more likely to remain stable in size.[6]

Women with large fibroids should undergo serial growth scans as symphysio fundal height measurements are inaccurate. Regular USG surveillance will also allow identification of rapidly enlarging fibroids, those that appear suspicious of malignancy. Anemia should be corrected prior to delivery to prevent complication like postpartum hemorrhage and need for blood transfusion. Any women with pregnancy with known fibroid when presents with acute abdominal pain, a possibility of red degeneration or torsion should be considered.

Red degeneration of fibroid in pregnancy

Red degeneration (necrobiosis) is a form of degeneration that occurs characteristically but not exclusively in pregnancy, and the process presents with clinical symptoms of abdominal pain, vomiting and fever. The exact mechanism is not known, but it results due to decreased blood supply leading to diminished oxygen delivery. Besides, peripheral venous obstruction persuades hemorrhagic infarction and necrosis of the tumor. Differential diagnosis would be threatened miscarriage, acute appendicitis or ovarian cyst torsion. Management includes bed rest and observation, symptomatic therapy by analgesics in case of pain, intensive fetal surveillance, and surgery in the acute situations.[7]

Effect of fibroid on pregnancy

There may be a slightly increased risk of obstetric complications, such as early pregnancy loss, preterm labor and birth, fetal malpresentation, and placental abruption, particularly in patients with multiple fibroids, retroplacental fibroids, and size greater than 5 cm. Pain is often the presenting symptom that warrants searching

for complications of uterine fibroids.[8]

Ischemic necrosis and prostaglandin release can lead to pain and contractions in patients with big fibroids. Other mechanisms involved include mechanical effects of uterine fibroids on fetal sac. Lower-located fibroids (i.e., near cervix) might result in obstructed labor, submucosal fibroids are associated with higher miscarriage rates, and large-sized fibroids (>5 cm) are associated with uterine cavity distortion, abnormal fetal position, and presentation.[2, 3, 9]

Complications in pregnancy

Overall complications include breech presentation (13%), pre-term labor (19%), cesarean delivery (49%), and abortion (8%). Other complications include- antenatal hemorrhage, postpartum hemorrhage, abruptio placentae, and labor dystocia.[8,10]

The first trimester submucosal fibroids can double the risk of abortion in about 14 % women as compared to 7.6% in otherwise healthy women. The main determinant for abortion is the location of the fibroid. Abortion was reported to be 8 times more common among women with retroplacental fibroids than those with non-retroplacental fibroids.[10]

Fibroids have been associated with increased risk of placenta previa. Prior hysteroscopic removal of a submucosal fibroid may increase the risk of placenta accreta spectrum. Although the risk of placenta accreta spectrum after prior laparoscopic myomectomy appears to be low, data regarding this is sparse. Ultrasound evaluation for possible placenta accreta in the late second or early third trimester can be done.

The fetal anomalies noted with uterine fibroids were congenital torticollis, head deformities, and limb reduction defect. Pooled cumulative data suggest that fibroids do not increase the risk of preterm prelabor rupture of membranes and may even slightly decrease the risk.[9]

External cephalic version (ECV) is not contraindicated in uterine fibroids and this may be considered in women with malpresentation.[11]

Management

Role of preconception myomectomy

Decisions regarding preconception myomectomy should be made on case-to-case basis and depends on several factors, including the age of the patient, past reproductive history, severity of symptoms, size and location of the fibroids. Time interval between myomectomy and subsequent conception following open myomectomy should be atleast 12 weeks after the procedure and 6-month after a laparoscopic myomectomy.

Management of fibroids in pregnancy

Management of fibroids in pregnancy depends upon the symptoms and period of gestation. Asymptomatic fibroids have to be managed conservatively. Acetaminophen can be given for pain relief and other NSAID can be given if pain is severe.

It is rare for fibroids to be treated surgically in the first half of pregnancy. In patients with a prolapsed fibroid, with clinically significant bleeding, unmanageable pain, urinary retention, or infection, transvaginal resection is reasonable.

Myomectomy during pregnancy

Several studies have reported that antepartum myomectomy can be safely performed in the first and second trimester of pregnancy in symptomatic fibroids.[12]

Indications - Acceptable indications include intractable pain from a degenerating fibroid especially if it is subserosal or pedunculated, a large or rapidly growing fibroid.[12] The histopathology revealed necrosis and degeneration as the main findings in the removed fibroids. In a recent systematic review of 54 articles including 97 patients by Spyropoulou et al on myomectomy during pregnancy, abdominal pain, not responding to medical treatment was found to be the most common indication for surgery and majority of removed fibroids were pedunculated, subserous or fundal.[13] The median gestational age at myomectomy was 16 weeks. Laparotomy under general anaesthesia was the most common procedure, followed by laparoscopy and vaginal myomectomy. The uterine scar was mainly closed in two layers by vicryl suture. The postoperative course was uneventful in majority of them and they were discharged at a median of five days.[13] Regarding adverse outcomes, few cases of miscarriages have been

reported but significant number of women go into spontaneous labor and deliver vaginally at term, with optimal neonatal outcomes. There was no increase in adverse outcomes including miscarriage, premature membrane rupture or low Apgar score in multiple compared to single myomectomy.[12] The rate of caesarean section is increased following antenatal myomectomy probably on account of the reports of the potential risk of uterine rupture in some studies

Delivery

Choosing the route of delivery — Most patients with fibroids will have a successful vaginal birth and thus should be offered a trial of labor. Caesarean birth is reserved for standard obstetric indications (malpresentation or failure to progress) or if there are concerns that fetal descent would be obstructed by a fibroid. Caesarean section may also be indicated in a previous extensive or complicated myomectomy. Oxytocin infusion, ergometrine injection and balloon tamponade are kept ready to manage any excessive bleeding after delivery.

Precaution during LSCS – Every effort should be made to avoid cutting through fibroids at caesarean birth as it can be impossible to close the incision site if the fibroids are in it.[14] A distance of 2 cm is considered safe.

Women with a previous myomectomy should probably be delivered by cesarean prior to the onset of labor, particularly if the uterine cavity was entered.

Myomectomy during cesarean section

Undertaking simultaneous myomectomy during caesarean section has an advantage of avoiding complications that might result from re-operation for future leiomyoma removal. The reasons behind the reluctance to do a combined operation in the past were based on fear of postpartum complications, such as increased haemorrhage, fever, and adhesions, with increase in experience in dealing with such cases more indications have been suggested in the recent reports.

Indication - Earlier, the indications of myomectomy at the time of caesarean section were to facilitate safe delivery of the fetus or for difficulty in the closure of the incision and the presence of pedunculated subserosal fibroids .[14] But with increasing clinical experience and expertise it has been performed safely in clinical situations such as symptomatic myomas, myoma more than 5 cm, in solitary, and anteriorly located myomas if the patient desires after understanding the risks involved. The contraindications are- age more than 40 years, multiple myomas, posterior or cornual location of the myoma.[15]

Careful counselling regarding the possible complications such as haemorrhage or infection, need to be discussed with patient and family before undertaking the combined operation.[16]

Fibroids may not be removed completely at caesarean myomectomy compared to myomectomy in the non-pregnant state, with the possibility of repeat surgery later.

Patient's characteristics, such as age, previous delivery history, gestational age at delivery, birthweight and the parameters of leiomyoma, including size, number, and location, needs to be evaluated.

If clinically indicated, national guidelines from Canada now support both antenatal myomectomy and caesarean myomectomy.[17]

Removal of fibroid exceeding 8 cm or located in the lower uterine segment at the time of caesarean section has been shown to be significantly associated with intraoperative haemorrhage and are therefore to be avoided.[14]

Technique[16]:

- It is performed under general anaesthesia, the Munro-Kerr technique is used for performing CS.
- Two 16-gauge intravenous (IV) cannulas are inserted in before induction of anaesthesia.
- An IV infusion of 1000mg tranexamic acid is given just before induction of anaesthesia.
- After Foley's catheterization tab 400mg misoprostol is inserted rectally after anaesthesia
- Pfannenstiel incision is given over the abdomen followed by a transverse incision on the uterus, away from the myoma as much as possible.
- Active management of third stage is done,

oxytocin is administered as the fetus is extracted, the umbilical cord clamped and cut, and the placenta is removed after separation.

- The uterus is exteriorized through the abdominal incision.
- The uterine artery is ligated bilaterally then a longitudinal linear uterine incision is given for the removal of the myoma by enucleation, the dead space is closed and the overlying serosa is closed by continuous suture.
- The uterine transverse incision is then repaired.
- A wide bore drain is inserted in the pouch of Douglas, and the abdominal wall is closed in layers.
- At the event of an intraoperative intractable haemorrhage, bilateral ligation of the anterior division of the internal iliac artery (IIA) is performed. Hysterectomy is done if the intractable haemorrhage continues after bilateral ligation of the IIA.
- The measurement of blood loss and the IV infusion of fluids and blood products are also strictly followed.
- Another 400 mg misoprostol is inserted rectally postoperatively and the oxytocin infusion was continued for 24 h.

Complications such as haemorrhage, infection are minimal in expert hands and in carefully selected patients. Incomplete removal of multiple fibroids at caesarean myomectomy and further risk of recurrence is common as compared to myomectomy done in the nonpregnant state.

Postpartum – Almost 90% of patients with fibroids detected in the first trimester will have regression in total fibroid volume when re-evaluated three to six months postpartum, but in 10% volume might increase.[18] Regression may be less in patients using progestin-only contraception.

Women who deliver with fibroid uterus in situ are rarely at risk of a fatal condition called pyomyoma (suppurative leiomyoma). This condition results from infarction, necrosis and secondary infection of fibroids with common organisms such as Clostridium. It presents with a classical triad of symptoms, including pain abdomen, sepsis without any obvious source of bacteremia and a history of leiomyoma. The management includes constant monitoring for the signs of infection, ultrasound examination of fiboid, antibiotics and resuscitative measures if any required. Rupture of degenerated fibroids in the postpartum period can also occur. Hence when in acutely symptomatic patient ultrasound reveals a large hyperechoic mass on the uterine wall and free fluid within the pelvis pyomyoma should be suspected. Definite diagnosis and treatment are achieved by laparotomy with either myomectomy or hysterectomy. Computed tomography guided drainage of pyomyoma is also possible.[19]

Summary and conclusion

- Course of pregnancy is not linear during pregnancy, most of it occurs in the first trimester, with little if any further increase in size during the second and third trimesters.
- Most patients do not have any complications related to the fibroids during pregnancy.
- Size and location appear to be risk factors for pregnancy complications: Large size (>5 cm), retroplacental location, and/or distortion of the uterine cavity are characteristics that have been associated with complications.
- Increased risk of miscarriage, placental abruption, fetal growth restriction, haemorrhage, and preterm labor and birth are associated complications.
- Every effort should be made to avoid surgical removal of fibroids in pregnancy because of the risk of significant morbidity.
- Caesarean birth is performed for standard obstetric indications (e.g., malpresentation, failure to progress), including obstruction of the birth canal by a fibroid.
- Myomectomy at the time of cesarean delivery is now performed in carefully in selected cases with informed consent under expert hands. Pedunculated sub serosal fibroids can also be safely removed at the time of cesarean delivery.
- Although most of the uterine fibroids are asymptomatic during pregnancy, serious complications can occur. Hence,

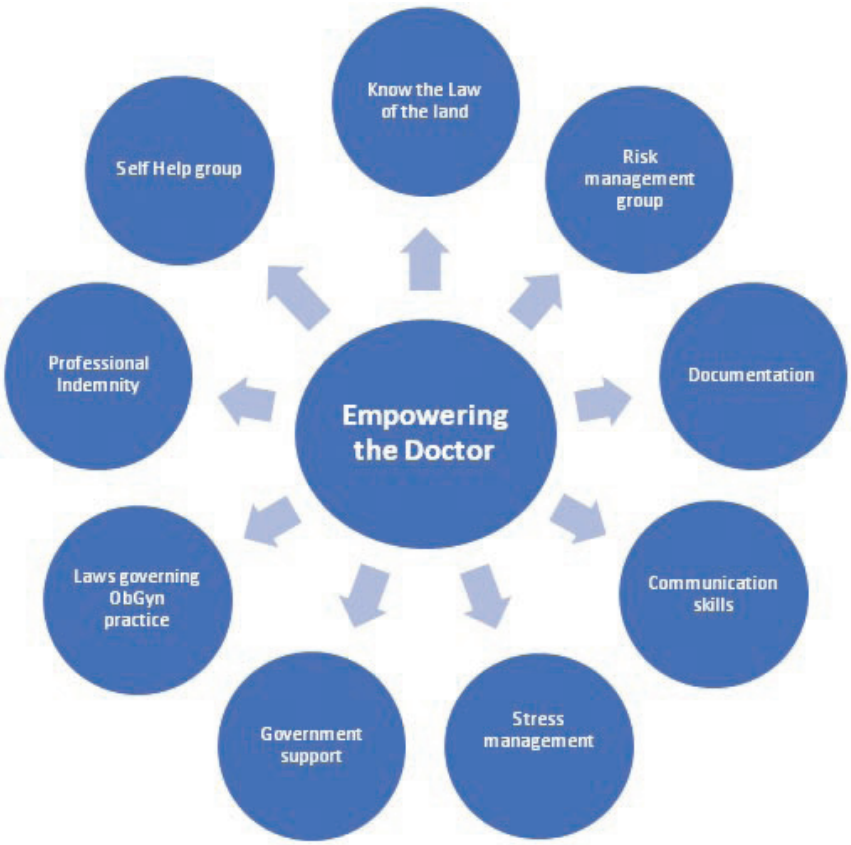
management of fibroid in pregnancy needs to be individualized.

References

1. Sparic R, Mirkovic L, Malvasi A, Tinelli A. Epidemiology of uterine myomas: a review. Int J FertilSteril 2016;9:424e35.
2. Vitale SG, Tropea A, Rossetti D, Carnelli M, Cianci A. Management of uterine leiomyomas in pregnancy: Review of literature. Updates Surg. 2013;65(3):179- 82.
3. De Vivo A, Mancuso A, Giacobbe A, et al. Uterine myomas during pregnancy: A longitudinal sonographic study. Ultrasound Obstet Gynecol. 2011;37(3):361-5.
4. Shikawa H, Ishi K, Ann Serna V, Kakazu R, Bulun SE, Kurita T. Progesterone is essential for maintenance and growth of uterine leiomyoma. Endocrinology. 2010;151(6):2433-42.
5. Hammoud AO, Asaad R, Berman J, Treadwell MC, Blackwell S, Diamond MP. Volume change of uterine myomas during pregnancy: Do myomas really grow? J Minim Invasive Gynecol. 2006;13(5):386-90.
6. Horiuchi A, Nikaido T, Yoshizawa T, et al. HCG promotes proliferation of uterine leiomyomal cells more strongly than that of myometrial smooth muscle cells in vitro. Mol Hum Reprod. 2000;6(6):523-8.
7. Sparić R. Uterine myomas in pregnancy, childbirth and puerperium. SrpArhCelokLek. 2014;142(1- 2):118-24.
8. Klatsky PC, Tran ND, Caughey AB, Fujimoto VY. Fibroids and reproductive outcomes: a systematic literature review from conception to delivery. Am J Obstet Gynecol. 2008;198(4):357-66.
9. Zaima A, Ash A. Fibroid in pregnancy: Characteristics, complications, and management. Postgrad Med J. 2011;87(1034):819-28.
10. Coronado GD, Marshall LM, Schwartz SM. Complications in pregnancy, labor, and delivery with uterine leiomyomas: a population-based study. ObstetGynecol 2000; 95:764.
11. External Cephalic Version and Reducing the Incidence of Term Breech Presentation: Green-top Guideline No. 20a. BJOG. 2017 Jun;124(7):e178-e192. doi: 10.1111/1471-0528.14466. Epub 2017 Mar 16
12. Eur J Obstet Gynecol Reprod Biol. 2020 Nov;254:15-24. Myomectomy during pregnancy: an obstetric overview. Loverro G, Damiani GR, Malvasi A, Loverro M, Schonauer LM, Muzzupapa G, Dinaro E.
13. Spyropoulou K, Kosmas I, Tsakiridis I, Mamopoulos A, Kalogiannidis I, Athanasiadis A, Daponte A, DagklisT. Myomectomy during pregnancy: A systematic review. Minerva Obstet Gynecol. 2021 Oct;73(5):646-653
14. Kwon JY, Byun JH, Shin I, Hong S, Kim R, Park IY. Risk factors for intraoperative hemorrhage during cesarean myomectomy. Taiwan J Obstet Gynecol. 2021 Jan;60(1):41-44.
15. Lovina SM Machado, Gowri V, Al-Riyami N, Al-Khurasi L. Cesarean myomectomy feasibility and safety SQU MED J. May 2012;12(2):190-196
16. El-refaie, W., Hassan, M., Abdelhafez, M.S.Myomectomy during cesarean section: A retrospective cohort study Journal of Gynecology Obstetrics and Human Reproduction, Volume 49, Issue 10, December 2020
17. Vilos GA, Allaire C, Laberge PY, Leyland N; SPECIAL CONTRIBUTORS. The management of uterine leiomyomas. J Obstet Gynaecol Can. 2015 Feb;37(2):157-178. doi: 10.1016/S1701-2163(15)30338-8.
18. Laughlin SK, Hartmann KE, Baird DD. Postpartum factors and natural fibroid regression. Am J ObstetGynecol 2011; 204:496.e1.
19. Tan YL, Naidu A. Rare postpartum ruptured degenerated fibroid: a case report. J Obstet Gynaecol Res. 2014 May;40(5):1423-5. doi: 10.1111/jog.12334. Epub 2014 Apr 2

Safeguarding the Doctors

Both adverse outcomes during critical/complex clinical situations and public response to them is part of professional life. The recent IMA survey reports that over 80% doctors are stressed out in their profession and congenial environment to discharge our professional duty is of utmost importance. To address this issue, we need multipronged approach and this section of bulletin, starting from June would be covering the relevant information.



AOGD Risk Management Support [ARMS] Group

One of the ways to ensure the stress-free work environment and optimal patient care is mutual support among professional colleagues. We propose to form an advisory group of senior AOGD members that can be contacted if one of us is caught in a complex clinical dilemma / dealing with aggressive clients or is apprehensive about how to document or effectively troubleshoot a potential problem. This group will provide the timely advice and will be led by-

Convener- **Dr. Vijay Zutshi**- 9818319110

Co convener- **Dr. Aruna Nigam** - 9868656051

We invite suggestions from all members regarding functioning of this cell which will guide us forming the SOPs. Any member interested in being part of Advisory group may contact the convener.

Pl mail to aogdmamc2022@gmail.com

Events held in April 2022

S. N.	Date	Events
1	01.04.2022	AOGD Monthly Clinical Meeting at VMMC & Safdarjung Hospital
2	01.04.2022	GBM & taking over of AOGD, from Safdarjung Hospital
3	05.04.2022	Workshop on "Hands on Screening Program on Cervical and Breast cancer"under aegis of AOGD and Breast and Cervical cancer Awareness, Screening and Prevention Subcommittee, AOGD, at School of Nursing Science and Research, Sharda University, Greater Noida
4	16.04.2022	Webinar on "Transitions in adolescence" under aegis of AOGD and Rural health subcommittee with IAP.
5	17.04.2022	"MADAN : MTP Awareness Drive Across the Nation" by FOGSI MTP Comittee under Agis of AOGD
6	18.04.2022	PG forum on "Hypertensive disorders in pregnancy"
7	21.04.2022 22.04.2022	"Public forum" under aegis of Rural health subcommittee in association with Rotary club
8	23.04.2022	Webinar:"Towards elimination of cervical cancer, translating guidelines to practice- Part 2"
9	25.04.2022	"Induction of Labour- Optimizing Outcomes" under aegis of Safe Motherhood subcommittee

Forthcoming Events

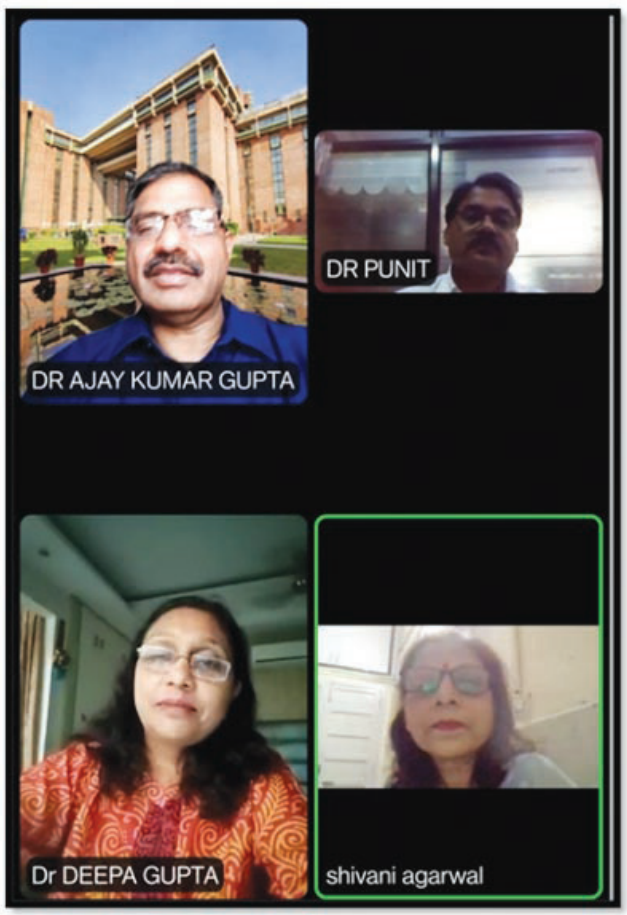
S. N.	Date	Events
1	05.05.2022	"Management of CNS anomalies" by Genetics and Fetal medicine subcommittee
2	13.05.2022	CME by Endometriosis subcommittee
3	16.05.2022	PG Forum on "Gestational Trophoblastic Disease"
4	19.05.2022	"Prevent, Promote, Protect adolescent health" by ESI hospital with Adolescent Subcommittee
5	21.05.2022	"Elimination of cervical cancer- part -3" by Oncology subcommittee
6	26.05.2022	CME by Endoscopy subcommittee
7	27.05.2022	AOGD monthly clinical meeting at B L Kapoor Hospital
8	28.05.2022	Activity of Safe motherhood committee with FOGSI HIV committee
9	31.05.2022	CME on "Ethics and communication' by Multidisciplinary subcommittee
10	11.06.2022	FOGSI Conference on OBGYN: Charting Difficult Territories at Le Meridien, New Delhi
11	12.11.2023- 13.11.2023	AOGD Annual Conference

Events held under aegis of AOGD in April 2022

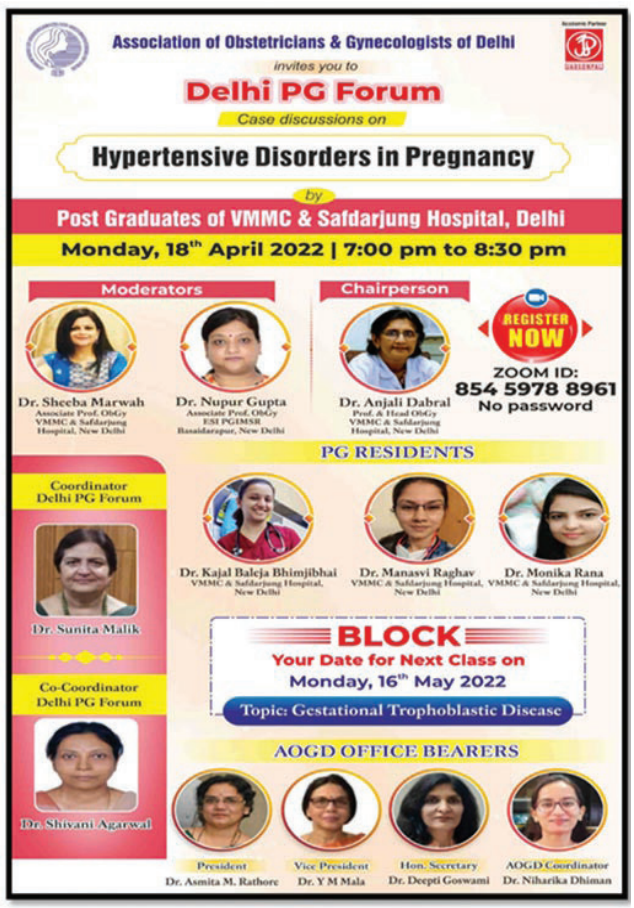
AOGD Monthly Clinical Meeting at VMMC & Safdarjung Hospital on 1st April 2022

GBM & taking over of AOGD, from Safdarjung Hospital on 1st April 2022

Workshop on "Hands on Screening Programme on Cervical and Breast cancer"
Breast and Cervical cancer Awareness, Screening and Prevention Subcommittee, AOGD
at School of Nursing Science and Research, Sharda University, Greater Noida

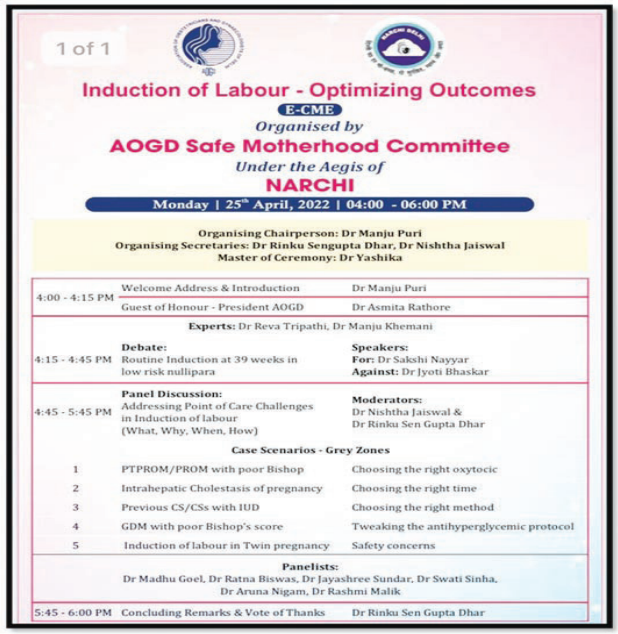


Webinar on "Transitions in adolescence"
Rural health subcommittee with IAP



PG Forum on "Hypertensive Disorders in Pregnancy"

"Public forum" under aegis of Rural health subcommittee in association with Rotary club



1 of 1

Induction of Labour - Optimizing Outcomes

E-CME

Organised by

AOGD Safe Motherhood Committee

Under the Aegis of

NARCHI

Monday | 25th April, 2022 | 04:00 - 06:00 PM

Organising Chairperson: Dr Manju Puri
Organising Secretaries: Dr Rinku Sengupta Dhar, Dr Nishtha Jaiswal
Master of Ceremony: Dr Yashika

4:00 - 4:15 PM	Welcome Address & Introduction	Dr Manju Puri
	Guest of Honour - President AOGD	Dr Asmita Rathore
	Experts: Dr Reva Tripathi, Dr Manju Khemani	
4:15 - 4:45 PM	**Debate:** Routine Induction at 39 weeks in low risk nullipara	**Speakers:** **For:** Dr Sakshi Nayyar **Against:** Dr Jyoti Bhaskar
4:45 - 5:45 PM	**Panel Discussion:** Addressing Point of Care Challenges in Induction of labour (What, Why, When, How)	**Moderators:** Dr Nishtha Jaiswal & Dr Rinku Sen Gupta Dhar
	Case Scenarios - Grey Zones	
	1 PTPROM/PROM with poor Bishop	Choosing the right oxytocic
	2 Intrahepatic Cholestasis of pregnancy	Choosing the right time
	3 Previous CS/CSs with IUD	Choosing the right method
	4 GDM with poor Bishop's score	Tweaking the antihyperglycemic protocol
	5 Induction of labour in Twin pregnancy	Safety concerns
	Panelists: Dr Madhu Goel, Dr Ratna Biswas, Dr Jayashree Sundar, Dr Swati Sinha, Dr Aruna Nigam, Dr Rashmi Malik	
5:45 - 6:00 PM	Concluding Remarks & Vote of Thanks	Dr Rinku Sen Gupta Dhar

"Induction of Labour- Optimizing Outcomes" under aegis of Safe Motherhood subcommittee

Webinar: "Towards elimination of cervical cancer, translating guidelines to practice- Part 2"

MADAN : MTP Awareness Drive Across the Nation

AOGD Monthly Clinical Meeting Held at LHMC & SSKH on 29th April 2022

Rare Ovarian Cancer Variant- Onerous Diagnosis & Management

Dr. Reena Yadav*, Dr. Kanika Chopra*, Dr. Shilpi Aggarwal, Dr. Nishtha Jaiswal***

*Department of Obstetrics and Gynaecology, **Dept of Pathology, Lady Hardinge Medical College, New Delhi

We present a rare case of a 48-year-old, P6L4, postmenopausal woman. She presented with complaints of PMB for 9 months, pain abdomen & constipation for 6 months. She had undergone laparotomy 3 months prior to presenting to us (outside), where the doctors were unable to do anything owing to dense adhesions as mentioned in the notes and the abdomen was closed. On per-abdominal examination a midline vertical scar was present. A 30x20 cm mass was felt corresponding to the size of 32 weeks gravid uterus. The mass was irregular, hard, fixed and tender on palpation. No free fluid was felt. On per-speculum examination, the cervix was pulled up, on per-vaginal examination cervix was pulled up and deviated to right side. A hard and fixed mass was felt through the left fornix. On per-rectal examination, the same mass was felt with parametria and rectal mucosa free. On investigations, her ovarian markers were within normal limits with normal liver, kidney function tests. Chest Xray was also normal. MRI abdomen and pelvis was suggestive of a large well circumscribed lobulated abdominopelvic mass lesion measuring approx. 10.2x12.7x14.2 cms with inferior extension in to left adnexa & displacing the uterus anteriorly and to the right. The mass showed heterogenous signal changes with multiple areas of cystic degeneration/necrosis. The lesion was abutting posterior wall of uterus displacing the bowel loops. There was another small, well defined lobulated lesion showing similar signal characteristics in the right adnexa approx. 3.1x2.2x2.1 cm. No significant lymphadenopathy was seen in the pelvic and the paraaortic region and no free fluid was present. Probable differential diagnosis of a large sub-serosal fibroid with possible sarcomatous transformation or malignant ovarian tumour was made and decision for exploratory laparotomy taken. Per-operative findings were of a large mass of approx. 30x 25 cm adhered to sigmoid colon and retroperitoneally. Dense adhesions of the mass with the large bowel loop and omentum were present. Uterus appeared bulky and densely adherent to the above mass and left TO mass of 6 x 6cm. No gross omental deposits seen. The procedure done was total abdominal hysterectomy with bilateral salpingo-opherectomy with omentectomy with abdominopelvic mass and sigmoid resection followed by re-anastomosis and diversion ileostomy with pelvic lymphadenectomy and para-aortic node sampling. Sample retrieved was sent for histopathology which was suggestive of bilateral ovaries showing high grade neuroendocrine carcinoma. Sections from the pelvic peritoneum showed areas of tumour deposits. Omentum, pelvic and para-aortic lymphnodes were free from the tumour. Immunohistochemistry analysis was strongly positive for Bcl 2, CD56, Neuron specific enolase (NSE), PR and P53. Final stage of ovarian tumor was labelled as stage 1V-B. Patient was then referred to higher centre for further management. There in consultation with medical oncologist, patient was started on tab Etoposide 50 mg once daily for 2 weeks on-off regimen thereafter. Review CECT scan of chest and abdomen 4 months post- surgery revealed left pleural effusion with nodular deposits. Multiple variable sized liver metastasis seen with the largest measuring 7.3X4.6cm. Enlarged lymph nodes were seen in peripancreatic/periportal, para-aortic, bilateral internal and external iliac regions with largest measuring 2.4X3cm. Heterogeneous solid lesions were also seen in the pelvis with cystic areas of size 9.8X4.5cm and 6.6X5.7cm. She succumbed to her illness 6 months after the primary surgery.

Discussion: Primary Large cell neuroendocrine cancer (LCNEC) is a rare primary malignant tumor of the ovary. It is an aggressive tumour with poor prognosis. On reviewing the literature, in most of the case reports the clinical presentation was similar to epithelial ovarian cancer. The diagnosis is difficult to be made by clinical, radiological or by any specific markers. Confirmatory diagnosis requires confirmation by immunohistochemistry (IHC) analysis and includes a positive chromogranin A, Neural cell adhesion molecule, CD56, synaptophysin or NSE. Limited data are available

regarding the treatment protocol for LCNEC. No NCCN guidelines specifically for LCNEN of ovary exists. Tumor debulking surgery is to be followed by chemotherapy. Various combinations have been tried in the cases reported so far such as paclitaxel-carboplatin, cisplatin-cyclophosphamide and etoposide-cisplatin with varying results. Case reports published showed age varying from as low as 27 years to as old as 75 years and overall survival varies from 45 days to 64 months. Treatment guidelines are still evolving. Some LCNEC have revealed favourable prognosis owing to its chemosensitivity. So, an attempt to recognize factors that can help improve prognostication of this aggressive cancer and device treatment guidelines should be made with the help of prospective studies.

Cervical Cancer Screening in HIV Seropositive Women: Is Pap Smear Enough?

Dr. Swati Agrawal*, Dr. Shalini Singh*, Dr. Anju Seth, Dr. Smita Singh*****
Department of Obstetrics & Gynaecology*, Department of Paediatrics ART centre of excellence** and Department of Pathology***
Lady Hardinge Medical College & Associated Hospitals, New Delhi

Background: The prevalence of pre-invasive lesions (PIL) of cervix in HIV seropositive women ranges from 8.7%-69%. Although Pap test is the recommended screening method, it has concerns owing to high false negative cytology in HIV infected women and high attrition rates.

Aim: To compare the role of routine Colposcopy with pap test at initial visit for screening of pre-invasive lesions of cervix in HIV seropositive women.

Methods: A cross sectional study of 120 HIV seropositive women aged between age 25 to 50 years was done, in which they were screened for PIL of cervix by Pap test and Colposcopy simultaneously. Colposcopy directed biopsy was taken if swede score was >/=5 and the results were compared with Pap report as well as the Histopathology findings.

Results: Out of the 120 women screened, abnormal colposcopy was found in 22 women (18.3%) and biopsy was taken in the same sitting in them. Out of the remaining 98 women, Pap test came out negative in all so they were told to have routine follow up. Abnormal Pap tests were found in 6out of 22 women who had abnormal colposcopy and 16 were reported normal. All 6 women with abnormal colposcopy as well as abnormal Pap test had pre-invasive or invasive lesion on biopsy report. Out of the 16 women negative by Pap test but positive by colposcopy, 6 had PIL of cervix. Thus, out of the 12 women found positive for pre-invasive/ invasive lesion of the cervix, 6 would have been missed if only Pap test were to be used as the screening modality. Statistical analysis of the data showed a kappa coefficient of 0.37 suggesting colposcopy to be a better tool that Pap test.

Conclusion: HIV seropositive women are a vulnerable population for development of cervical cancer and need effective screening. Colposcopy should be used for routine initial screening test in combination with Pap test in these high-risk women to improve the detection rate of PIL of cervix; as use of only Pap test as the sole screening modality may miss out on many affected women.

Bladder Diverticulum mimicking as Hematocolpos: A rare case

Dr. ManjuPuri*, Dr. DeepikaMeena*, Dr. Lalit Aggarwal, Dr. Rama Anand***, Dr. Soni***
*Department of Obstetrics and Gynaecology,
**Department of Surgery, ***Department of Radiology,
LHMC, New Delhi

A 24 years old lady presented with complaints of dyspareunia and primary amenorrhea. Radiology as well as hormonal profile were suggestive of MRKH (Mayer-Rokitansky-Kuster-Hauser) syndrome along with hematocolpos. On laparotomy, MRKH findings were confirmed along with a thick walled 7x 5cm cyst posterior to the bladder and anterior to band in between two rudimentary horns. Intraoperative cystoscopy done failed to demonstrate any connection between the cyst and the bladder. Cystectomy was done and clear fluid with multiple stones (39 stones) were found inside. A rent of around 5mm was seen in the posteroinferior bladder wall after retreograde bladder filing. Biochemical examination of fluid aspirate from cyst showed protein: <0.1 g%, creatinine: 55mg%. HPE finding shows keratinizing stratified squamous epithelial lining in cyst wall with thickened muscular wall. In view of the biochemical and histopathological findings a diagnosis of bladder diverticulum was made. Other differential diagnosis like skene gland cyst is ruled out due to its position at the urethral base and bladder epidermoid cyst is lined by non-keratinising squamous epithelium without any muscle layer. The finding of a congenital bladder diverticulum in females is a rare but a known clinical

entity. Urinary stones in female bladder diverticulum are also uncommon. Although 40% of MRKH cases have associated upper urinary tract anomalies, MRKH syndrome with bladder diverticulum is not reported till date in the literature.

A Rare case of recurrent UTI

Dr. Shweta*, Dr. Purnima Kiran Gautam*, Dr. Pikee Saxena*, Dr. Pawan**
Department of Obstetrics & Gynaecology* and Department of Surgery** Lady Hardinge Medical College & Associated Hospitals, New Delhi

A 46 years old female, P4L4A1 presented with complaints of recurrent UTI since past 1 year. There was a history of post- partum IUCD insertion 10 years back and after 1 year of insertion she did not feel thread vaginally. She got herself evaluated at a local facility where Xray abdomen was done and she was referred to LHMC for misplaced IUCD. TVS, 3D-USG and CECT pelvis were done which showed IUCD inside urinary bladder with 4.2cm x 3.3cm limbs. Mild granulation was seen around IUCD with no posterior bladder wall penetration. She was planned for cystoscopic removal of intravesical IUCD.

On cystoscopy, inflamed bladder mucosa was seen. IUCD was visualized in the bladder lumen with encrustations over the limbs. IUCD was removed with the grasper. Post- operative period was uneventful and patient was discharged on post-operative third day.

Calendar of Virtual Monthly Clinical Meetings 2022-23

27th May, 2022	Apollo Hospital
24th June, 2022	B L Kapoor Hospital
29th July, 2022	Army Hospital (Research & Referral)
26th August, 2022	All India Institute of Medical Sciences
30th September, 2022	Deen Dayal Upadhyay Hospital
28th October, 2022	PGIMSR & ESI Hospital
12th& 13th November, 2022	44th AOGD Annual conference
25th November, 2022	VMMC & Safdarjung Hospital
30th December, 2022	Sir Ganga Ram Hospital
27th January, 2023	ABVIMS & Dr. Ram Manohar Lohia Hospital
24th February, 2023	UCMS & Guru Teg Bahadur Hospital
31st March, 2023	MAMC & Lok Nayak Hospital
28th April, 2023	LHMC & Smt. Sucheta Kriplani Hospital
26th May, 2023	Sitaram Bhartia Hospital

AOGD Sub-Committee Chairpersons

Congratulations to the newly elected chairpersons of AOGD sub-committee for the period 2022-24.

Committee	Chairperson	Contact No	Email.id
Breast and Cervical Cancer Awareness, Screening & Prevention sub-committee	Dr. Mrinalini Mani	9811835888	drmrinal5@gmail.com
Infertility sub-committee	Dr. Manju Khemani	9810611598	dr.manjukhemani@gmail.com
Rural Health sub-committee	Dr. Shivani Agarwal	9868249464	dragarwal.shivani@gmail.com
Multidisciplinary sub-committee	Dr. Kiran Guleria	9811142329	kiranguleria@yahoo.co.in
Existing sub-committee chairpersons 2021-2023			
Committee	**Chairperson & Co- Chairperson**	**Contact No**	**Email.id**
Endometriosis sub-committee	Dr. Anjila Aneja	9810059519	anjilaaneja1966@gmail.com
QI Obst & Gynae Practice sub-committee	Dr. K Aparna Sharma, Chairperson	9711824415	kaparnsharma@gmail.com
	Dr. Jyoti Bhaskar, Co-Chairperson	9711191648	jytbhaskar@yahoo.com
Oncology sub-committee	Dr. Sunita Malik	9818914579	svmalik@yahoo.com
Urogynaecology sub-committee	Dr. Geeta Mediratta, Chairperson	9810126985	gmediratta@yahoo.com
Adolescent Health sub-committee	Dr. Anita Rajorhia, Chairperson	9711177891	anitarajorhia716@gmail.com
	Dr. Sujata Das, Co-Chairperson	9971946064	drdas_sujata2110@yahoo.co.in
Reproductive Endocrinology sub-committee	Dr. Surveen Ghumman, Chairperson	9810475476	surveen12@gmail.com
	Dr. Deepti Goswami, Co-Chairperason	9968604348	drdeeptigoswami@hotmail.com
Safe Motherhood sub-committee	Dr. Manju Puri	9313496933	drmanjupuri@gmail.com
Fetal Medicine & Genetics sub-committee	Dr. Seema Thakur, Chairperson	9818387430	Seematranjan@gmail.com
	Dr. Sangeeta Gupta, Co- Chairperson	9968604349	drsangeetamamc@gmail.com
Endoscopy sub-committee	Dr. Kanika Jain	9811022255	dr.kanika@gmail.com

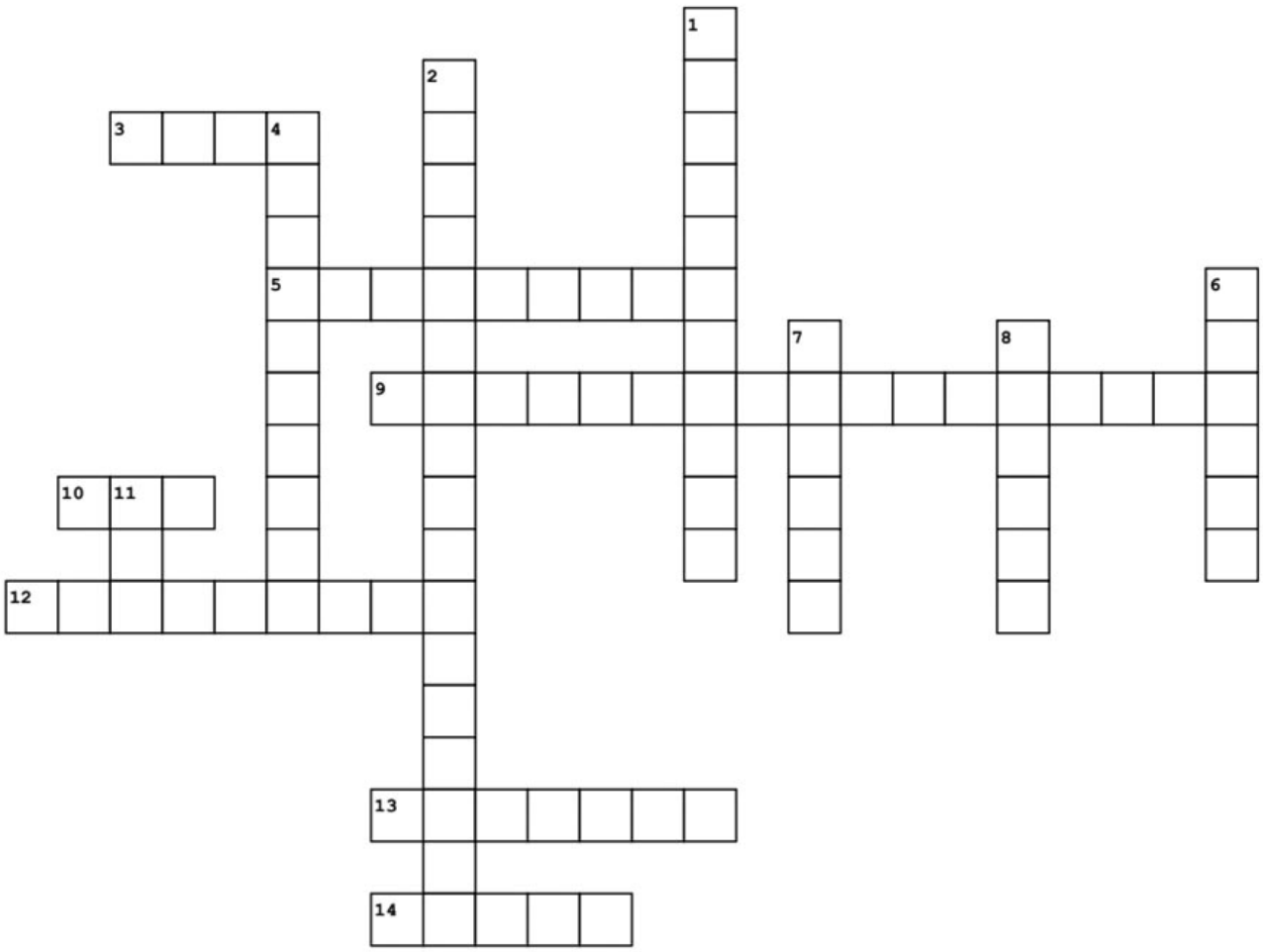
All interested AOGD members working in the field may contact the concerned chairperson to become members of respective sub-committees.

NOTE: Merging Subcommittees in the year 2023

- Infertility and Reproductive Endocrinology sub-committee – named as Infertility & Reproductive Endocrinology sub-committee
- Safe motherhood and multidisciplinary sub-committees – named as Safe Motherhood sub-committee
- Rural health sub-committee will be changed to Community health & Public Awareness sub-committee.

Cross Word Puzzle

Nalini Bala Pandey*, Sadhana Singh**
*Consultant & Chief Medical officer, **Senior Resident, Department of Obstetrics & Gynaecology. MAMC & Lok Nayak Hospital, New Delhi.



Across

3. Ulipristal acetate used in fibroid management is a
5. Technique used for performing myomectomy during cesarean section
9. Drug that reduces the size of fibroid
10. Most common symptom of fibroid
12. The most common pelvic tumor in females
13. Most favorable route of hysterectomy for patient of fibroid uterus in terms of postoperative recovery
14. Most common gene mutation in fibroid

Down

1. An intramyometrial injection which causes significant reduction in intraoperative blood loss
2. GnRH approved by FDA for managing fibroid
4. Management of choice of Uterine fibroid 7x8 cm in women of 26 years old
6. Broad ligament fibroid is related to
7. Stepw classification of submocosal fibroid was given by
8. Red degeneration in uterine fibroid most commonly seen in which trimester
11. Best imaging modality for measuring the myometrial extent of submucous leiomyomas

Mail the answers to aogdeditor22@gmail.com. The correct answers and names of the three winners will be announced in the next issue.

Association of Obstetricians & Gynaecologists of Delhi

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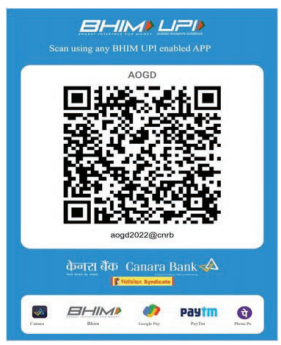
Cheque/Demand Draft should be drawn in favour of: **AOGD 2022**



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