AOGD BULLETIN

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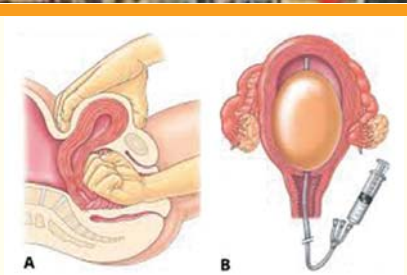
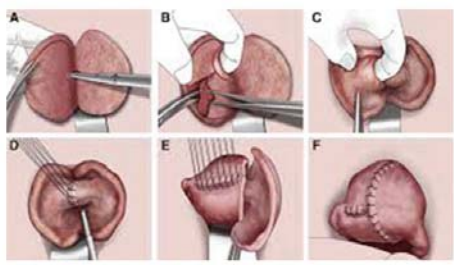
AOGD Theme 2018-19
Empowering Providers: Enhancing Women's Health

***Issue:* Current Update**
Obstetric Hemorrhage
Menstrual Disorders





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Contents

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President's Message

Dear Friends,

Greetings! **A Very Happy and Prosperous New Year**.

AOGD begins 2019 with a resolution to generate public awareness on important health issues and organize skill enhancing academic activities for its members. On the same, December chill did not deter us from joining hands with NARCHI to generate awareness on Thalassemia by participating in the walkathon on the morning of 2nd December 2018 at Connaught Place.

Continuing with the academic endeavors, AOGD organized a guest lecture on 21/12/18 by Dr Barry Berghmans from Pelvic Care Centre Maastricht Netherlands on "Prevention and nonsurgical management of pelvic floor dysfunction" at Lady Hardinge Medical College. The talk provided valuable insights on pelvic floor training and rehabilitation. This lecture was well attended and highly appreciated as evidenced by the interaction following it. A Clinical Meeting was held at Sir Gangaram Hospital on 27/12/18 where series of interesting cases, managed laparoscopically were presented.

AOGD started January 2019 with a successful "Walk For a Cause: Prevent Female Feticide & Save the Girl Child" in association with FOGSI at Lady Hardinge Medical College on 2nd January 2019. The event started with a skit on prevention of female feticide followed by Zumba dance with very enthusiastic participation by AOGD members, faculty members from other departments, MBBS students and culminated with a walk on Shaheed Bhagat Singh Marg adjacent to Connaught Place where slogans like "save the girl child – Stop female feticide, Beti Bachao – Beti Padhao, Pankh do Parvaz do- Nari ko Aakash do" filled the air. More than 250 people participated in the event.

This year we pledge to take AOGD to newer heights with our continued efforts on the academic front and for this we bring forth the January issue of AOGD Bulletin with latest scientific advances and rich academic content. The present issue focuses on two very important topics, "Obstetrical Hemorrhage" and "Menstrual Disorders".

Obstetrical hemorrhage is a leading cause of maternal mortality and morbidity worldwide. Delayed and improper care can cause mortality within minutes of massive obstetrical hemorrhage. Prenatal identification of at risk women, prompt assessment of blood loss and effective protocol based management is of utmost importance to save these lives. This issue discusses the current evidence based management of obstetric hemorrhage, addresses controversies and highlights newer advances in this field which is mandatory knowledge for every obstetrician.

Menstrual disorders are the most common cause of gynecological consultation. Menstrual dysfunction results in frequent absence from workplace and schools in adolescents and can have an impact on quality of life and may also be associated with uterine pathology. It is important to diagnose and manage them appropriately.

Hope you will benefit from this current issue.

Dr Abha Singh
President AOGD (2018-19)

Secretary's Message

Greetings from the AOGD Secretariat, LHMC

It is great to interact with all of you in a very pleasant and a smiling new year. We hope lot of health and happiness and joy in the New Year for all AOGD members. It was a happening last year for AOGD with lot of activities, CME's, a great conference and a series of public awareness programmes.

New Year started with a Grand National walk for the girl child piloted by Public awareness committee FOGSI and FOGSI President Dr Jaydeep Malhotra. At AOGD with enthusiastic participation of our members, Nursing school with their students, our senior faculty from other departments, residents and undergraduates we had a successful walkathon on 2nd January, 2019 starting from LHMC. Zumba, street play and talks made the event happening and enjoyable.

Guest lecture by Dr Bary Berghmans on addressing nonsurgical concerns for pelvic floor dysfunction was enlightening and well appreciated.

The editorial team brings forth a very important issue addressing Obstetric haemorrhage and Menstrual disorders. Rising adherent placentas in day to day practice is becoming a frequent event. The latest update on the management of these will keep you in tune with the recent evidence based guidelines.

The third postgraduate infertility update by the Infertility subcommittee of AOGD will be shortly announced.

Wishing you all a very happy festive season with best wishes for Republic day, Lohri, Sakranti and Pongal.

Dr Kiran Aggarwal
Secretary AOGD (2018-19)

Monthly Clinical Meeting

Monthly Clinical Meet will be held at Ram Manohar Lohia Hospital, New Delhi on **Friday, 25th January, 2019 from 04:00pm to 05:00pm**.

Editorial Team's Message

Dr Ratna Biswas
Editor

Dr Pikee Saxena

Dr Sharda Patra

Dr Swati Agrawal

Co-Editors

Hello ! Friends,

"Wishing all our readers a very happy and magnificent 2019"

At this august start to the new year we are ready with a knowledge packed January Bulletin with the themes "Obstetric hemorrhage" and "Menstrual Disorders"

Obstetric hemorrhage is a serious complication because there is a very limited time frame to act and preserve life which can be lost within minutes after onset of massive obstetric hemorrhage. Preparedness to deal with this potentially life threatening but preventable complication is the concept behind our first article that is "Best Practices: Maternal Safety Bundle for Obstetric hemorrhage". All labor wards should be well eqipped and well versed with the drills to manage obstetric hemorrhage.

Recent Advances in management of PPH has highlighted the newer investigations,drugs, equipments, paraphernelia and procedures to tackle this complication. A very focussed prompt and skillfull management protocol is essential to reduce morbidity and mortality. No woman should die of obstetric hemorrage because if they do then we have lost our fight against a cause we could have prevented.

Controversy on Management of Morbidly Adherent Placenta: Hysterectomy Vs Conservative continues but the balance has tipped towards hysterectomy as a better outcome measure as per recent reviews.

Case approach section deals with PPH due to Coagulopathy in Abruption and Hepatitis. Replacement of FFP, blood, platelets and coaugulation factors in appropriate quantity can halt the ongoing blood loss. Surgical procedures are hazardous and should be carried out under the cover of blood and blood products. It is important to replace them both pre and post procedure for sufficient duration of time so that the risk of ongoing bleeding is minimized.

The motivational article on "The Relation Cure" is about nurturing relationships which is the essence of life

The gynecology section on Menstrual Disorders begins with the "Standard of Care in Perimenopausal AUB". This is a common cause of gynecological consultation which can be physiological due to anovulatory cycles or pathological in the form of premalignant or malignant lesions of uterus. A transvaginal scan and an endometrial histopathology can reliably define the diagnosis and initiate a management plan. Complex endometrial hyperplasia and endometrial carcinoma should be managed surgically.

"Diagnosis & Management of Adenomyosis" has shown a remarkable progress. Diagnosis is being made more often now and newer frontiers have opened up in the surgical management which has added a list of procedures for conservative surgical management with fertility preservation.

Case Approach to Primary Amenorrhea is a complex approach to a simple symptom. Genetic, congenital and acquired causes all can contribute to primary amenorrhea. Management is tailored to the cause.

The maze of knowledge-crossword, pictorial quiz, journal scan and proceedings of clinical meetings are all very interesting and a must read section.

Once again we are immensely indebted to our authors for their whole hearted contribution towards their scripts.

Hope you all enjoy reading this edition.

Editorial Team

BEST PRACTICES

Maternal Safety Bundle for Obstetric Hemorrhage


Dr Indu Chawla

Indu Chawla[1], Pooja Gupta[2]

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Obstetric hemorrhage is the most common serious complication of childbirth and is the most preventable cause of maternal mortality and morbidity. Reviews have found that 93% of all hemorrhage related deaths were considered potentially preventable.[1] Common preventable errors include under recognition of the blood loss, lack of appropriate attention to clinical signs of hemorrhage and associated hypovolemia, failure to act decisively with lifesaving interventions, and failure to restore blood volume in a timely manner.[2] Estimated blood loss more than 500 mL after vaginal birth and more than 1,000 mL after cesarean birth were widely used to define postpartum hemorrhage, but these estimates are hindered by the near-universal tendency to underestimate blood loss at birth. These volumes are actually close to the average blood loss for vaginal and cesarean births. A revised definition of early postpartum hemorrhage as "cumulative blood loss of 1,000 mL or blood loss accompanied by signs and symptoms of hypovolemia within 24 hours following the birth process," with a note that "cumulative blood loss of 500–999 mL alone should trigger increased supervision and potential interventions as clinically indicated.[3] Therefore, careful and cumulative assessment of blood loss is a crucial component.

Comprehensive hemorrhage protocols have been shown to improve patient safety and reduce the use of blood products.[4] A workgroup of the Partnership for Maternal Safety in USA, within the Council on Patient Safety in Women's Health Care and representing all major women's health care professional organizations, has developed an obstetric hemorrhage safety bundle. The goal of the partnership is the adoption of the safety bundle by every birthing facility in the United States.[5]

A patient safety bundle is a set of straightforward, evidence-based recommendations for practice and care processes known to improve outcomes.

Such a bundle is not a new guideline, but rather represents a selection of existing guidelines and recommendations in a form that aids implementation and consistency of practice.[6] The consensus bundle on obstetric hemorrhage is organized into four action domains: **Readiness, Recognition and Prevention, Response, and Reporting and Systems Learning.** There are 13 key elements within these four action domains.

Obstetric Hemorrhage Safety Bundle From the National Partnership for Maternal Safety, Council on Patient Safety in Women's Health Care[6]

Readiness (Every Unit)

1. Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compression stitches
2. Immediate access to hemorrhage medications (kit or equivalent)
3. Establish a response team—who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
4. Establish massive and emergency-release transfusion protocols (type-O negative or un cross matched)
5. Unit education on protocols, unit-based drills (with post drill debriefs)

Recognition and Prevention (Every Patient)

6. Assessment of hemorrhage risk (prenatal, on admission,)
7. Measurement of cumulative blood loss (formal, as quantitative)
8. Active management of the 3rd stage of labor

Response (Every Hemorrhage)

9. Unit-standard, stage-based obstetric hemorrhage plan /with checklists
10. Support program for patients, families, and staff

Reporting and Systems Learning (Every Unit)

11. Establish a culture of huddles for high-risk patients and post-event briefs
12. Multidisciplinary review of serious hemorrhages for systems issues
13. Monitor outcomes and process metrics in perinatal quality improvement

Readiness (Every Unit)

The Readiness domain includes five areas of focus to be addressed by every facility to prevent delays and prepare for the optimal management of obstetric hemorrhage cases. Readiness aims at improving interdepartmental co-ordination.

HEMORRHAGE CART

It should comprise of a sterile tray with rapid access to instruments so as to deal with emergency hemorrhage

situations. It is also valuable for the cart to contain cognitive aids for infrequently performed technically procedures, such as placement of uterine tamponade balloons and uterine compression sutures. A set of recommended instruments and supplies include-[7]

Vaginal

Vaginal retractors, long weighted speculum

Long instruments –needle holder, scissors, Kelly Clamps, sponge holders

Intrauterine balloon

Banjo curette

Bright task light

Procedural Instructions

Cesarean/Laparotomy

Hysterectomy tray

No.1 chromic or plain catgut suture

Reloadable straight needle for B-Lynch sutures

Intrauterine balloon

Procedural instructions namely balloon, B-Lynch, arterial ligations.

Hemorrhage Medication Kit

Oxytocin (Pitocin)	10 units 2 vials
Oxytocin (Pitocin)	10-40 units per 500-1000mL solution 2 pre-mixed bags
15-methyl PGF2α	250 micrograms/milliliters 1 ampule
Misoprostol	200 microgram tablets 5 tab
Methyl ergonovine (Methergine)	0.2 milligrams/milliliters 1 ampule

Establish A Response Team

It is critical that all institutions determine who will be part of the core response team for obstetric hemorrhage. In addition to the primary maternity care provider and nurse, the team will likely engage clinicians from anesthesiology, transfusion service (blood bank), pharmacy, advanced gynecologic surgery, critical care medicine, the main operating room, interventional radiology, and additional nursing resources. A critical part of the plan will be determining a simple and reliable way to notify required team members using readily available phone or pager numbers or a “rapid response” or “code” system.

Establish Massive and Emergency Release Transfusion Protocols

Every institution should ensure the functioning of blood bank facilities. A massive transfusion protocol facilitates rapid dispensing of RBCs, plasma, and platelets in a pre-defined ratio intended to preclude development of a dilutional coagulopathy that can result if a significant percentage of the patient’s blood volume is replaced with large quantities of crystalloid, colloid or RBCs. In the setting of continued active hemorrhage, and after the first several units, there is retrospective and some prospective evidence supporting an RBC-to-plasma ratio between 1:1 and 2:1 for the total transfused units.

Fibrinogen is consumed rapidly during obstetric hemorrhage, so it is important to monitor fibrinogen levels and replace with cryoprecipitate as needed.

MASSIVE TRANSFUSION PROTOCOL	ONGOING HEAVY BLEEDING	ANTICIPATING FURTHER BLOOD LOSS
Draw crossmatch and send requisition Send lab investigations-CBC, PT/APTT, Fibrinigen, ABG	OBSTETRICS EMERGENCY RELEASE 2-4 Units of O Negetive PRBCs	MASSIVE TRANSFUSION PACK (6:4:1) 6U PRBCs 4U FFP 1 U Platlet apheresis

The management of the patient who is being massively transfused requires careful and ongoing consideration of a number of complex physiological relationships. Hence, as volume is replaced, attention must be paid to coagulation parameters, platelet count, and metabolic status. The coagulation system should be frequently monitored with measurements of the PT, aPTT, fibrinogen concentration, and platelet count or a viscoelastic measure (also called point of care testing), after each five units of blood replaced. If the PT and aPTT exceed 1.5 times the control value, the patient should be transfused with at least two units of fresh frozen plasma. If the platelet count falls below 50,000, six units of random donor platelets, or one unit of apheresis platelets, should be given. Rapid transfusion of multiple units of chilled blood may reduce the core temperature abruptly and can lead to cardiac arrhythmias. Acid-base balance and the plasma ionized calcium and potassium levels should be periodically monitored.

Hemorrhage Drills

A drill refers to clear and logical set of steps involved in the patient management. This aims to understand how to develop and implement obstetrical emergency drills. All team members are familiarized with entire safety bundle and new management plan. Participating members are assigned tasks and responsibilities necessary to run drills. Post- drill debriefings provide an invaluable opportunity to learn from the experience, specifically to reinforce areas of the drill that went well, discuss areas in need of improvement, share lessons learned, and highlight systems issues to allow for concrete planning for potential solutions.

Drills may be combined with practicing infrequently used hemorrhage technical skills (placing a tamponade balloon or a compression suture) using simple aids.[5]

Recognition & Prevention (Every Patient)

The Recognition and Prevention domain addresses three areas that should be incorporated into the care of every patient.

Assessment of Hemorrhage Risk

Identification of risk factors for postpartum hemorrhage can help to improve readiness, allow increased surveillance and early recognition, increase the use of preventive measures, and prepare the team to initiate an early, aggressive response to bleeding. Multiple risk-assessment tools are available and are useful in planning, but it should be understood that they are imperfect. Typically these tools identify 25% of women to be at higher risk who will then develop 60% of the severe hemorrhages (requiring transfusion). Therefore, because approximately 40% of postpartum hemorrhages occur in low-risk women, every birth has to be considered to have risk, reinforcing the need for universal vigilance. Risk assessment should be considered at multiple time points during patient care, including antepartum, on admission to labor and delivery, later in labor

RISK ASSESSMENT: PRENATAL [7]

Suspected previa /accreta /increta /percreta

Pre-pregnancy BMI >50

Clinically significant bleeding disorder

Other significant medical/surgical risk

RISK ASSESSMENT: ADMISSION

Medium Risk

Prior cesarean, uterine surgery, or multiple laparotomies
Multiple gestation
>4 prior births
Prior obstetric hemorrhage
Large myoma
EFW>4000g
Obesity (BMI >40)
Hematocrit <30% & other risk

High Risk

Placenta previa/low lying
Suspected accreta/percreta
Platelet count <70,000
Active bleeding
Known coagulopathy
2 or more medium risk factors

RISK ASSESSMENT: INTRAPARTUM

Medium Risk

Chorioamnionitis
Prolonged oxytocin >24 hours
Prolonged 2nd stage
Magnesium sulfate

High Risk

New active bleeding
2 or more medium risk factors
(admission &/or intrapartum)

Measurement of Cumulative Blood Loss

Imprecise estimation of actual blood loss during birth and the postpartum period is a leading cause of delayed response that can result in morbidity or worse. Visual estimation of blood loss, sometimes called "a glance and a guess," is common practice in maternity care, but can result in underestimation of blood loss by 33-50%, particularly when large volumes are lost. Direct measurement of blood loss can be accomplished by two complementary approaches. The easiest to initiate is to collect blood in calibrated, under-buttocks drapes for vaginal birth or in calibrated canisters for cesarean birth. The second approach is to weigh blood-soaked items and clots and the weight of dry pads is subtracted from the total weight to obtain an estimate of blood loss. Each maternity unit should strive for the most accurate blood-loss assessment for every mother. In addition, measurement of cumulative blood loss (analogous to measurement of urinary output) is important for escalating the hemorrhage management plan and should be considered at set points during the birthing process and more frequently if bleeding is brisk.

Active Management of Third Stage of Labor

Active management of the third stage of labor has been demonstrated to be the single most important approach to preventing postpartum hemorrhage. Of the three classic components—oxytocin, uterine massage, and cord traction—recent studies have indicated that oxytocin is the key component. Prophylactic usage of oxytocin, 10 units by intravenous infusion (not intravenous bolus) or intramuscular injection, remains the most effective medication with the fewest side effects compared with ergot alkaloids (nausea and vomiting) and misoprostol (hyperpyrexia). Postponing oxytocin after delayed cord clamping does not increase the risk of hemorrhage. The World Health Organization, the College, the American Academy of Family Physicians, and AWHONN recommend oxytocin administration after all births.

Response (Every Hemorrhage)

The Response domain describes two key interventions that should be utilized in every hemorrhage.

Obstetric Hemorrhage Emergency Management Plan

Because obstetric hemorrhage represents a diverse group of diagnoses, a critical initial step is to determine the etiology. Uterine atony accounts for more than 70% of cases, but a careful examination (with good lighting and exposure) is important for identifying vaginal or cervical lacerations or a retained placenta. Stage-based management plans have been found to facilitate an organized, stepwise response to blood loss and maternal warning signs.[8,9] They ensure that resources are not wasted while each patient receives optimal therapy. Each institution needs to adjust the plan to meet its individual capabilities.

CHECKLIST	DIAGNOSIS	INTERVENTION	ROLE OF BLOOD BANK
STAGE 0 Activate hemorrhage protocol	Asses risk factors for hemorrhage. Estimate blood loss	Active management of third stage	High risk-send type & cross match Low risk-Type & screen
STAGE 1 Advance through medications and procedures- finding cause & treatment/ visualization	• Estimated Blood loss (EBL) >500 mL vaginal >1000 mL cesarean • Vitals/Lab values-NORMAL	• 16G/18G IV access • Increase IV fluid • Insert indwelling urinary catheter • Fundal massage • Increase oxytocin • Consider additional uterotonics	Type & cross match 2 units PRBCs
STAGE 2 Mobilizing help and Blood Bank support- Keeping check of volume and blood products.	Continued bleeding with EBL < 1500mL,or >2 uterotonics Vitals/Lab values-NORMAL	• Second IV (16-18G) line • Draw labs tests (CBC, PT/ APTT, fibrinogen) • *Vaginal Birth:* Repair tears, rule out retained placenta • Place intrauterine balloon • Selective Embolization • *Cesarean*- Inspect broad ligament, • B-Lynch Suture • Place intrauterine balloon • Uterine curettage • Placental bed suture • Uterine artery ligation • Uteroovarian ligation • Repair uterine rupture • Hysterectomy	• Consider 2Unit PRBC transfusion as per clinical signs – not wait for lab values • Use blood warmer • Consider thawing 2 FFP, if transfusing > 2Unit PRBCs • Check availability of additional RBCs and Coagulation products
STAGE 3 Activate massive transfusion protocol & Practice surgical Approach	• Bleeding with EBL over1500ml, OR • >2 units PRBCs given • Vitals/Lab values-ABNORMAL • Suspicion of DIC	Mobilize team - Gynecologist - Anesthetist - Adult Intensivist • Repeat lab values • Central line insertion • Family support • Surgical management • Supportive compression stockings	• Transfuse Aggressively-Massive Hemorrhage Pack (6:4:1). ✓ If not improving with 8-10 units PRBCs and full coagulation factor replacement: consider factor VIIa

Support Program for Patients, Families and Staff

Obstetric hemorrhage can occur rapidly, and the excitement and joy of childbirth shifts abruptly when the maternity team is required to focus on management of the bleeding. Women and their families need timely information, reassurance, and opportunities to discuss the incident with the maternity care provider.

Reporting and Systems Learning (Every Unit)

Establish A Culture of Huddles and Debriefs

Briefs, huddles, and debriefs need to be routine. Briefs are planning meetings that are used to form the team, designate roles and responsibilities, establish goals, and engage the team in short-term and long-term planning. Huddles are brief ad hoc team meetings designed to regain situational awareness, discuss critical issues and emerging events, anticipate outcomes and contingencies, assign resources, and express concerns. Debriefs are short, informal feedback sessions that occur after events and are designed to identify opportunities to improve teamwork, skills, and outcomes.[6]

Multidisciplinary Review of Serious Hemorrhages

These are formal meetings including staff involved in the incident, unit and facility leadership, and risk-management personnel. The purpose of these reviews is to identify systems issues or breakdowns that influenced the outcome of the event. Reviews should be sanctioned by the facility, protected from discovery in legal proceedings, and include a thorough record review, event timeline, and focused root-cause analysis.

Monitor Outcomes and Process Metrics

Monitoring process and outcome measures is important for the successful introduction of quality- improvement projects. Project success is generally measured by improved outcomes. The overall goal is to reduce the

number of obstetric hemorrhages that escalate into major blood loss resulting in severe maternal morbidity or mortality.[6]

Conclusion

Safety bundles are set of recommendations to reduce the maternal morbidity and mortality. Collaboration and coordination among departments helps to identify, anticipate and manage obstetric hemorrhage efficiently. Standard checklists in the bundle simplify the management and improve patient outcome.

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Calendar of Monthly Clinical Meetings 2018-19

Months	Name of the Institute
January, 2019	Dr RML Hospital
February, 2019	UCMS & GTB Hospital
March, 2019	LHMC
April, 2019	Apollo Hospital

RECENT ADVANCES

Management of Postpartum Hemorrhage

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Dr Shilpi Nain

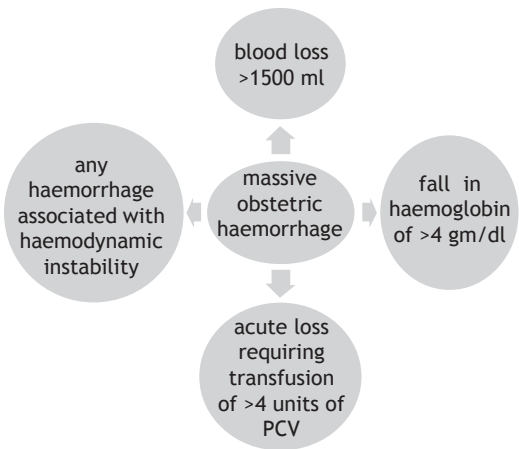
Introduction

WHO estimates that of the 5,29,000 maternal death occurring every year, 25.7% of death takes place in India and two third of these maternal death occur after delivery, PPH being the most commonly reported complication. Patients with PPH require aggressive measures guided by a well-defined multidisciplinary approach to prevent morbidity and mortality.

Definition

PRIMARY PPH: within 24 hours of delivery, > 500 ml after vaginal delivery; > 1000 ml following a caesarean section.

SECONDARY PPH: 24 hours to 6 weeks post delivery



CAUSES

- Tone – uterine atony due to polyhydramnios, multiple gestation,Myoma, medications
- Tissue- retained / adherent placenta
- Trauma - cervical or genital tract trauma during delivery
- Thombosis – coagulation disorder, DIC, ITP, HELLP

RISK FACTORS

- Prolonged labour
- Multiple pregnancy
- Polyhydramnios
- Large baby
- Obesity
- Previous history of uterine atony
- Coagulopathy

Prevention

Active management of third stage of labour is a feasible, low cost measure to prevent 60-70% of atonic PPH

- Prophylactic uterotonic administration during the third stage of labor with oxytocin (IM 10 IU) being the preferred drug.
- Ergometrine or Misoprostol (600 mcg) can be used if oxytocin is not available.
- Oxytocin in a Uniject system, prefilled, single-dose injection with a fixed needle can be used in low resource settings in the absence of skilled workers.
- A powdered, inhalable, heat-stable oxytocin is also being developed for an aerosol delivery system.
- Carbetocin, a long acting synthetic analogue of oxytocin is equally efficacious with decreased need for subsequent uterotonic administration, less blood loss, fewer adverse effects and greater cost effectiveness. It does not require refrigeration and retains its efficacy for at least 3 years stored at 30° C and 75% relative humidity. It has been approved in 23 countries for prevention of uterine atony and excessive bleeding following caesarean delivery in spinal or epidural anesthesia[1].

Diagnosis

The diagnosis of PPH is usually established by observing the amount of bleeding and the patient's clinical status. Presence of amniotic fluid makes accurate estimation a challenging task.

❖ Estimation of Bleeding

- Visual estimation of blood loss is most common but many times inaccurate, with 16-41% underestimation
- A calibrated, plastic, closed-ended blood collection drape under buttock improves valid estimation. It has markings for warning (350ml) and action (500 ml). It may contain a mesh to separate the membrane or placental bits from blood. Figure 1

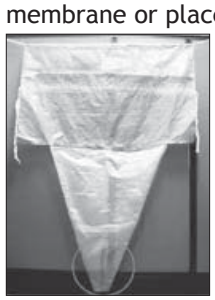


Figure 1

- Blood loss estimation by weight of soiled dressings:

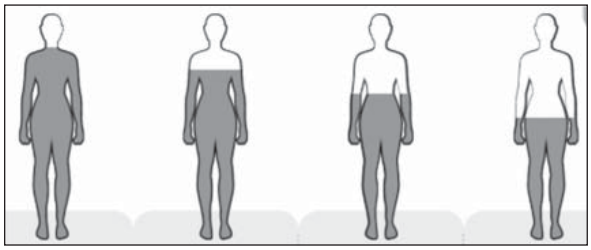
  Weight of blood in a dressing in grams = weight of dressing after removal – weight before application → weight of blood in dressings in gm / 1.06 = Volume of lost blood in ml (1.06 is the density of whole blood)

  Assuming that weight is due only to blood and not environmental water or debris
- Written and pictorial guide to aid visual estimation in labour wards may be helpful.

- The gold standard for blood loss estimation is photospectrometry or colorimetric measurement of alkaline hematin.

❖ Clinical condition

- Clinical signs are manifested late and hypovolemia doesn't manifest until 35- 40% of circulating blood volume is lost.



500-1000 ml	1000-1500 ml	1500-2000 ml	>3500 ml
15% blood loss	20-25% blood loss	30-35% blood loss	40-45% blood loss
No Sign/ Symptoms	• Reduced pulse pressure • Tachycardia • Tachypnoea • Hypotension	• Cold extremities • Hypotension • Acidosis • Oliguria • Cyanosis	• Death

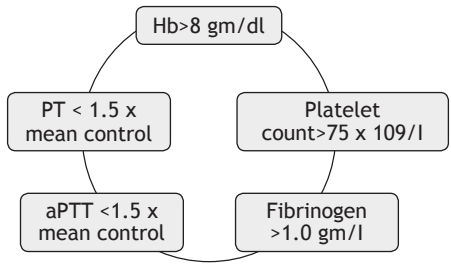
- Obstetric Shock Index (HR / SBP) (normal = 0.5 - 0.7) or Modified Shock Index (HR / MAP) (normal < 1.3) has been found to have clinical utility for early diagnosis of haemorrhage.[2]

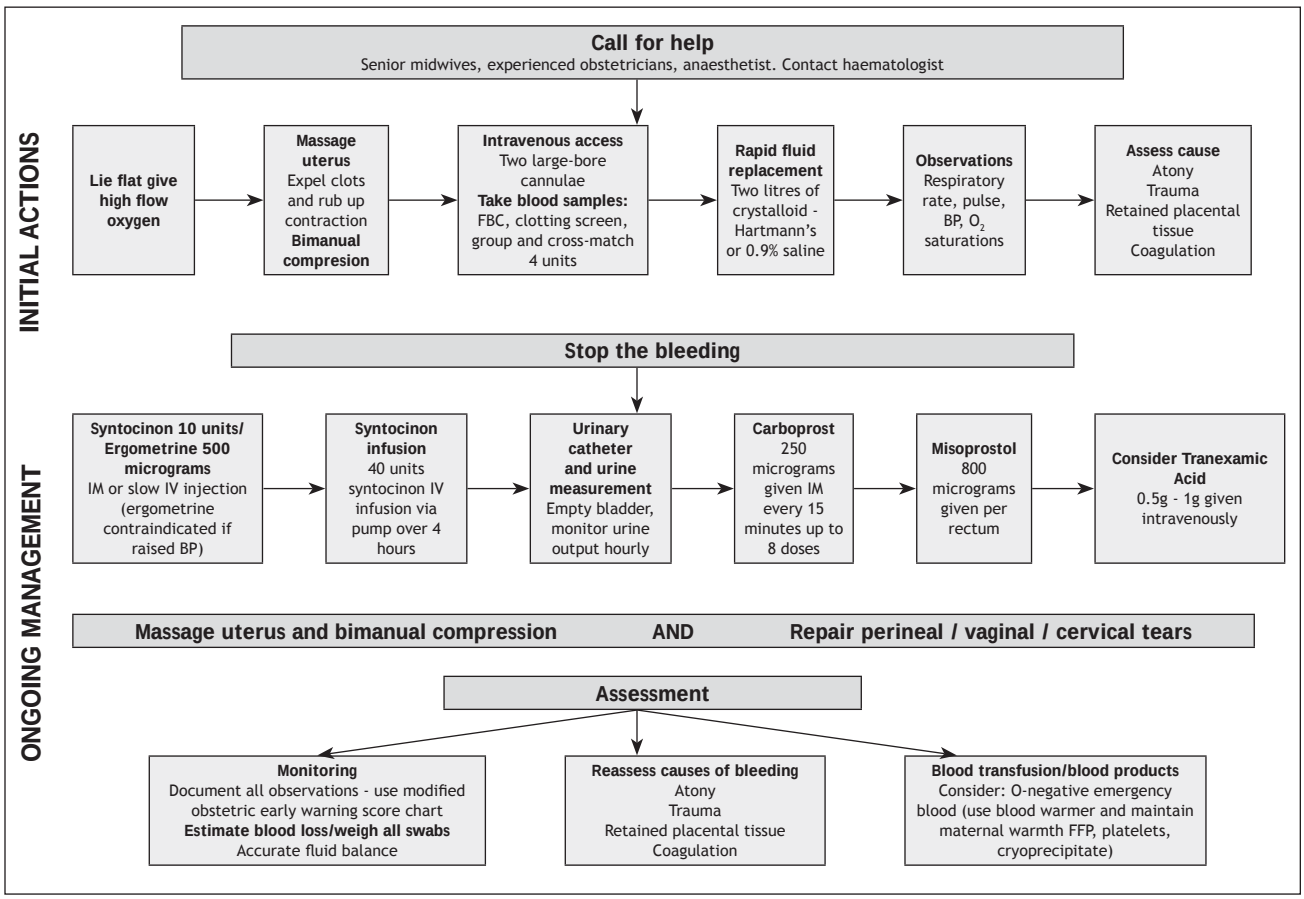
Protocol for The Management of PPH

Minor PPH prompts basic measures of monitoring and 'readiness for resuscitation', whereas Major PPH prompts a full protocol of measures to resuscitate, monitor and arrest the bleeding. Management involves four components, all of which must be taken simultaneously - **Communication, Resuscitation, Investigation and Arresting the bleeding.**

Goal of Management

- **Readiness** - Haemorrhage cart (instruction cards, balloons, stitches, medications, Response team, Massive transfusion protocols, Regular drills and debriefing.
- **Recognition and Prevention** - Assessment of risk, Measurement of blood loss, AMTSL
- **Response** - Monitor outcomes, Standardised management plan and checklists, post-event debriefing, Multidisciplinary review.





Communication

- The magnitude and underlying cause of the bleeding to some degree dictate which specialized personnel are called, but a minimum of 1 obstetrician and 1 anaesthetist is necessary.
- Notifying blood transfusion services.
- Call porters for delivery of specimens/blood.
- Designate an experienced person to document critical information about events, fluids, drugs, vital parameters and times.
- Ensure the availability of an operating room.

Resuscitation

- Transfuse **blood** as soon as possible.
- Until blood is available, infuse up to 2 litres of warmed **crystalloids** (preferably) and/or colloid (1–2 litres) as rapidly as required.
- If crossmatched blood is still unavailable, give uncrossmatched group-specific blood or give 'O negative' blood.
- **FFP** 4 units for every 6 units of red cells or PT/ aPTT > 1.5 x normal (12–15 ml/kg or total 1 litre). PCV and FFP can be given in a ratio of 1:1 and 1:2.
- **Platelets concentrates** if Platelet count < 50,000
- **Cryoprecipitate** if fibrinogen < 1 g/l
- **Fibrinogen concentrate,** a virally inactivated lyophilized powder that can be stored at room temperature, no thawing or blood typing is required, it restores fibrinogen levels rapidly.
- **Recombinant factor VIIa** is an effective, though expensive, synthetic agent used to control bleeding in refractory PPH. It should be given only when hematocrit is adequate, platelet count is >50x10^9/l, fibrinogen >1 gm/l, pH>7.2 and temperature >34°C. Dose is 90 µg/Kg IV over 3-5 minutes, repeated only if necessary. Its use may lead to thrombotic complications.
- **Intra Operative Cell Salvage -** It is an option in women who refuse traditional blood transfusion as well as in MOH situations. It contains only red cells with essentially no platelets or clotting factors. The risk of amniotic fluid embolism is very low if leucocytes depletion filter is used.[3]

Investigation

- Baseline haemogram, coagulation tests, LFT, RFT
- Viscoelastic test like Thromboelastography (TEG) and Thromboelastometry (ROTEM) can test whole blood coagulation, clot strength, stability and lysis can be used[4]
- The best marker for developing coagulopathy and blood loss is well correlated by fibrinogen levels, which is also an early predictor of severity of PPH, a level of < 2 gm/l has a 100% Positive Predictive Value (PPV) for severe PPH

Arrest of Bleeding

Management should be cause-oriented. One or more causes can be present simultaneously.

- Massage the uterus
- Check to see if the placenta has been expelled, and examine the placenta to be certain it is complete.
- Examine the cervix, vagina and perineum for tears.

Pharmacologic Management

Medications	Dose	Remarks
OXYTOCIN	5 IU slow IV (may have repeat dose) Or 40 IU /500 ml Hartmann's solution at 125 ml/ hour	Overdose or prolonged use can cause water intoxication. Fast IV may cause hypotension
CARBETOCIN	100 µg diluted in 10 ml NS and administered slowly (over 30-60 seconds) IV	Can be administered only with Regional/ Epidural anaesthesia
ERGOMETRINE	0.5 mg slow IV/IM	Cannot be given in patients with Hypertension, vascular disease, hepatic or renal dysfunction, sepis or PLHA taking protease inhibitors
CARBOPROST	250 µg IM every 15 minutes up to 8 times; Direct Intra myometrial 0.5 µg (under responsibility of administering clinician)	Contraindicated in patients with asthma, renal, hepatic or cardiac disease
MISPOPROSTOL	1000 µg rectally	Avoid in patients with Cardiovascular disease
TRANEXAMIC ACID	Slow IV bolus of 1gm followed by further 1 gm four hours later	Can be repeated after 30 minutes

Mechanical Methods

- **Uterine massage**
- **Bimanual uterine compression**
- **Tamponade**- WHO recommends the use of intrauterine balloon tamponade (IUB) for atonic PPH unresponsive to uterotonics or when uterotonics are unavailable.

  Uterine balloons such as the Sengstaken tube, Bakri and Rusch balloons are available but are expensive. Condom balloon tamponade (Shivkar's Pack) is a cost effective option but does not having a drainage port and therefore assessment of actual blood loss is not possible.

  Various modifications of condom catheter have been used including the use of surgical gloves in place of condom.

  CG Balloon is also a variation of condom balloon. From the drainage tube of the catheter, two rings of 1–2 mm width are cut. Excise the bulb of the catheter after inflating it with air. Unfold the condom over

distal one-third of the catheter. Condom is secured over catheter by the rings leaving 1.5–2 cm from both the ends of condom. Excise the tip of the Foley's catheter and condom together to facilitate drainage of blood. It allows drainage and uses rings cut out of catheter only and not the thread to tie the condom to catheter which avoids loose/too tight knots, saves time and is simple to use. Figure 2

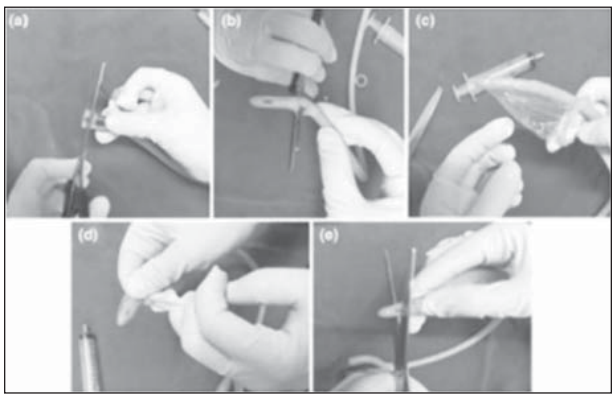


Figure 2

Belfort-Dildy Obstetrical Tamponade System has an upper uterine balloon (capacity750 ml) and a lower vaginal balloon (capacity 300 ml). It prevents displacement of the uterine balloon and obviates the need for vaginal packing. Figure 3

Figure 3

Surgical Methods

Uterine compression sutures: They cause mechanical compression of the uterine vascular sinuses without occluding uterine arteries or uterine cavity. Several techniques like B-lynch, Cho-square sutures, Hayman sutures, Pereira suture, Dr Gunasheela's global stitch, Cervico- Isthmic Compression sutures etc. have been used. Complications like pyometra, endometritis, sepsis, ischemic uterine necrosis, uterine suture erosion, uterine synechiae have been reported. Modifications of these techniques have been tried to ease the procedure and avoid complications.

M**odified Lynch suture** for cases of placenta previa or lower segment bleeding has been tried as a salvage procedure. Sutures are passed around uterus in a figure of eight fashion. Tighten this suture. Then both the ends of the tightened suture that is end containing the needle and the free end, both are passed through avascular area in the broad ligament from anterior to posterior and then, tightening of the transverse suture is done. The transverse limb ligates the uterine artery with more compression on the lower segment.[5] Figure 4

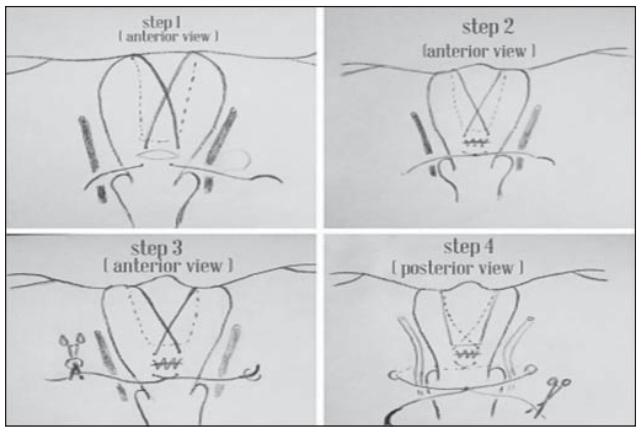


Figure 4

Uterine flexion suture technique can be tried to avoid re-opening the uterine cavity. The uterus is held in anteflexion position by an assistant, then the suture is pulled under moderate tension to hold the uterus in the flexion position, and the suture is tied securely.[6] Figure 5

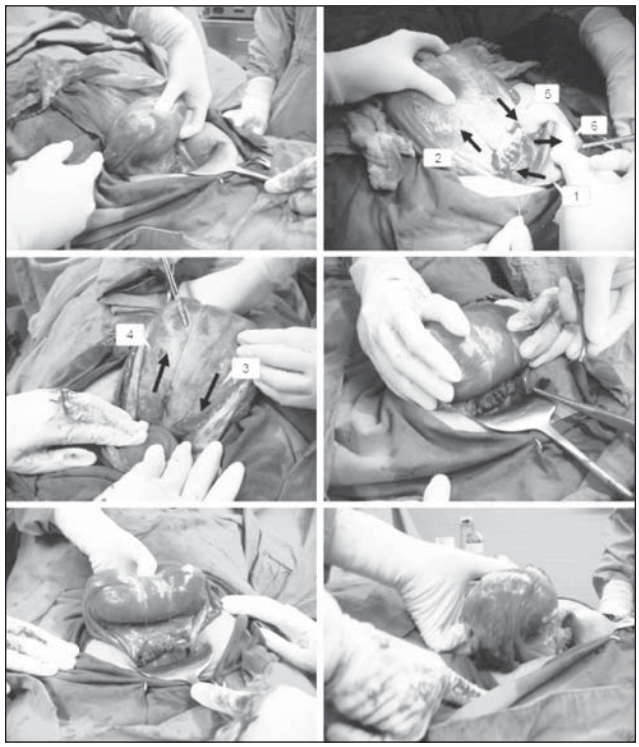


Figure 5

A **removable uterine brace suture** which compresses uterus against the pubis has also been tried. Stitch is applied running through the full thickness of anterior abdominal wall immediately above the pubis and 2cm laterally from the median line, through the uterus passed over as a brace to compress the uterine fundus by approximately 3 or 4cm inside the cornua and then taken out of abdominal wall. Sutures are tied and removed 24-48 hours later without anaesthesia. Figure 6

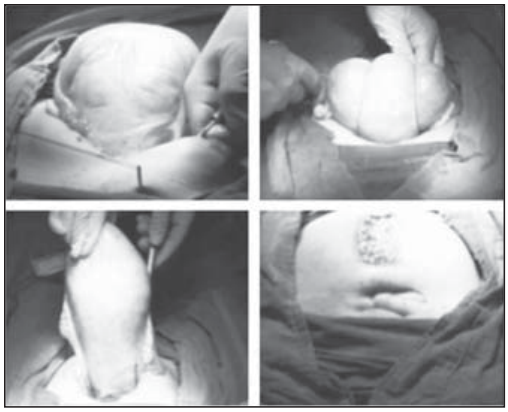


Figure 6

Stepwise De-vascularization

The objective is to decrease blood flow to the uterus when medical therapy is unsuccessful.

1. Bilateral uterine artery ligation
2. Bilateral ovarian artery ligation
3. Internal iliac artery ligation

Hysterectomy: Hysterectomy is the traditional treatment for cases of refractory PPH, when all other methods to arrest bleeding fails.

Triple P procedure: It is a conservative surgical alternative to peripartum hysterectomy for women with morbidly adherent placenta. The procedure entails **P**erioperative **P**lacental localization and delivery of foetus via transverse uterine incision above the upper border of placenta, **P**elvic devascularization and **P**lacental non-separation with myometrial excision followed by reconstruction of the uterine wall. This procedure requires the use of prophylactic Hypogastric artery occlusion which may not be universally available in low-resource settings.[7]

Radiological Management

- **Uterine Artery Embolisation**
- **Intravascular Aortic Balloon Occlusion (IABO)** - An infrarenal balloon is placed in aorta through femoral artery which is inflated after delivery of baby. To prevent reperfusion injury, it is deflated every 20-30 minutes for 2 minutes. It has similar results as internal lilac artery occlusion but requires further research by using control group before regarding this method, as an ancillary procedure of choice during scheduled Caesarean hysterectomy.

Temporizing Measures

- **Pelvic packing**- Abdominal and Pelvic packing is an age-old concept where a number of gauze bandages are tied end-to-end to pack the pelvis tightly and tamponade the haemorrhage after hysterectomy. The free end of the gauze is extracorporealized through one end of the main incision and the abdomen is closed in the usual fashion. Alternatively, a sterile towel is used to pack the cavity and abdomen is left open. This procedure however, requires re-laparotomy after initial stabilization to remove the packing materials.
- A variation to this is to fill a sterile plastic bag or cloth container with gauze and place it against the pelvic bleeders. The drawstrings are pulled through the vagina and attached to a weight, which provides traction so that the pack exerts pressure against the pelvic floor. This is known as umbrella, parachute, mushroom or logothetopoulos pack. Re-laparotomy is usually not required and the pack can be removed transvaginally without anaesthesia. Figure 7
- **Gelatin-Thrombin Matrix** - Use in obstetrics is limited to a few cases in the context of postpartum hemorrhage. GTM is a hemostat consisting of bovine-derived gelatin matrix and human-derived thrombin. Its quick hemostatic action in arterial spurting wounds is better than traditional gelatin cellulose as it contains thrombin which converts fibrinogen into a stable fibrin clot.[8]

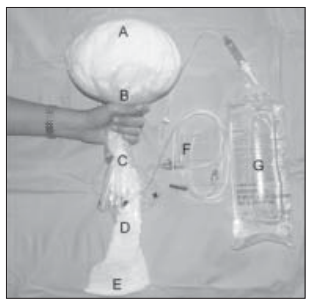


Figure 7

- **External aortic compression -** significantly reduces blood flow to the pelvic organs. It has traditionally been accomplished manually by applying pressure with a closed fist on the abdominal aorta slightly to the patient's left and immediately above the umbilicus. Recently, the external aortic compression device (EACD), a handmade spring device held in place by a leather belt, is being used as a first aid temporizing intervention. Figure 8

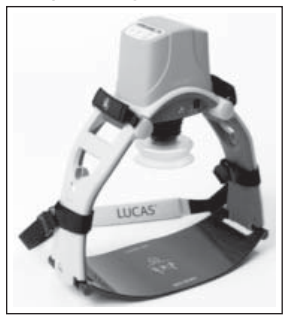


Figure 8

- **Non-pneumatic anti-shock garment (NASG)** - lightweight, re-usable lower-body compression garment made of Neoprene and Velcro. It increases blood pressure by decreasing the vascular volume and increasing vascular resistance within the compressed region of the body, but does not exert pressure sufficient for tissue ischemia. It reverses

shock by returning blood to heart, lungs and brain. Additionally, NASG decreases bleeding from the parts of the body compressed under it. It has been designed to allow perineal access so that examinations and vaginal procedures can be performed without it being removed.[9] **Figure 9**

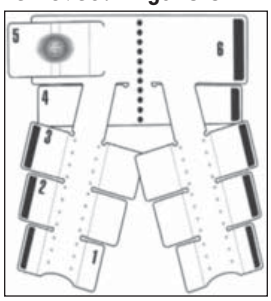


Figure 9

Summary

Globally PPH is the leading cause of maternal mortality and morbidity. Prevention plays a very important role by identifying high risk factors and active management of labour is the single most important factor which has significantly reduced the incidence of PPH. However it is still a commonly encountered complication . Newer drugs, devices , techniques and procedures are being constantly added to the existing armamentarium suggesting that we are yet to perfect our management skills to overcome this complication. Prompt recognition and timely action through multidisciplinary approach is essential for effective management of severe obstetric haemorrhage so that mortalities are averted.

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Forthcoming Events

- Next Monthly Clinical Meeting on 25th January, 2019 at Dr RML Hospital.
- Live Endoscopy Workshop on 7th February, 2019 under the aegis of Endoscopic committee of AOGD at MAMC Auditorium, New Delhi. Contact: Dr Devender Kumar 9968604407
- Global Conference on Reproductive Health with Focus on "Occupational, Environmental & Lifestyle Factors" to be held on 22nd – 24th February, 2019 at JNU Convention Centre, New Delhi. Contact: Dr J B Sharma 9868138205

CONTROVERSY

Morbidly Adherent Placenta: Hysterectomy vs conservative management


Dr Chandra Mansukhani

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[1]Senior Consultant, [2]Research Officer, Sir Ganga Ram Hospital, New Delhi

Abstract

Morbidly adherent placenta is a grave pregnancy complication. Augmented risk of morbidly adherent placenta has enhanced throughout the previous years. Their management is controversial. Caesarean hysterectomy, considered as the gold standard treatment, is attributed to increase the risk of maternal morbidity and mortality. Conservative management has been sought to diminish the rates of maternal morbidity associated with caesarean hysterectomy while maintaining fertility. It consists of leaving the placenta in-situ however under prolonged observation. The objective of this chapter is to wad the risk factors and associated controversies related to morbidly adherent placenta and assist the obstetrician-gynaecologist in choosing the most suitable line of treatment for women with Placenta accreta Spectrum (PAS) disorders.

Introduction

Placenta accreta spectrum (PAS) is a term which represents all the types of abnormal placental invasion into the uterine tissues (morbidly adherent placenta), and is allied with high maternal and neonatal morbidity and mortality.

The frequency of PAS has been increasing over the years with the escalating rate of caesarean deliveries. It is estimated to be 1: 533 of the total pregnancies for the years 1982-2002, whereas it was 1:4027 in the year 1970 and 1: 2510 in the year 1980[(1)].

In the presence of placenta previa,(when placenta is located in the lower uterine segment either partially or completely covering the internal os) the incidence of placenta accreta was found to be 3%, 11%, 40%, 61% and 67% with 1st 2nd, 3rd, 4th, 5th or more caesarean deliveries placenta previa with no previous history of uterine surgery is associated with only 1: 5 of placenta accreta[(2)]

On Ultrasound examination with color Doppler, placental lacunae -irregular vascular spaces inside the placenta which keep on increasing and are like **moth eaten** or **swiss cheese** on appearance with large vessels running from the base of the placental bed are most predictive with a sensitivity of 79% and PPV of 92%[(3)] Dwindling of the myometrium with loss of clear space between the uterine serosa and the bladder interface along with increase in the vascularity, or incursion of the placenta into the bladder adds extensive value to the diagnosis of PAS[(4)]. Presence of echo lucent area between placenta and bladder in a low lying anterior placenta rules out morbidly adherent placenta (MAP) with high PPV[(5)].

MRI as a diagnostic tool is required only if the placenta is posterior and not easily assessable on USG, and also in certain cases to have a better idea of the depth of placental tissue invasion in the uterus or surrounding structures.

Controversies in the Management of Placenta Accreta Spectrum Disorder Cases:

Treatment of woman with PAS or morbidly adherent placenta starts right from the period of its suspicion or diagnosis. Clinical history of the pregnant woman along with an ultrasound scan between15-20 weeks aids in the diagnosis of PAS.

Definitive treatment of morbidly adherent placenta or PAS is hysterectomy after delivery of the fetus. But risk of performing unnecessary hysterectomy (false positive) or risk of secondary bleeding due to attempted placenta removal (false negative) should always be carefully evaluated. Assessing the PPV and NPV becomes mandatory before planning an appropriate management of the patient. This is achieved by calculating the sensitivity, specificity and predictive value of the sonographic criteria's which includes the risk factors along with presence of placenta previa. The diagnosis of placenta accreta can be suspected if there are more than six lacunae having turbulent flow and hypervascularity of the uterine serosa-bladder wall interface. The later feature depicts remarkable performance with highest PPV and NPV. With a high PPV aggressive management is justified, similarly a high NPV favors removal of placenta without risks of a major bleed[(6, 7)].

Conservative management of PAS disorders includes leaving the placenta partially or totally in situ, without removing it forcefully Conservative methods include surgical as well as non-surgical options. Various conservative methods to preserve the uterus in PAS cases have been described in several case reports. In the current literature, different treatment options to preserve the uterus include –**expectant management, embolisation of uterine arteries, methotrexate therapy and uterus preserving surgeries.**

1. *Expectant Management*: If there is no clinical evidence of PAS and there is a false positive prenatal

diagnosis or the PAS disorder is limited to a very small portion of the uterine wall, the placenta should be removed gently to reduce the villous tissue left in situ [6].

The disadvantage with this attempt is the risk of massive obstetric haemorrhage which can follow and necessitate emergency hysterectomy.

2. *Methotrexate as an adjuvant treatment*: Use of methotrexate to expedite placental resolution has been proposed on the basis of case reports but no control studies have been reported [7]. Methotrexate even exposes the patient to the risk of neutropenia or medullar aplasia .It can even precipitate other possible complications, such as secondary infection of a placenta left in situ[8].
3. Preventive surgical or radiological uterine *devascularisation*: Preventive devascularisation can be achieved by surgical or interventional radiological procedures- like stepwise uterine surgical devascularisation, bilateral uterine or hypogastric artery surgical ligation, uterine artery embolisation, or balloon occlusion. High maternal morbidity is also associated with embolisation.

Balloon catheters in the iliac arteries in cases of PAS disorders is even more controversial, mainly due to higher risks of complications than with embolization. Complications include popliteal and or external iliac arterial thrombus, leg pain and weakness without swelling, buttock claudication and abdominal pain is also reported [9,10].

High intensity focused ultrasound (HIFU) has recently been used in the treatment of PAS disorders after vaginal delivery, but its safety and efficiency remains to be demonstrated in larger prospective trials [11]. There has also been no histopathology report to differentiate PAS from retained placenta in these cases

Coagulopathy or septicaemia may lead to need of emergency secondary hysterectomy. Serum ßhCG should be done weekly, low levels do not guarantee complete placental resorption hence ultrasound evaluation is also recommended

Alternative Conservative Surgical Procedures

1. *One step conservative surgery*
   It involves partial resection of the myometrium along with the invasive placental tissue followed by uterine reconstruction and bladder reinforcement. The advantage of this method is uterine preservation along with reduced risk of secondary infection and bleeding.

   It can be used in low and middle income group countries without the additional cost of interventional radiological procedures. To further achieve successful control of bleeding and better hemostasis during operation a step wise devascularisation can be done.

2. *The Triple P procedure*
   A recent uterine sparing procedure for PAS called the "Triple P procedure" has been proposed[12,13]. This procedure avoids incision on the vascular placental venous sinuses, and include excision of the myometrium containing the morbidly adherent placental tissue followed by closure of the uterine defect. The procedure includes:

   (1) Preoperative ultrasound localization of the superior edge of the placenta;

   (2) Pelvic devascularisation is done by prior placement of intra arterial balloon catheters in the anterior division of the internal iliac arteries.

   (3) No attempt to separate placenta and excision of portion of myometrium containing the adherent placenta and reconstruction of uterine wall.

3. *Cervix as a natural tamponade technique*.
   Cervix can be used as a natural tamponade in cases of placenta previa and placenta previa accreta. After delivery of fetus and removal of placenta, anterior lip of cervix can be stitched to anterior uterine wall and posterior lip to posterior uterine wall in lower segment to control severe bleeding.

   Patient is watched for bleeding from the operative site and vagina, if there is no bleeding uterine incision is closed. Patient is reassessed after three months and six months.

   This technique was successful in stopping bleeding in 38 out of 40 patients as reported by El Gelany et al in 2015. The complications included bladder injury and wound infection[14].

   A systematic review on various uterus preserving treatment modalities was done in 2011 by Charlotte H et al. This review included 50 case series or case reports. In this review need of secondary hysterectomy was higher in uterine preserving treatment (31%) as compared to expectant management (19%) and embolization (18%). Maternal mortality was also higher with uterus preserving modalities (4%)[15].

In a French multicenter retrospective study in 2018 by Loic et al, uterine preservation modalities were done in 78% (95% CI, 71%-84%) out of 167 case of PAS. Complications associated with conservative treatment were, septic shock following severe sepsis and peritonitis, uterine necrosis and rupture; and fistula due to injury to adjacent organs. Other severe complications reported were renal failure, pulmonary edema, pulmonary embolism and maternal death in 6% (10) patients. Fistula and arteriovenous fistula formation has also been reported[6].

Non-Conservative Surgical Management

Hysterectomy in patients with PAS is a better choice of treatment which does not have the risk of secondary hemorrhage, infection and sepsis and coagulopathy later on.

But hysterectomy has its own disadvantage in women requiring future fertility, extensive surgery in cases of placenta percreta may lead to damage to surrounding organs depending on the extent of placental invasion and their involvement.

In a recent systematic review and meta-analysis of outcome of placenta accreta spectrum diagnosed prenatally, 89.7% cases required elective or emergency hysterectomy [16]

As per FIGO consensus guidelines on placenta-aecreta spectrum disorders-

a) Hysterectomy is a definitive surgical treatment, especially for invasive forms.

b) Primary elective caesarean hysterectomy is the safest and most practical option for most low and middle income countries where diagnostic follow up and additional treatments are not available. [17]

Planned delayed hysterectomy

Delayed hysterectomy in complex cases may reduce other surgical morbidity. Delayed hysterectomy by open method, minimal invasive approach including robotics have been reported [18, 19, 20]

"Conservative modalities in PAS cases can be considered only in selective cases after proper evaluation in only tertiary care centres with multi-disciplinary team care"

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CASE APPROACH

Obstetric Hemorrhage due to Coagulopathy (Abruption and Hepatitis)


Dr Abha Sharma

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Introduction

Obstetric haemorrhage is a challenging emergency and requires prompt resuscitation and management to prevent maternal morbidity and mortality. Since the estimated blood loss is often inaccurate and under-estimated, recognition of severity of obstetrical haemorrhage is crucial to its management. Although the causes of obstetric haemorrhage are many, our article mainly focuses on haemorrhage due to Abruption and Hepatitis induced coagulopathy.

Disseminated intravascular coagulation (DIC) also known as consumption coagulopathy or defibrination syndrome; is a clinicopathological phenomenon initiated by an underlying disorder resulting in disruption of finely controlled process of haemostasis.[1]

Physiology and Pathogenesis

In pregnancy, levels of most procoagulants increase. This is especially marked for fibrinogen, Von Willebrand factor and factor VIII, with levels typically increasing by 100%.[2]At the same time natural anticoagulants like protein C, S and antithrombin levels decrease. There is also increased inhibition of fibrinolysis. All these alterations make pregnancy a procoagulant state.

Coagulation is mainly initiated by tissue factor or thromboplastin (a glycoprotein found in highly vascularized organs brain, lungs and placenta) that combine with factor VII or VIIa. The end result of this process is fibrin formation which is then balanced by fibrinolytic system to lyse it. This results in production of fibrinogen-fibrin split products which includes D-dimers.

Placental abruption may be associated with rapid consumptive coagulopathy characterised by hypo fibrinogenaemia and thrombocytopenia with clinically severe haemostatic impairment. There is elevation of fibrin degradation products and D-dimer. Secondly it may also be associated with atonic PPH and couvelaire uterus thus causing further haemorrhage .

In **acute fatty liver of pregnancy and cases of hepatitis**, the associated coagulopathy is attributed to decreased production of procoagulants in liver. But evidence suggests that in cases of acute fatty liver of pregnancy consumptive coagulopathy also develops leading to DIC and hypo fibrinogenemia.

Prevention

Abruption

High risk factors for abruption like PIH should be adequately treated. H/O smoking , grand multiparity or abruption in previous pregnancy should also alert the clinician. In hydramnios sudden decompression of uterus is avoided by slow drainage of amniotic fluid.

If abruption occurs, should be diagnosed at the earliest and steps taken to reduce incidence of coagulopathy by

- ARM to reduce intrauterine tension, this may reduce further bleeding as well as reduce entry of thromboplastin in circulation
- Start oxytocin drip to cause uterine contraction
- Plan to deliver vaginally within six to eight hours; however if not possible LSCS should be done as abruption to delivery duration is the biggest determinant of development of coagulopathy and other complications

Hepatitis

All cases of hepatitis should receive Inj Vitamin K 10 mg I/M along with other supportive therapy. Induction of labour should be avoided till signs of recovery are present and coagulation disorder has resolved.

Diagnosis

Investigations to ascertain coagulation status should be sent in all cases of abruption and hepatitis and specifically include

- complete haemogram with platelet count
- prothrombin time (PT)
- activated partial thromboplastin time (APTT)
- serum fibrinogen level
- serum FDP
- D Dimer
- Bed side clotting time and clot retraction time give a rough idea of coagulation status

Management

Blood and Blood Component Therapy

The initial step requires insertion of two large bore intravenous cannulas to administer fluids if patient is in shock, crystalloids are preferred over colloids. For massive abruption ,the recommended initial transfusion ratio for packed red blood cells: fresh frozen plasma (FFP): platelets is 1:1:1 as this mimics replacement of whole blood[4]and prevents dilutional coagulopathy. As a rough guide for major haemorrhage, 4 units each of

blood, FFP and platelets are to be given. If associated pulmonary oedema is present cryoprecipitate instead of FFP is a better choice.

Blood components commonly transfused in obstetric haemorrhage due to coagulopathy include (as recommended by RCOG[5])

1. Whole blood – each unit has a volume of about 500ml and contains RBCs, plasma, 600-700mg fibrinogen but no platelets. Increases haematocrit 3-4 volume percent per unit
2. Packed RBCs – Each unit has a volume of 250-300 ml and contains RBCs, minimal fibrinogen and no platelet. Each unit increases haematocrit 3-4 volume percent.
3. Fresh Frozen plasma(FFP) -each unit of 250 ml contains clotting factors,600-700mg fibrinogen but no platelets. 15ml/kg is transfused if PT/aPTT is >1.5 times normal.
4. Cryoprecipitate – each unit of 15 ml contains 200mg of fibrinogen, other clotting factors but no platelets. Two pools(10 units) cryoprecipitate is transfused if fibrinogen level is less than 1g/l. Two pools is expected to raise fibrinogen level by about 1g/l in an average woman.
5. Platelets – each unit of 50 ml raises platelet count by about 5000/ml.

Main therapeutic goals of management of massive haemorrhage is to maintain-

- Haemoglobin > 8g/dl
- Platelet count > 50,000/ml
- Prothrombin time < 1.5 times mean control
- aPTT < 1.5 times normal
- Fibrinogen >1.0g/l.

Newer products for treatment of coagulopathy are:

Fibrinogen concentrate – virus inactivated fibrinogen concentrate has been used to correct hypo-fibrinogenaemia. Each gram of this raises fibrinogen level approximately 40mg/dl. Data regarding its usage in PPH and DIC is limited.

Prothrombin complex concentrate – are human plasma derived concentrates of vitamin K- dependent clotting factors. Their role in PPH has limited evidence.

Recombinant Activated Factor VII – this synthetic vitamin K-dependant protein (Novoseven) binds to exposed tissue factor at the site of injury to generate thrombin and activate the coagulation cascade. RCOG suggests its use in life threatening PPH and recommends that the fibrinogen level should be >1g/l and platelet count more than 20,000/ml.

Role of Tranexamic Acid – A large randomised international trial, the WOMAN trial compared 1g of intravenous tranexamic acid to placebo in PPH. Presently its use in obstetric haemorrhage lacks proper evidence.

Obstetric Management

In Abruption, Once coagulation is deranged and fetus is dead, all efforts should be directed to deliver vaginally with simultaneous correction with blood and blood components. In this situation maternal outcome depends more on the adequacy of blood product replacement, and less so on the interval to delivery as surgical management is also highly risky in DIC.

Post Partum Haemorrhage is often encountered in patients with coagulopathy due to abruption or Hepatitis and the Obstetrician should anticipate it and be prepared for it. Episiotomy and vaginal tears should be avoided. Non surgical methods are given preference. In case of PPH

- Rule out traumatic PPH
- Manual compression of uterus
- Oxytocics : Syntocinon drip , misoprost and carboprost
- Bakri Balloon or Condom Catheter should be inserted
- Blood and blood components replacement simultaneously
- Surgical methods (uterine devascularisation, compression sutures, hysterectomy) are used as a last resort. Important is to keep an intra peritoneal drain to keep watch on post operative haemorrhage

Thus, the management of coagulopathy in Obstetrics remains a major clinical challenge. Massive haemorrhage associated with DIC makes treatment even more challenging and complicated but early recognition, knowledge of underlying pathology and prompt correction of coagulopathy can avoid maternal deaths.

Suggested Reading

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DISTRESS TO DE-STRESS

The Relation Cure

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Dr Mohit D Gupta

"It's amazing how quickly someone can become a stranger;
it's even more amazing how quickly someone can become a treasured friend."

The journey of life is all about relationships. There are different levels of relations that one shares and experiences throughout the day.

1. **Relation with self:** How many times in our life we experience lack of acceptance for our own self ? How often do we blame ourselves? If this is so, the we need to heal it?
2. **Relationship with family:** Do we often experience pain in our relationships? Are there frequent episodes of annoyance and anger in a family? Is there lack of communication and love between husband and wife? Between parents and children? if yes: then we need to heal them?
3. **Relationship at the level of society and profession:** Do we frequently disapprove of the behavior and ways of other person? Am I frequently affected by the situation and the person to the extent that I am very often uncomfortable? If yes, then I need to heal these.

It is quite evident that relation is often a bumpy ride for most of us at all levels. The bumps experienced are a mix of pain or pleasure, joy or sorrow, love or hatred, happiness or sadness, success or failures.

Here are some insights about people, relationships, and friendships from our journey that might be useful and comforting for us.

1. **Same situation: different views:** It is quite common to see differential response of different people in same situations. The inner strength, endurance, understanding is what determines our response. In fact, when we are unable to realize this, we experience pain because of other people. So, Perception is everything. Understanding the situation of other person often helps us to create a balanced response in every situation.
2. **Are we seeing the life through mirror or a window?** It is a universal truth that we see the people and situations as we are and not as they are. Infact, we look at life through our own personal filters, our own past experiences, beliefs, and paradigms. We see everything and everyone through our unique subjective lens that has been forming since we were younger. In this process, we loose the objective reality and start analyzing person and situations according to our comfort zone. This is unhealthy for relationships. **Let us today practice to see the life through a window: AS IT IS!**
3. **People and situations always come with a lesson:** Every person and situation come with a gift wrap; a lesson; our duty is to unfold it and learn. Analysis and more analysis only destroys our peace of mind and we embrace pain and depression in this process.

   We need to inculcate only two beautiful practices for a beautiful relation:

   IMMUNITY and FLEXIBILITY. Immunity to negativity (not absorbing negative words, behavior and actions) and flexibility (in adjusting to situations while maintaining humility).
4. **Create our own inner circle carefully:** Everything that we see, listen and talk about, we actually allow it to enter our mind and hence it becomes a part of our food for mind. It then strongly influences our energy aura. It has the power to destroy or reduce our aura or even make it negative (that commonly happens when we say we are unable to stand someone). Once we absorb and radiate positive energy, we can also increase our aura with positive energy and make it so powerful that can influence other people and situations. This shows that the essence of relationship cure is our capability to allow only positive energy to become part of our aura.
5. **Withholding criticism and statements:** It is said that you are master of your unspoken words and slave of your spoken words. Years of beautifully nurtured relationship can be destroyed by a single negative thought or words. If we want to cure our relationships, we need to guard our thoughts and words carefully.
6. **Actions speak louder than words:** Doing small things with great love is what heals relations. We can have the best intentions in the world, but our lives are measured by our actions. If you mean well but don't do well, no one can read your mind. At the end of the day, what counts is what we do.
7. **Vibrations can create magic:** When nothing else works, silence in the mind, purity and love in thoughts can work wonders. Our thoughts have the power to reach every person for whom they are destined. Hence continuous thoughts that this is not going to work out is like weakening a already strained relation. So creating a beautiful relation starts from our powerful thoughts.

Let us choose to empower our mind by practicing few minutes of meditation in the morning and in evening. This is the simplest way to keep ourselves and our relations healthy.

Om Shanti

CROSSWORD

The Maze of Knowledge

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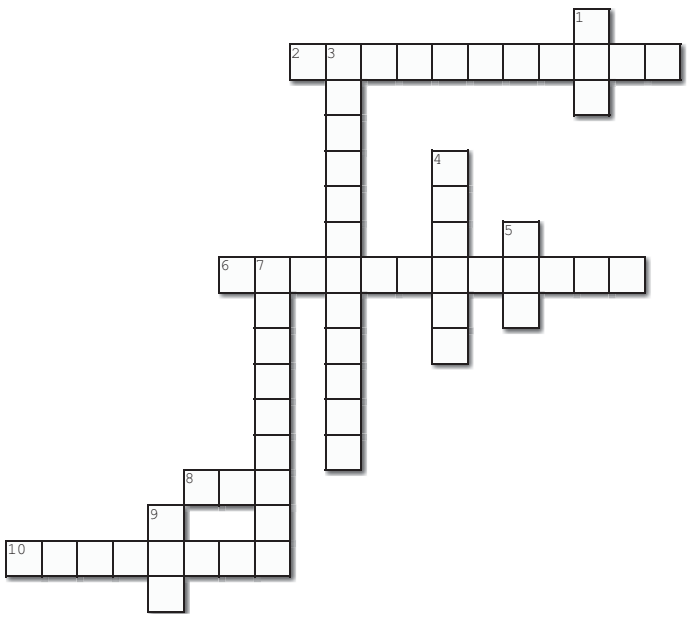
Associate Professor, Department of Obs & Gynae, LHMC & SSK Hospital, New Delhi


Dr Swati Agrawal



Down

1. Recommended treatment for uterine A-V malformation
3. Management of placenta acreta
4. First line therapy for adenomyosis
5. blood bank protocol essential for safe obstetric care
7. Differential diagnosis of endometrial polyp protruding through cervical os
9. Treatment of choice for AUB-O

Across

2. Indeginous balloon developed for management of PPH
6. drug used for medical management of fibroid uterus
8. Complication of abruptio placentae
10. Drug of choice for AMTSL

PICTORIAL QUIZ

A Picture is Worth a Thousand Words

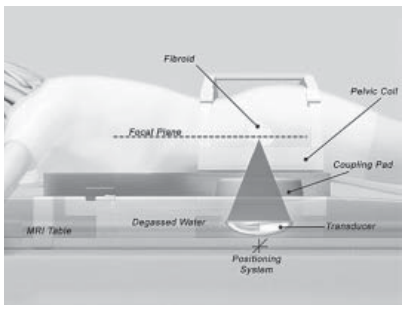


Figure 1:

Q1. Which procedure is the given figure depicting ?

Q2. List any 2 limitations of this procedure ?

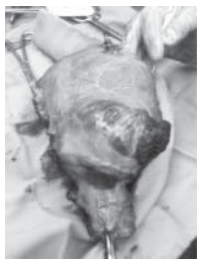


Figure 2:

Q1. Which pathology is the given figure depicting ?

Q2. What is the incidence of this condition in a woman with prev 1 CS with placenta praevia?

WhatsApp your answers to 9953938995.
The names of first three correct entries will be mentioned in our next issue.

Refer page 38 for previous answer key.

Events Held

- Guest Lecture on "Prevention and non surgical management of Pelvic Floor Dysfunction" on 21st December, 2018 at LHMC & SSK Hospital by Dr Bary Berghmans from Netherlands

- Monthly Clinical Meeting on 28th December, 2018 at Sir Ganga Ram Hospital

- Walk on "Walk for a Cause" "Prevention of Female Foeticide " on 2nd January, 2019 at LHMC & SSK Hospital, New Delhi


FOGSI PUBLIC AWARENESS COMMITTEE
in association with
Smriti
WALK FOR A CAUSE
02nd January 2019
ASSOCIATION OF OBSTETRICIANS & GYNAECOLOGISTS OF DELHI (AOGD)


WALK FOR A CAUSE

- "AOGD rocks" at AICOG Bengaluru

AOGD awarded "Champions of FOGSI - President's Appreciation Award" at AICOG 2019, Bengaluru

AOGD Best Society Award at AICOG 2019, Bangaluru

Dr Sudha Prasad, Vice President, FOGSI North Zone 2019

STANDARD OF CARE

AUB in Perimenopausal Women

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Dr Ratna Biswas

Introduction

Perimenopause is defined as the time around menopause and is frequently associated with the appearance of hot flushes and menstrual irregularity.

Abnormal Uterine Bleeding (AUB) is defined as the bleeding from the uterus that is abnormal in regularity, volume, frequency, or duration and occurs in the absence of pregnancy[1,2].

AUB is the most common presenting complaint affecting the women of reproductive age especially in peri menopause. One third of outpatient visits to the gynecologist are for AUB, and it accounts for more than 70% of all gynecologic consults in the perimenopausal and postmenopausal years[2]. Abnormal uterine bleeding with different menstrual patterns has significant effect on women's health and quality of the life leading to loss of productivity and is one of the main causes of hysterectomy. Due to lack of standard guidelines, there is remarkable inconsistency in diagnosis and management of AUB.

To standardize the nomenclature, FIGO in 2011 introduced the acronym PALM- COEIN (Polyp, Adenomyosis, Leiomyoma, Malignancy, Coagulopathy, Ovulatory dysfunction, Endometrial factors, Iatrogenic, Not defined). It is based on etio-pathogenesis of abnormal uterine bleeding with PALM describing structural causes and COEIN denoting non structural causes[1].

AUB in the perimenopausal women may be a normal phenomenon on one hand, due to the occurrence of anovulatory cycles during transition to menopause and yet on the other hand it may be a marker of a more serious condition like malignancy seen in women with advanced age. Up to eight years before menopause, women may have intermittent anovulatory cycles[3]. The goal of diagnostic workup is to rule out malignancy of the uterus and ovary (estrogen producing tumors) and establish an etiological diagnosis with as much accuracy as possible.

Diagnosis begins with a good history. Although many women may be unsure of how often or how long they bleed, a careful history on the pattern, duration and heaviness of flow goes a long way in establishing a diagnosis and formulating a plan of management. The history of menstrual cycles should be elicited on the grounds of the terminologies given below.

Recommended Terminology, Definitions, and Classifications of Symptoms of Abnormal Uterine Bleeding[3]

Disturbances of Regularity

- Irregular Menstrual Bleeding: Bleeding of >20 days in individual cycle lengths over a period of one year.
- Absent Menstrual Bleeding (amenorrhea): No bleeding in a 90-day period.

Disturbances in Frequency

- Infrequent Menstrual Bleeding: One or two episodes in a 90-day period.
- Frequent Menstrual Bleeding: More than four episodes in a 90-day period.

Disturbances of Heaviness of Flow

- Heavy Menstrual Bleeding (HMB): Excessive menstrual blood loss that interferes with the woman's physical, emotional, social, and material quality of life and can occur alone or in combination with other symptoms.
- Heavy and Prolonged Menstrual Bleeding (HPMB): Less common than HMB. It is important to make a distinction from HMB given they may have different etiologies and respond to different therapies.
- Light Menstrual Bleeding: Based on patient complaint, rarely related to pathology.

Disturbance of the Duration of Flow

Prolonged Menstrual Bleeding: Menstrual periods exceeding 8 days in duration on a regular basis.

Shortened Menstrual Bleeding: Uncommon, defined as bleeding of no longer than 2 days.

Irregular Nonmenstrual Bleeding: Irregular episodes of bleeding, often light and short, occurring between normal menstrual periods. Mostly associated with benign or malignant structural lesions. May occur during or following sexual intercourse.

Acute or Chronic

Acute AUB refers to an episode of heavy bleeding requiring immediate intervention to prevent further blood loss. Acute AUB may occur spontaneously or within the context of chronic AUB (abnormal uterine bleeding present for most of the previous 6 months)[1].

Diagnosis of AUB

History and examination

1. History focuses on identifying the type of AUB. It is recommended to use PALM –COEIN classification for diagnosis. Old overlapping terminologies should be avoided to maintain uniformity.
2. It is recommended by FOGSI to obtain thorough history and conduct physical examination to direct the need for further investigations and treatment.
3. History of use of medications like Anti-

Coagulants, Anti-Depressants, Acetyl salicylic acid, HRT, Tamoxifen, Corticosteroids, Thyroxine, Contraceptives, Phenothiazenes.

4. In Screening for coagulopathy, any of the following criteria should be considered as screen positive:
   a. History of heavy bleeding starting at menarche.
   b. One of the following
      - History of PPH, surgery related bleeding, bleeding with dental work.
   c. Atleast two of the following symptoms;
      - one or more episode of bruising per month
      - one or more episode of epistaxis per month
      - Frequent gum bleeding
      - Family history of bleeding symptoms
5. Ovulatory bleeding is usually cyclic and can be associated with midcycle pain, premenstrual symptoms, and dysmenorrhea.
6. Anovulatory bleeding occurs more frequently at the extremes of reproductive age and in obese women. It is usually irregular and often heavy[4]. Presence of high risk factors such as obesity, diabetes, hypertension in association with prolonged exposure to anovulatory cycles should prompt an endometrial sampling for evaluation of underlying premalignant or malignant pathology.
7. Family history of malignancy of breast, colon and endometrium should be carefully sought in women with perimenopausal AUB to look out for familial cancers.

A Pictorial Blood Loss Assessment Chart (PBAC)

PBAC originally given by Higham et al[5] is an important validated tool (Fig 1) for objective assessment of menstrual blood loss. It is pictorial representation of the number of flow days and amount of bleeding. At the end of a month the score of >100 denotes excessive menstrual blood loss. It should be included as standard of care for assessment of heavy menstrual bleeding. It may also be used to see the response to treatment by comparing the pre and post treatment charts.

Month: January 2019

	Pads			Tampons			Clots		Flooding	Score
Date	Light (1 pt each)	Medium (5 pts each)	Heavy (20 pts each)	Light (1 pt each)	Medium (5 pts each)	Heavy (10 pts each)	5 cent size (1 pt each)	50 cent size (5 pts each)	5 pts each episode	
1										
2										
3										
4										
5										
6		||	||			|		|	|	70
7		|||	||							55
8		|||||								25
9	||	||								12
10	||									2
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22										
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24										
25										
26										
27										
28										
29										
30										
31										
									Total	164

Each row represents a day of the month

Count the number of sanitary pads and/or tampons you use each day (24 hour period).

Calculate a score for each day, then add up the score at the end of the month.

Bleeding between periods - If you also experienced bleeding between periods that required sanitary protection please record this on the relevant days.

Clots – if you pass clots, please indicate this on the relevant days and the approximate size (ie. closer to an Australian 5 cent or 50 cent piece).

Flooding – if you experience any episodes of 'flooding'/overflowing/staining of clothing/underwear please indicate the number of episodes on the relevant days.

Double protection – if you have used both a pad and tampon simultaneously and both sanitary items were stained with blood don't forget to include both sanitary items on the PBAC.

PBAC Scoring System

Pads		
1 point	For each lightly stained pad	
5 points	For each moderately stained pad	
20 points	For each completely saturated pad	
Tampons		
1 point	For each lightly stained tampon	
5 points	For each moderately stained tampon	
10 points	For each completely saturated tampon	
Clots/Flooding		
1 point	For each small clot (Australian 5 cent coin)	
5 points	For each large clot (Australian 50 cent coin)	
5 points	For each episode of flooding	

Examination

General Physical and Systematic examination has to be done

Height, weight, BMI, pallor, thyroid, breast examination should be done. Abdominal examination, local examination, per speculum and bimanual per vaginal examination assessment completes the process of clinical evaluation

Recommended Investigations

Laboratory Testing

1. Complete blood count with peripheral smear should be done for all women with AUB.
2. Urine pregnancy test in suspected pregnancy.
3. Thyroid profile
4. Pap smear
5. Other tests like coagulation profile, hormonal profile may be done on individual basis

Imaging

1. Ultrasonography is the first line diagnostic imaging technique to evaluate uterus, adnexa, and endometrial thickness.

   Endometrial thickness (ET) is less sensitive for diagnosis of premalignant or malignant lesions in perimenopausal women than in postmenopausal women. Best time to perform a TVS examination for ET is at the end of the bleeding phase when the endometrium echo is thin. In a study of 433 perimenopausal women[6] an ET <5mm was seen in 64.7%, ET > 5mm in 25.1% and in 10 % the endometrial echoes were not well defined and these women underwent saline infusion sonography for further evaluation. In this cohort after the final evaluation 79% had anovulatory AUB, 13% had polyps, 5.3% had submucous myomas and 3.5% had endometrial hyperplasia.

   Transvaginal ultrasound (TVS) is 80% sensitive and 69% specific for fibroids and polyps and is superior to transabdominal ultrasound[7].
2. Doppler Ultrasonography is indicated in suspected arterio venous malformations, to differentiate between fibroids and adenomyosis and in malignancy.
3. 3D USG: It is non-invasive alternative to hysteroscopy. It is used to evaluate intracavitary and myometrial lesions, mapping and typing of myomas.
4. Saline Infusion sonography: To differentiate between endometrial polyp and submucosal myoma.
5. MRI is used for differentiating adenomyoma from

fibroids. Also used for mapping of fibroids while planning conservative surgical procedure and before therapeutic embolisation of fibroids. (GCPR-FOGSI Grade A;Level 3)[8]

Recommendations for Endometrial Sampling

Endometrial sampling is recommended in perimenopausal women presenting with AUB and also in younger women with high risk factors for carcinoma endometrium. (GCPR-FOGSI Grade A; Level 2)[8]

Although Endometrial aspiration should be the preferred method for the sampling of endometrium other sampling modalities like fractional curettage or dilatation and curettage may be also appropriate. Stovall and colleagues[9] performed endometrial biopsy by disposable suction piston devices (endometrial aspiration biopsy sampler) in 40 women on outpatient basis and diagnosed carcinoma in 39 women with an accuracy of 97.5%. This study was much publicized, promoted and accepted as the standard of care for diagnosis in AUB. However in a similar study Guido[10] and colleagues performed endometrial biopsy in 60 women with known cancer prior to surgery and missed out diagnosis in 11 (84% accuracy and 16% false negative rate). But importantly on cut open specimen of uterus it was observed that the biopsy was 100% accurate when more than 50% of the cavity was involved. Others have found an accuracy of 68-80% for endometrial biopsy in detection of malignancy.

Endometrial Sampling for Precancer Diagnosis (ACOG Practice Committee Opinion 6 13, May 2015)[11]

1. The accuracy of D&C compared with endometrial suction curette in diagnosis of premalignant lesions and excluding concurrent carcinoma is unclear. Both have sampling limitations: approximately 60% of D&C specimens sample less than one half of the uterine cavity and 40% of endometrial hyperplasia are missed on endometrial biopsy[12,13,14].
2. Dilation and curettage and endometrial suction curette sampling devices have been reported to yield equal rates of cancer detection in patients with abnormal uterine bleeding.
3. A single-institution retrospective series found that D&C used to diagnose endometrial intraepithelial neoplasia was less likely to miss cancer (which was evident on subsequent hysterectomy) than the use of endometrial suction curette (27% compared with 46%, respectively[15]
4. Mass lesions that impinge upon the uterine cavity may deflect flexible endometrial suction curette devices, which prevents adequate assessment of the endometrial cavity.
5. Hysteroscopy with directed biopsy is more sensitive than D&C in the diagnosis of uterine lesions[16]
6. Hysteroscopy is recommended when there is focal rather than global involvement of endometrium. This provides the best opportunity to confirm the diagnosis of a true premalignant endometrial lesion and exclude an associated endometrial carcinoma.
7. Current diagnostic scheme should include an assessment of sample adequacy, as is recommended for evaluation of cervical cytology specimens[17]
8. Hence it is important to have adequate sample for evaluation and a thorough D&C in OT may be a better than a OPD based endometrial sampling in context to adequacy of sample when pre malignant or malignant lesions are suspected. Hysteroscopy is indicated when the lesion is focal or when biopsy /D & C samples are inconclusive.

Management of AUB

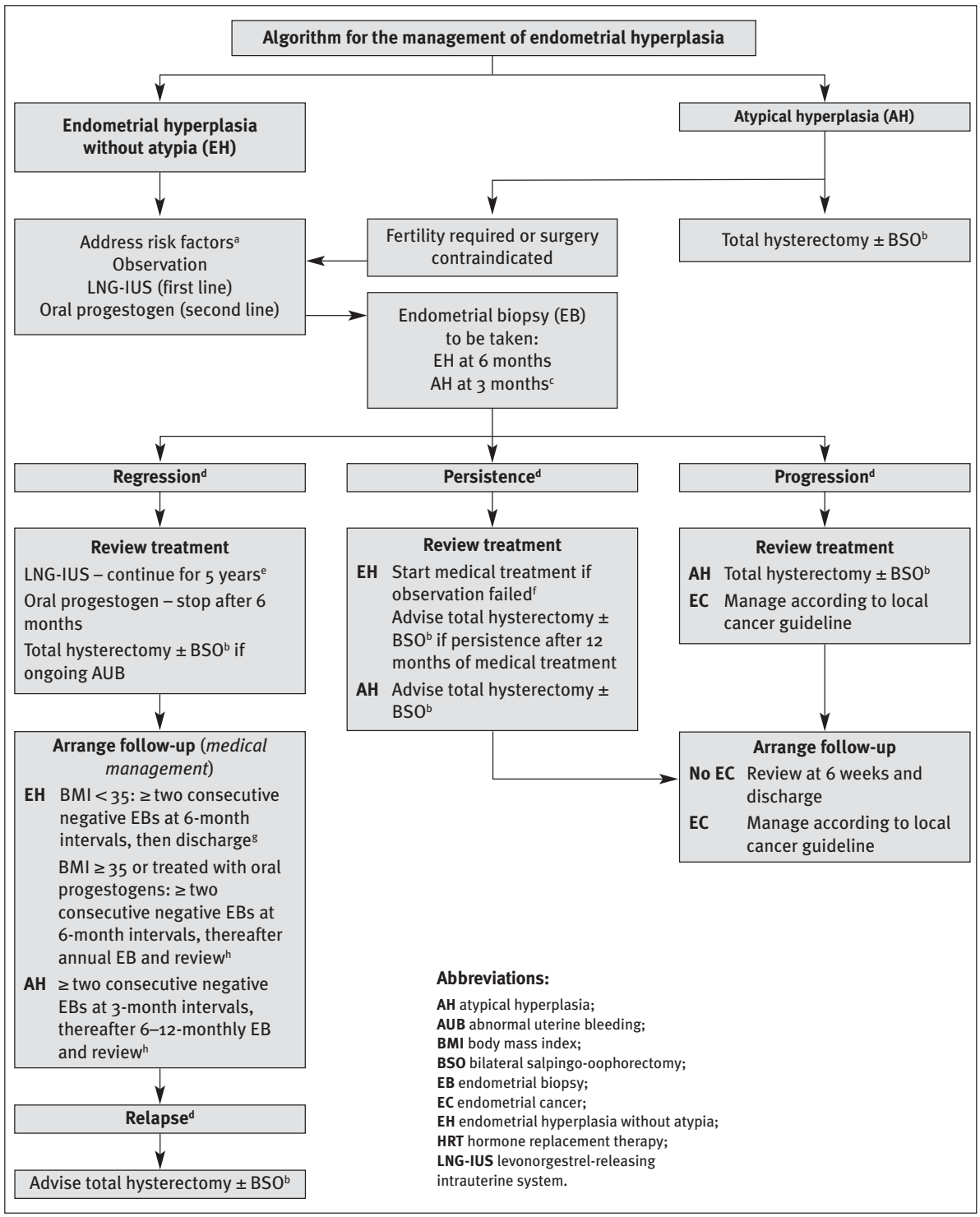
The treatment of perimenopausal bleeding must always be directed by the proper diagnosis. Treatment goals for patients with AUB includes regularisation of menstrual cycles, minimizing the blood loss and thus anaemia , improvement in the quality of life, re-assurance in case of dysfunctional anovulatory bleeding.

AUB- M (Malignancy and Endometrial Hyperplasia)

Table 1: New WHO classification of endometrial hyperplasia[20]

New term	Synonyms	Genetic changes	Coexistent invasive endometrial carcinoma	Progression to invasive carcinoma
Hyperplasia *Without t*atypia	Benign endometrial hyperplasia; simple non-atypical endometrial hyperplasia; complex non-atypical endometrial hyperplasia; simple endometrial hyperplasia without atypia; complex endometrial hyperplasia without atypia	Low level of somatic mutations in scattered glands with morphology on HE staining showing no changes	<1%	RR: 1.01–1.03
Atypical hyperplasia/ Endometrial intraepithelial neoplasia	Complex atypical endometrial hyperplasia; simple atypical endometrial hyperplasia; endometrial intraepithelial neoplasia (EIN)	Many of the genetic changes typical for endometrioid endometrial cancer are present, including: micro satellite instability; *PAX2*inactivation; mutation of *PTEN*, *KRAS* and *CTNNB1* (ß-catenin)	25-33% 59%	RR: 14–45

Management of Endometrial Hyperplasia[21]



AUB-P (POLYPS)

- Polyps should be managed by hysteroscopic polypectomy and sample should be sent for histopathology. LNG -IUS insertion can be considered after polypectomy in women with multiple endometrial polyps and desirous of contraception. It should be inserted if histopathology is benign(GCPR-FOGSI Grade A; Level 2)[8]. If histopathology shows malignant changes in polyp, standard protocol should be adopted for management of malignancy.

AUB-A (ADENOMYOSIS)

- The management of adenomyosis depends on the age of the patient, severity of the symptoms, associated conditions like fibroid, endometriosis, polyps.
- In perimenopausal women GnRH agonists with add

back therapy or LNG-IUS can be used for medical management. Add-back therapy is recommended when GnRH agonist is used for more than 6 months to reduce the hypoestrogenic side- effects such as vasomotor symptoms and loss of bone mineral density[18]

- Medical management for symptomatic relief includes NSAIDS, Progestogens, Danazol, Antifibrinolytics (GCPR-FOGSI Grade B; Level 4)[8].
- Surgical management includes adenomyomectomy which is not preferred in perimenopausal age group. Hysterectomy (Abdominal / Laparoscopic / Vaginal) is indicated in patients with failure of medical management (GCPR-FOGSI Grade A; Level 1)[8].

AUB- (LEIOMYOMA)

- Treatment of leiomyoma should be individualized based on the presenting clinical symptoms, size and location of fibroid, and the patient's desire for conserving the uterus.
- In perimenopausal women, medical treatment may be employed to alleviate the symptoms until the menopause(GCPR-FOGSI Grade A; Level 1)[8].
- In women >40 years with symptomatic fibroid not desiring fertility, hysterectomy is recommended. However LNG-IUS and medical therapy is recommended for small fibroids.
- GnRH agonist can be used prior to surgery to reduce both uterine volume and size of fibroid, to correct anaemia or to reduce intra operative blood loss. Reduction in size may make a vaginal or laparoscopic hysterectomy more feasible however it makes myomectomy more difficult because of loss of tissue planes[18]. Myomectomy is generally not resorted to in this age group.
- Selective Progesterone Receptor Modulator :Ulipristal acetate 5-10mg once daily decreases the blood loss and also reduce the size of fibroid[19]. Side-effects includes headache, nasopharyngitis, abdominal pain and hot flushes. (GCPR-FOGSI Grade A ; Level 1)[8]
- Low dose Mifepristone 5 to 10 mg is also effective (GCPR-FOGSI Grade A ; Level 1)[8] but required strength is not available easily.

Management

In endometrial malignancy, standard protocol for management should be followed (GCPR-FOGSI Grade B; Level 4)[8]. In Endometrial hyperplasia without atypia, LNG-IUS is the first line therapy and oral progestins are alternative therapy. In endometrial hyperplasia with atypia hysterectomy is the standard treatment. (Grade B; Level 2)[8] Conservative treatment with high dose progestins should be considered in exceptional cases with histological monitoring.

AUB-C (Coagulopathy)

In patients with AUB-C, non hormonal therapy with tranexamic acid (1 gm qid) is the primary therapy. Hormonal treatment with COCs/ LNG-IUS is the secondary option in consultation with haematologist along with specific factor replacement and desmopressin. When surgical intervention is indicated, appropriate pre, intra, and post operative measures should be taken to minimise the blood loss. NSAIDs are contraindicated in coagulopathy.

AUB-O (Ovulatory Dysfunction)

- Cyclical luteal progestins (10-14 days) or LNG-IUS can be used as specific treatment in AUB-O.
- In acute episodes of bleeding, cyclical oral progestogens for 21 days can be used as short term management for 3 months. It is suggested to assess the response after one year of treatment and to decide accordingly to continue/discontinue the medications.
- Other drugs like tranexamic acid in dose of 1000mg -1300mg three times a day reduces bleeding significantly in women with AUB.
- NSAID like mefenamic acid and iboprufen relieves dysmenorrhea and heavy menstrual flow in perimenopausal AUB due to ovulatory disorder.
- Surgical intervention is recommended in failed medical management and persistence of symptoms.

AUB-E (ENDOMETRIAL)

- Management is similar to AUB-O (GCPR-FOGSI Grade A; Level 4)[8]

AUB-I (IATROGENIC)

- Supportive medical management should be given. Use of alternate drugs for drug induced abnormal bleeding and LNG-IUS when alternate drug is not available is the recommended treatment (GCPR-FOGSI Grade A; Level 1)[8]

AUB-N (NOT DEFINED)

- LNG-IUS is recommended first line therapy in women desiring contraception also.
- For AUB that is cyclic or predictable, non hormonal options like NSAIDs, Tranexamic acid are recommended. (GCPR-FOGSI Grade A; Level 1)[8]
- GnRH agonists with add back therapy is recommended for failed medical management.
- Uterine artery embolization is recommended for AV malformations and Hysterectomy should be considered as the last resort.

Recommendations for Heavy Menstrual Bleeding (HMB)

- Tranexamic acid has been used as first-line of treatment for HMB.
- Mefenamic acid as an NSAID reduces both pain and bleeding.
- LNG-IUS is effective in treatment of heavy menstrual bleeding[22]. Studies on women with fibroids have demonstrated relief of menstrual symptoms and a non-significant effect on volume. Spontaneous expulsion in case of fibroid uterus is 15.8%[23]

- Hysteroscopy and guided biopsy is recommended in women with heavy menstrual bleeding.(NICE 2018 guidelines)[24]
- Pelvic ultrasound should be advised along with proper counseling of patient explaining its limitations in the detection of uterine cavity lesions for which saline sonography is helpful.

Conclusion

AUB in peri-menopause is a commonly encountered clinical entity and it is important to systematically evaluate and manage it. Histopathological evaluation is mandatory to rule out premalignant and malignant pathology. In ovulatory dysfunction which is the most common cause of AUB medical management should be the first line of treatment. Surgical intervention should be reserved for failure of medical method, and in patients not suitable for medical management. Progestogens including LNG-IUS is preferred as it works like medical ablation with extra benefit of providing contraception.

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RECENT ADVANCES

Diagnosis & Management of Adenomyosis

J B Sharma[1], Tanudeep Kaur[2]

[1]Professsor, Department of Obgyn (AIIMS, New Delhi), [2](Fellow Urogynaecology, AIIMS, New Delhi)

Dr J B Sharma

Adenomyosis- A challenging benign gynecological condition! Due to the deficiency in standardisation of the definitions and diagnostic criteria, it's exact evidence and prevalence is arbitrary. It commonly coexists with endometriosis. It is a disorder in which endometrial stroma and glands are found within the uterine musculature (uterine adenomyomatosis). Hypertrophy and hyperplasia of the surrounding myometrium is induced, because of the ectopic endometrial tissue within, resulting in a diffusely enlarged uterus, termed as the globular enlargement. Making a diagnosis of adenomyosis is difficult, because of the limitation of a lack of full understanding of its epidemiology. Until recently, adenomyosis was diagnosed only at the time of hysterectomy, and was thought to be present only in parous women.

Confirmatory diagnosis of adenomyosis can only be made from the histopathological examination of the hysterectomy specimen.

Clinically pre-operative diagnosis can be made from the typical characteristics of heavy menstrual bleeding and dysmenorrhea in a uniformly enlarged uterus, after the endometriosis and fibroids have been ruled out.

2 -D TAUS - (Trans abdominal ultrasound scan) - increased uterine size without presence of fibroids with asymmetrical thickening of anterior and posterior walls of uterus, are the features seen on trans-abdominal scan, but image resolution of myometrium is poor with trans-abdominal scan, and hence cannot reliably diagnose adenomyosis or differentiate it from leiomyomas.

2-D TVUS - (Trans vaginal ultrasound scan) - first line investigation for diagnosis of adenomyosis. USG features of adenomyosis include presence of 3or more sonographic criteria:

a. Heterogeneity
b. Increased echogenicity
c. Decreased echogenicity
d. Anechoic lacunae or myometrium cysts

Adenomyoma in contrast with fibroids are more elliptical with poorly defined borders with no calcifications or edge shadowing. In doubtful cases, Doppler helps as blood vessels in adenomyoma usually follow their normal vertical course in the myometrial area while in case of fibroids, they are usually located in the periphery.

3-D USG – improves diagnostic accuracy, as it allows better imaging of JZ (junctional zone). JZ is often visible as a hypoechogenic subendometrial halo which is composed of longitudinal and circular closely packed smooth muscle fibres.

MRI- Gold standard imaging modality for assessing the JZ, in the evaluation of adenomyosis and for excluding malignant uterine neoplasia and for clearly distinguishing focal and diffuse adenomyosis from leiomyomatosis. The common features of adenomyosis on MRI include;

- Thickening of the JZ, JZ thickens ≥ 12mm or irregular junctional thickness with a difference of >5 mm between the maximum and minimum thickness.
- An ill-defined area of low signal intensity in the myometrium on >2 weighted MR images.
- Islands of ectopic endometrial tissue identified as punctate foci of high signal intensity on T1 weighted image.

In a review of 23 articles, the sensitivity and specificity of MRI for diagnosing adenomyosis was 77%-89%, in comparison to USG with a sensitivity of 72% & specificity of 81%.[1]

Shear Wave Elastography- using Aixplorer (Supersonic Imagine, France) scanner with application of shear wave elastography during TVS may improve diagnostic accuracy of adenomyosis.

HSG- seldom used to diagnose adenomyosis, but in patients undergoing infertility treatment, occasional findings of spiculations measuring 1-4 mm in length from endometrium towards myometrium or a uterus with 'Tuba- erecta' is suggestive of adenomyosis.

Hysteroscopy- appearance of irregular endometrium with endometrial defects or superficial openings, hyper- vascularization, strawberry pattern or cystic haemorrhagic lesions may be suggestive but not diagnostic of adenomyosis.

CT scan- has no role to play because of poor diagnostic accuracy for diagnosing adenomyosis.

Needle Biopsy- is of limited accuracy as its sensitivity is determined by the extent of the disease, no of biopsy specimens obtained, needle gauge and site used for sampling and above all, the experience of the operator[2].

Hysteroscopic Myometrial Biopsy- In 1992, a study by Mc Causland[2] proved that myometrial biopsy is helpful to diagnose adenomyosis., and that the depth of adenomyosis was correlated with the severity of menorrhagia. Hysteroscopic guided biopsy was strongly suggested by Gords et al[2] using a new device, the utero-spirotome.

Laparoscopic Myometrial Biopsy- Jeng et al[2] has reported a sensitivity of 98%, a specificity of 100% and a positive predictive value of 100% and a negative predictive value of 80%, which is superior to that of TVS,

CA125 or both. It is a valuable tool in diagnosis of diffuse adenomyosis in women with infertility, dysmenorrhoea and chronic pelvic pain.

Differential Diagnosis

- Pregnancy – is to be excluded in all women with AUB with enlarged uterus
- Endometriosis
- PID

Treatment

Guaranteed treatment is Hysterectomy.

Alternatives- for young women with extensive disease;

- **Progestins-** Women having adenomyosis have a decreased expression of progesterone receptors (A&B) in endometrial lesions, and in the inner and outer layers of myometrium. This decreased abnormal expression of progesterone receptors restricts the treatment of adenomyosis with progesterone.
- **Dienogest (progesterone**)- Directly inhibits cellular proliferation and induces apoptosis, but women are at a higher risk of discontinuation owing to the abnormal uterine bleeding.
- **Levonorgestrel Intrauterine System-(LNG IUS**)- has proven to be very promising in adenomyosis as it significantly decreases pain and heavy uterine bleeding which is due to the progestogenic effect of atrophy of eutopic endometrium. It controls the endometrial factors altered by adenomyosis, and decreases the expression of growth factors in women with heavy bleeding (Choi et al)[1].
- **Selective estrogen receptor modulators(SERMS**)- Tamoxifen or Raloxifene have limited value.
- **GnRH analogues** (goserelin 3.6 mg/month)and Aromatase inhibitors-reduce menorrhagia and dysmenorrhoea, as adenomyotic deposits like endometrial deposits are oestrogen dependent.
- **Combined OC pills**- have limited efficacy in adenomyosis.
- **Ullipristal Acetate** (UPA)- a potent selective progesterone receptor modulator, may be effective in adenomyosis, but robust literature is lacking.

Conservative Surgeries

- Endomyometrial ablation or resection with a new technique called H incision surgery- minimal adenomyosis should be definitely treated by ablation while deeper adenomyosis requires hysterectomy.
- Lap Myometrial Electrocoagulation
- Excision of Adenomyosis
- Radiofrequency Ablation (Transcervically) or with USG or via Laparoscopy

Combination of conservative Surgery followed by GnRH medical therapy has proven to be superior to surgery alone for control of symptoms. No benefit of uterine sparing surgery is seen in patients of 40 years or more.

Grimbiz et al[4] reviewed the current literature and has described 3 main categories of uterine sparing treatment;

- Complete excision by adenomyomectomy
- Cystectomy or partial excision cytoreductive surgery
- Non excisional techniques-
  Uterine artery ligation
  Electrocoagulation of myometrium
  Resection and ablation

After complete excision reduction in dysmenorrhoea-82%
Control of menorrhagia - 68.8%
Pregnancy rate- 60.5%

After partial excision reduction in dysmenorrhoea-81.8%
Control of menorrhagia - 50%
Pregnancy rate- 46.9%

Technique of excision of diffuse adenomyosis

Transverse H-incision Technique- it is a modified technique, mainly employed for anterior wall adenomyosis, ligation of uterine cervix throughout the broad ligament and use of vasoconstrictors to minimize the blood loss. An H-shaped incision is given over the anterior uterine wall and a 5 mm thickness of uterine serosa is resected from the uterine myometrium along the vertical incision., and the resection is extended, and the uterine serosa is opened wide bilaterally under the 'H'. Slices of adenomyotic tissue are removed using manual palpation to define borders of healthy myometrium.

Wedge Resection of the Uterine Wall-(open or laparoscopic), the part of the seromuscular layer with adenomyosis located is removed by wedge resection.

Assymetric Dissection of Uterus- uterus is dissected longitudinally with a surgical electric knife in an assymetrical fashion to divide the inside from the outside, preserving both the uterine cavity and bilateral uterine arteries, removing adenomyotic lesions to a thickness of 5 mm, using a loop electrode.

Laparoscopically assisted vaginal excision- A laparoscopic bilateral uterosacral ligament removal is performed, followed by a posterior colpotomy. The uterus is extracted via the vaginal incision, and under direct manipulation, adenomyotic fragments are removed with monopolar cautery after confirming it with touch and knotting manually with adequate tension.

Hysteroscopic Adenomyomectomy- It is possible when adenomyoma is < 5 cm or when it is protruding into the uterine cavity. It is always carried out under USG guidance. Aminimal safety margin of 5 mm should be maintained between the adenomyoma and the serosa to avoid perforation. Always pretreat with 3 months course of GnRH agonists to reduce vascularity and bleeding during surgery. Complete removal may be difficult and second sitting may be required.

Non Excisional Techniques- uterine sparing

- **Combination of excisional and non-excisional techniques** ie performing laparoscopic resection of diffuse adenomyosis after laparoscopic uterine artery occlusion.
- **Hysteroscopic non excisional techniques-** operative hysteroscopy, rollerball endometrial ablation, transcervical resection of endometrium, and endomyometrial resection.
- **Other techniques-** ablation of focal adenomyosis with HIFU(High Intensity Focussed Ultrasound),alcohol instillation under ultrasound guidance for the treatment of cystic adenomyosis, radiofrequency ablation of focal adenomyosis, microwave endometrial ablation and balloon thermoablation for diffuse adenomyosis.

UAE (Uterine artery embolization) – resolves symptoms in women successfully with significant decrease in uterine volume[1].

HIFU (High Intensity Focussed Ultrasound) - focusses the target lesion with high intensity ultrasound leading to coagulative necrosis and hence shrinkage of lesion. Both MRI & USG can guide the procedure, but MRI has better real time thermal mapping, and many studies have reported both symptom improvement and volume reduction[1].USG guided HIFU proves better due to real time imaging and being less costly and effective in both focal and diffuse lesions.

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Congratulations !!

Dr Anita Rajohria, Dr Rashmi Vyas and Dr Rohit Raina for correctly answering the quiz and crossword of December issue

* * * * *

Answer: December Issue

Crossword

Down: 2. ICSI, 4. AMH, 6. TESE, 9. Spiramycin, 10. OHSS

Across: 1. Zika, 3. Cabergoline, 5. HPV, 7. PPTCT, 8. Parvo

Pictorial Quiz

Figure 1: Ans 1. Microcephaly
Ans 2. Zika virus, rubella (German measles), chickenpox, toxoplasma and cytomegalovirus.

Figure 2: Ans 1. Intracytoplasmic sperm injection (ICSI)
Ans 2. Two previous fertilization failures with conventional IVF, use of epidiymal or testicular sperm samples, or when only acrosomeless or immotile spermatozoa are available

CASE APPROACH

Clinical Approach to Primary Amenorrhoea

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Dr Rashmi

Primary amenorrhea is defined as a failure to attain menarche by certain age. The estimated incidence is 0.1–0.3 per cent.[1] Evaluation is indicated when any of the following criteria are met:[2,3]

- Absence of menarche by age 15 years in the presence of normal secondary sexual characteristics (2.5 standard deviations (SD) above the mean of 13 years)
- Menarche has not occurred within three years of thelarche (breast development)
- Menarche has not started by age 14 years in the presence of hirsutism, excessive exercise or clinical suspicion of eating disorder or outflow tract obstruction
- No breast development by age 13 years (2.5 SD above the mean of 10 years)

To understand the causes of primary amenorrhoea, it is important to know how the puberty begins. At approximately 8 years the hypothalamus begins the pulsatile release of gonadotrophin releasing hormone (GnRH) leading to gonadotrophin secretion from the pituitary gland thus triggering puberty. Leptin, a protein produced by adipocytes, may act as a metabolic gate, allowing increased gonadotropin secretion when leptin levels are sufficient. Thus there is a correlation of minimal body fat for onset of puberty. Initially LH levels are increased during sleep. One year after this (9-11 years) thelarche starts, which is the first sign of puberty. This is followed by development of axillary & pubic hairs and growth spurt. Pubertal change typically occurs over a period of three yeas and can be measured using Tanner staging (Table 1). Menarche usually occurs during Tanner stage 4 of breast Development, and is rare before Tanner stage III development. By age 15 years 98% of girls would have had menarche.

There is a wide variation in the normal sequence of events which may be affected by body weight and nutrition. Recent studies suggest a trend towards earlier puberty possibly due to higher BMI scores. Compared with chronologic age, bone age estimates are correlated better with pubertal changes and offer a better reflection of normal physiologic development.[4]

Table 1: Tanner Staging of Puberty

Tanner Stage	Clinical Features
Stage 1 Pre- pubescent	No pubic hair No breast development Bone age younger than 11 years
Stage II	Minimal Pubic hair Breast buds Bone age younger than 11 years
Stage III Pubescent	Pubic hairs on mons Enlargement of breasts Axillary hairs Bone age 12-13 years
Stage IV	Adult pubic hair Areola enlargement Bone age 12-13 years
Stage V Post pubescent	As adult Bone age 13-14 years

Causes of Primary Amenorrhoea

A complex interaction between the hypothalamic-pituitary-ovarian axis and the outflow tract (uterus, cervix and vagina) is required for the normal menstrual bleeding to take place.

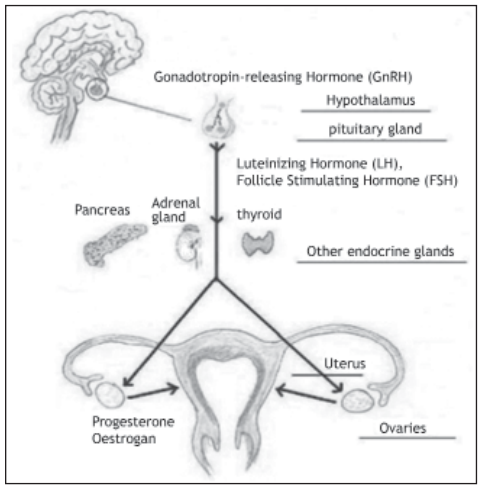

Figure 1: Normal Functioning Hypothalamo-Piuitary- Ovarian Axis

The following components are required for normal menstruation:

1. Normal female chromosomal pattern
2. Functioning hypothalamo-pituitary-ovarian axis
3. Responsive endometrium
4. Anatomical patency of the outflow tract
5. Active support from other endocrine glands such as thyroid and adrenals.

Any disruption in the above can result in amenorrhoea. An aetiological classification can be derived based on the defects in the following 4 compartments.

Compartment I- Disorders of the outflow tract (uterus and vagina)

Compartment II- Disorders of the ovary

Compartment III- Disorders of the anterior pituitary

Compartment IV- Disorders of the CNS.

Table 2: Causes of Primary Amenorrhoea

Organ	Cause
Hypothalamus	Weight Loass Intensive exercise Kallman's Syndrome Idiopathic
Pituitary	Hyperprolactinemia Hypopituitarism
Hypothalamic/ Pituitary damage	Tumours Cranial Radiation Head injury
Ovarian	Gonadal dysgenesis Primary Ovarian failure
Uterine	Mullerian agenesis Asherman's syndrome
Outflow tract	Imperforate hymen Transverse vaginal septum Cervical agenesis
Chromosomal	Turner's syndrome Androgen Insensitivity Syndrome
Systemic disorders	Chroic illness Weight loss Endocrine disorder
Delayed Puberty	Constitutional Delay

Overall it is estimated that endocrine disorders account for approximately 40% of the causes of primary amenorrhoea, the remaining 60% having developmental abnormalities.

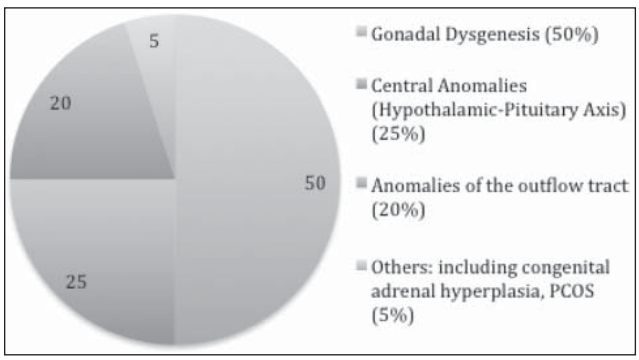

Fig 2: Causes of Primary Amenorrhoea

Approach to a Patient Presenting with Primary Amenorrhoea

Initial approach to these girls should be very sensitive giving due consideration to the emotional and psychological maturity of these cases. The history and examination should be done in the presence of a parent/ guardian. The emphasis should be on establishing a good rapport with the patient.

The aetiological diagnosis can be made with the help of these:

- History
- Physical examination
- Imaging studies
- Hormonal evaluation
- Karyotyping

History & Examination

A thorough history and a careful examination of stature and body form, secondary sexual development and external genitalia should always be carried out before any lab investigations.

History

History should focus on chronology of pubertal changes, eating and exercise patterns, weight change, chronic illness, medication use, sexual activity and symptoms of galactorrhea, thyroid dysfunction and androgen excess. Family history should include age at menarche and menopause, genetic disorders and developmental delay.

Clinical Examination

Physical examination includes assessment of habitus, breast development, hirsutism, stigmata of Turner's Syndrome, thyroid palpation and examination of genitalia. (Table 3 & 4) Assessment of external genitalia carried out in the outpatient department is restricted to inspection, especially in younger patients who are not sexually active. Sometimes if further examination of the lower genital tract is required, usually it is done under anaesthesia.

Table 3: Clinical Examination in Primary Amenorrhoea

General	Weight, height, BMI Skin (Evidence of androgen excess) Eyes: Visual field defects (present in large pituitary adenomas) Clinical thyroid status Dysmorphic signs (Arm span/upper segment and lower segment ratio, Features of Turner's syndrome) Pubic & axillary hair stages
Breast	Tanner staging Galactorrhoea
Systemic	CVS: abnormalities present in Turner's, rarely in Rockitansky syndrome Abdomen/ pelvis: presence of any lump groin nodes or hernia
External Genitalia	Clitoris size (Clitoral size > 35mm^2 means increased androgen effect, > 100mm^2 is evidence of virilization Any abnormality in position of anus, vagina & urethra Imperforate hymen or lower vaginal septum

Table 4: Common Physical Manifestations of Turner's Syndrome

- Short Stature
- Webbed Neck
- Low Set Ears
- Shield Chest
- Short fourth metacarpals
- Absent secondary sexual characters
- Primary amenorrhoea

Lab Evaluation

Further evaluations should begin with exclusion of pregnancy, regardless of the sexual history. It is important as ovulation may occur even before first menses.

Imaging studies

USG: A transabdominal ultrasound examination is initial investigation to know about internal genital organs in these girls. The features to be noted are presence/absence of uterus, any cryptomenorrhoea and presence/absence of normal ovaries. Transvaginal scan can be done if the girl is sexually active. If USG is inconclusive or further imaging is required in cases of mullerian anomalies, CT scan or preferably MRI can be done.

CT/MRI: CT/MRI scan of head is done in cases of Hypothalamic/pituitary cause.

Hormonal evaluation

A baseline assessment in all women should include measurement of serum prolactin and gonadotrophin concentration and an assessment of thyroid function.

Prolactin: Transient and moderate elevation of Prolactin levels may be due to various reasons including stress, drugs, breast examination etc. A more permanent, but still moderate elevation (greater than 700 iu/l) is associated with hypothyroidism and is also a finding in some women with polycystic ovary syndrome (PCOS). A serum prolactin concentration of greater than 1500 iu/l warrants further investigation with CT or MRI of the pituitary fossa to exclude a hypothalamic tumour, a nonfunctioning pituitary tumour compressing the hypothalamus (e.g. craniopharyngioma) or a prolactinoma.

Gonadotrophins: Serum gonadotrophin measurements help to distinguish between cases of hypothalamic or pituitary failure and gonadal failure. Normal FSH & LH values are between 5-20IU/L (eugonadotrophic).

Hypergonadotrophic Hypogonadism

Elevated gonadotrophin concentrations (FSH > 20IU/L, LH >40IU/L) indicate a failure of negative feedback as a result of primary ovarian failure (Compartment II defects). A serum FSH concentration of greater than 20 IU/l that is not associated with a preovulatory surge suggests ovarian failure. An elevated LH concentration, when associated with a raised FSH concentration, is indicative of ovarian failure. However, if LH is elevated alone (and is not attributable to the preovulatory LH surge) this suggests PCOS. Rarely, an elevated LH concentration in a phenotypic female may be due to androgen insensitivity syndrome

Hypogonadotrophic Hypogonadism

Failure at the level of the hypothalamus or pituitary (compartment III &IV defects) is reflected by abnormally low levels of serum gonadotrophin concentrations ((FSH and LH <5 IU/L and gives rise to hypogonadotrophic hypogonadism. It is difficult to distinguish between hypothalamic and pituitary aetiology, as both respond to stimulation with gonadotrophin-releasing hormone (GnRH). Further evaluation is done with CT or MRI in these cases.

Karyotyping: If the serum FSH is raised (Hypergonadotrophic hypogonadism) or the uterus absent then a serum karyotype is indicated. With a raised FSH the main diagnoses are premature ovarian failure (46, XX) or Turner syndrome (46, XO) or gonadal dysgenesis. If the uterus is absent then the likely diagnoses are androgen insensitivity syndrome (46, XY) or mullerian agenesis (46, XX). Karyotype results in these cases of primary amenorrhoea can be:

MRKH-46XX

Turner's-45XO

AIS-46XY

Gonadal dysgenesis-46XX, 46XY.

Step Wise Approach to making a Diagnosis in a Case of Primary Amenorrhoea

Rule out pregnancy in all cases by urinary pregnancy test

Serum TSH & Prolactin measurements and further management accordingly

Further on most important features to make diagnosis are*: Presence/Absence of breast development, Presence/Absence of uterus and FSH Levels*

Absence of secondary sexual characteristics

In the absence of secondary sexual characteristics including breast development and pubic hair the serum FSH level will be indicative of the underlying cause (Compartment II or Central Causes)

Compartment II (Disorders of Ovary)

Hypergonadotropic hypogonadism is characterized by gonadal dysfunction due to abnormal migration or rapid depletion of germ cells. Main features are high FSH, low E2 and abnormal pubertal development.

It includes

- Gonadal dysgenesis
- Pure gonadal dysgenesis (46, XX or 46, XY = Swyer syndrome)
- Mixed gonadal dysgenesis (mosaic 45,X0/46,XY etc.)
  Turner Syndrome (X0)
- Resistant ovary syndrome
- Premature ovarian failure
- Enzyme deficiencies: 17 α hydroxylase, aromatase

Turner syndrome

It is the most common cause of delayed puberty and primary amenorrhoea. It occurs 1 in 2500 to 1 in 3000

live born girls. Classic features of Turner syndrome are short stature, web neck, cubitus valgus, low hairline, shield chest and widely placed nipples. Associated cardiovascular abnormalities like coarctation of aorta and bicuspid aortic valves may be present. Renal abnormalities and auto immune hypothyroidism may also be associated.

Pure gonadal dysgenesis

These individuals will be phenotypic females with streak gonads and no chromosomal abnormalities.

Swyer syndrome is associated with a mutation in the SRY gene and as a result the testes are dysgenetic and do not produce testosterone or anti Mullerian factor. The Mullerian duct persists and the patient may have rudimentary uterus and vagina.

Mixed gonadal dysgenesis

Patients have streak gonad on one side and malformed testis on other side. They will have ambiguous genitalia. Mutation in SRY gene is considered as one of the aetiologies.

Resistant ovary syndrome

Resistant ovary syndrome (ROS) is a rare endocrine disorder characterized with hyper gonadotrophic hypogonadism, otherwise called Savage syndrome. They have normal female karyotype and female phenotype. There is increased plasma FSH level, but the ovary contains primordial follicles which are resistant to the action of gonadotropins.

Enzyme deficiencies

17 α hydroxylase deficiency and aromatase deficiency are associated with lack of sex steroids production resulting in delayed puberty. Individuals with 17 α hydroxylase deficiency have a karyotype of 46XX or 46XY. Uterus is absent with 46XY. Children with 17 α hydroxylase deficiency will also have hypernatremia, hypokalaemia and hypertension due to increased mineralocorticoid production. Hence, they will need corticosteroids in addition to oestrogen and progesterone. In aromatase deficiency increased level of androgens will be there. So female child will be virilised with ambiguous genitalia resulting in primary amenorrhoea. There is accelerated premature loss of primordial germ cells in developing gonads whilst in utero resulting in hypoplastic and dysfunctioning streak gonads.

Premature ovarian failure (POF)

POF may result from polyglandular autoimmune syndromes in conjunction with combinations of hypothyroidism, hyperparathyroidism, hypoadrenalism/ Addison's disease and type 1 diabetes. It is often quite

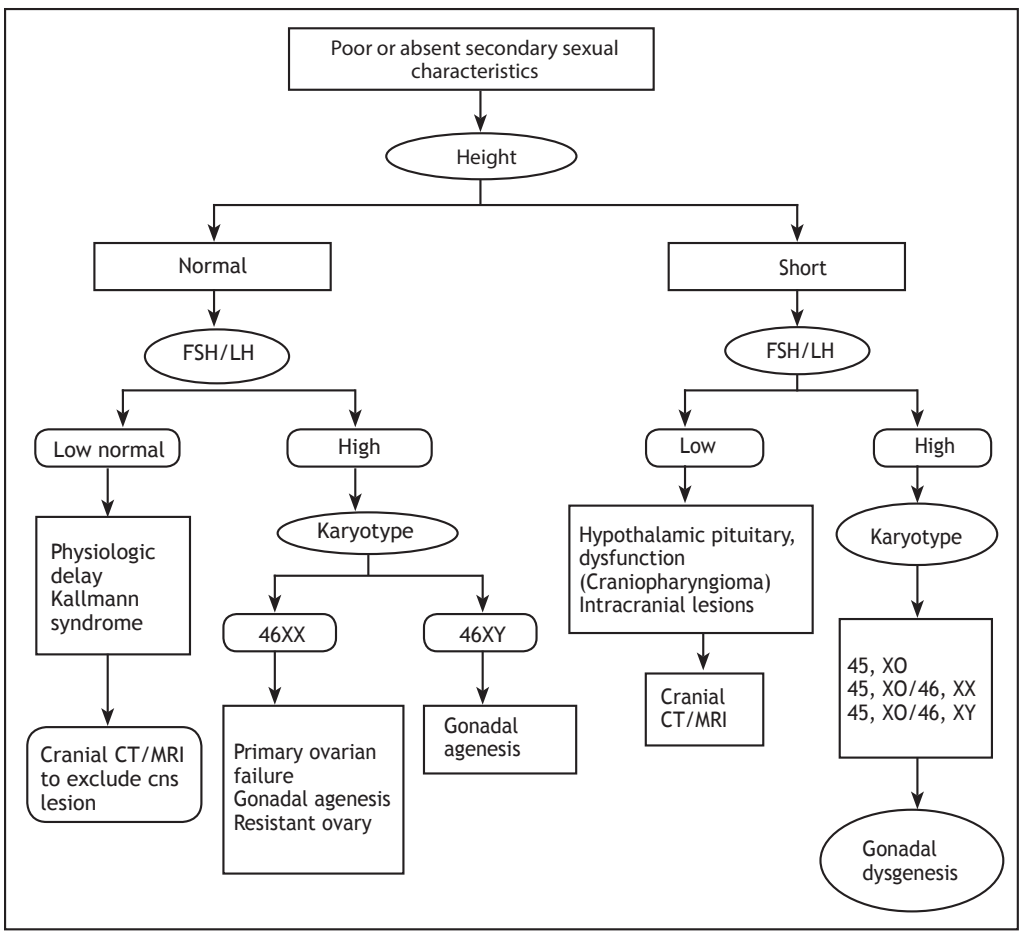

Fig 3: Clinical Evaluation in cases with Absent Secondary Sexual Characters

difficult to detect ovarian autoantibodies due to the poor sensitivity of available assays. Childhood cancers treatment with radiotherapy/ chemotherapy also causes ovarian failure. Fertility preservation should be considered in these cases before treatment.

Management of Compartment II Defects

Induction of puberty in adolescents with gonadal failure includes low-dose oestrogen from age 12 (oral or transdermal), with a gradual increase over 2–3 years. Oestrogen replacement therapy encourages normal sexual development and puberty. Cyclic progestogen is added upon completion of breast development, to avoid misshapen tubular breasts. Growth hormone is recommended in Turners' to help them achieve desired normal height. Adequate oestrogen-progestin replacement throughout the reproductive years is recommended to prevent osteoporosis, reduce risk of cardiovascular disease, normalise sexual function and reduce possible risk of cognitive impairment.[5] The data to support androgen replacement is limited.[6] Vit D & Calcium supplementation is also recommended for bone health. Gonadectomy is recommended in individuals with Y chromosome due to 20–30 per cent risk of malignancy. Psychosocial support and monitoring of bone health are important. Few women like Turner Mosaics, can become pregnant without fertility treatment very early in adulthood but for the majority fertility options are limited to the use of donor eggs/embryos in IVF.

Compartment III & IV Defects (Central Amenorrhoea):

- Constitutional delay
- Isolated gonadotropin deficiency
  - Kallman syndrome
- Structural lesion/tumor
  - Craniopharyngioma
- Chronic illness
- Functional hypothalamic amenorrhea:
  - Undernutrition
  - Anorexia/ Bulimia
  - Intense exercise
  - Stress
- Pituitary Causes
  - Prolactinomas

Pituitary Causes: Prolactinomas are easily excluded through measurement of serum prolactin levels and, if levels are raised>1500 mU/L, through MRI or CT imaging of the head. Hyperprolactinaemia causes hypogonadism through inhibition of GnRH release. If a micro or macro adenoma is diagnosed then endocrine review is indicated for subsequent management, usually involving dopamine-agonist treatment. Iatrogenic causes of hyperprolactinaemia include medications such as some anti-psychotics, domperidone and metoclopramide.

Kallman syndrome is rare (1:40 000-50 000 females) and associated with defects in olfactory bulb development. Genetic inheritance can be X-linked (KAL1), autosomal dominant (KAL2) or autosomal recessive (KAL3). Kallman syndrome is significantly more common in males (1:8000). Women with Kallman syndrome may have anosmia as well as amenorrhoea and low gonadotropins due to GnRH deficiency.

Other Organic causes

Other causes of hypogonadotropic hypogonadism include cranial tumours such as craniopharyngiomas, gliomas, germinomas, hamartomas and teratomas. They may cause additional symptoms such as headaches or other neurological sequelae and require neurosurgical treatment. Treatment for cranial tumours in childhood, including neurosurgery or cranial radiotherapy, may irreversibly damage hypothalamic-pituitary function and lead to primary amenorrhoea.

Functional Hypothalamic Amenorrhoea

Weight loss and anorexia are uncommon but important causes of primary amenorrhoea. The prevalence of anorexia nervosa in young women is 0.3-0.5% with the highest incidence in adolescent girls between 15 and 19 years. As described previously, there exists a link between weight and amenorrhoea. However, theories suggesting a critical percentage of body fat required for onset and maintenance of menses have been challenged. A diagnosis of anorexia clearly requires psychological and psychiatric input and management. Low body weight may also be due to high levels of exercise, which alone may also lead to reduced hypothalamic drive. More than 90% of adolescents and young adults with anorexia nervosa have reduction of bone mineral density at one or more points. The long term fracture risk is increased 2-3-fold compared to controls. Exercise-induced amenorrhoea is similarly associated with reduction in bone mass and increased fracture risk.

Chronic debilitating illness including malabsorption syndromes and renal or liver disease can also lead to hypogonadotropic hypogonadism. Chronic illnesses may affect nutritional, behavioural, hormonal and metabolic aspects and so cause amenorrhoea through a number of pathways.

Constitutional Delay

Whilst there are a number of possible causes of hypogonadotropic hypogonadism, constitutional delay is the most common factor. The diagnosis is suspected with positive family history, short stature, delayed secondary sexual characteristics and delayed epiphyseal maturation. Growth and development are appropriate for biologic age (skeletal age) rather

than for chronologic age and is determined from bone age radiographic studies of the left hand and wrist. The diagnosis is made by excluding other causes. The management is by watchful expectancy. The final height prognosis remains in the appropriate range for the parental centiles. Sometimes hormonal induction of puberty may be done in adolescents experiencing lot of distress due to delayed puberty.

Management of (Central) Hypogonadotrophic Hypogonadism

Ideally treatment is aimed at the underlying identified cause. Successful treatment of cranial tumours (including pituitary adenomas) may lead to resumption of pubertal development. Where relevant, an increase in weight or reduction in exercise may also lead to an improvement. If the hypogonadism is permanent (for instance after cranial surgery or radiotherapy) and puberty has not yet started then puberty needs to be induced using increasing doses of ethinyl-oestradiol. A suitable regime may be oral ethinyl-oestradiol 2 mcg daily, increasing by 5 mcg every 6 months to 20 mcg, then conversion to a combined oral contraceptive pill. It is important to optimize skeletal growth and uterine growth, for possible later pregnancy, by inducing puberty at the appropriate time and with the appropriate drug regimen. Puberty can also be induced when constitutional delay is thought to be the likely diagnosis. If hypogonadotropic hypogonadism persists then maintenance of sufficient oestradiol levels for optimal bone density, cardiovascular health, and to prevent numerous menopausal symptoms and complications can be achieved through use of a combined oral contraceptive pill or a combined HRT preparation. This can be continued until fertility is desired. At that point ovulation is induced using daily sub-cutaneous injections of gonadotropins for around 2 weeks followed by timed sexual intercourse. Cumulative pregnancy rates are high, in the region of 70%.

For pituitary causes (Prolactinomas) treatment is usually medical with Dopamine agonists (Bromocriptine or Cabergoline). For Macroprolactinomas causing pressure symptoms, surgery may be preferred.

Secondary Sexual Characteristics Present (Compartment I defects) (Fig 3)

The presence of secondary sexual characteristics implies the presence of functioning gonads and circulating oestrogen. Pelvic ultrasound, will demonstrate the absence or presence of a normal uterus.

Uterus absent or abnormal

If the uterus is absent or very small then the two main possible diagnoses are Mayer-Rokitansky-Kuster-Hauser syndrome (MRKH) and androgen insensitivity syndrome (AIS). The diagnosis is established with karyotyping differentiating between MRKH (mullerian agenesis) having 46, XX or androgen insensitivity syndrome having 46, XY karyotype. MRKH (1:4500 women) is a multifactorial genetic syndrome, featured by vaginal agenesis and uterine maldevelopment from a rudimentary to an absent uterus. Associated skeletal, renal and auditory anomalies are common. Diagnosis is possible with ultrasound or MRI. AIS (1:20,400 newborn males) is caused by end-organ insensitivity to androgens in genetic males with functioning testes. Both conditions share common clinical features; the differential diagnosis is made by karyotype. Management includes psychosocial counselling, creation of neovagina, removal of uterine remnants with active endometrium (MRKH) or gonadectomy due to risk of malignancy in undescended testes (AIS). Fertility interventions include surrogacy (MPKH) and surrogacy plus oocyte donation (AIS).

Uterus present

If secondary sexual characteristics are present and a uterus identified on imaging then an outflow tract obstruction due to an imperforate hymen or transverse vaginal septum is possible and requires exclusion. Functioning uterus with outflow obstruction will cause cryptomenorrhoea resulting in hematocolpos and/ or hematometra presenting as cyclical pain, urinary symptoms due to retention, abdominopelvic mass. Outflow obstructions are usually associated with urinary tract anomalies also and need evaluation.

The diagnosis is made on examination. Imperforate hymen is obvious clinically as bluish bulging membrane. Higher or thick vaginal septumsrot cervical agenesis may require further evaluation with MRI. Surgical resection is a definite treatment and fertility is not compromised.

Uterus Present & No Outflow tract Obstruction

The casues like PCOS or Asherman's though common causes of secondary amenorrhoea, very rarely may be seen in cases of primary amenorrhoea.

Constitutional delay is also a possibility

Table 5: Classification and incidence of PA cases (ASRM 2008)

Evaluation Findings	Causes
No breast development and low follicle-stimulating hormone (FSH) (30% of primary amenorrhoea cases)	Constitutional delay (10%) - Prolactinomas (5%) - Kallmann syndrome (2%) - Other central nervous system lesions (3%) - Stress, weight loss, and anorexia (3%) - PCOS (3%) - Congenital adrenal hyperplasia (3%) - Other reasons (1%)
No breast development: high FSH (40 % of PA cases)	-46 XX (15 %) - 46 XY (5 %) - Abnormal (20 %)
Breast development (30 % of PA)	-Mullerian agenesis (10 %) - Androgen insensitivity (9 %) - Vaginal septum (2 %) - Imperforate hymen (1 %) - Constitutional delay (8 %)

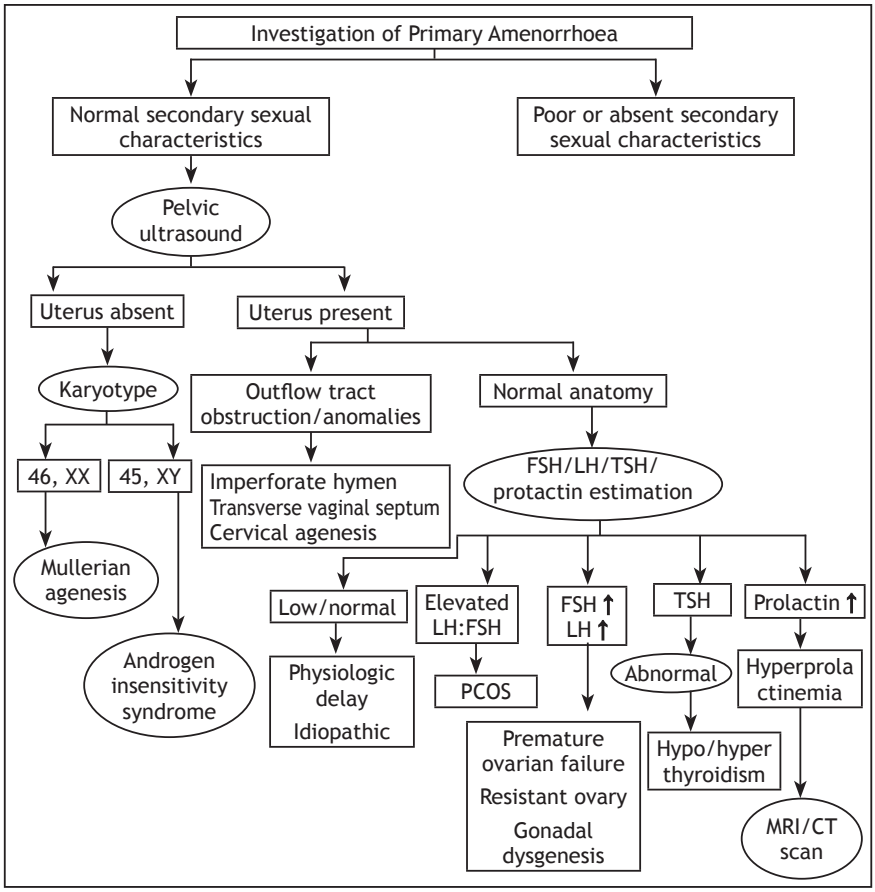

Fig 4: Evaluation in Primary Amenorrhoea with normal SSC

To conclude, each patient of primary amenorrhoea should be individually evaluated & treated, avoiding unnecessary tests and overtreatment. Pregnancy should always be excluded. Presence of secondary sexual characters, presence/ absence of uterus & FSH levels generally point towards the etiological possibilities (Table 5). In cases presenting with obstruction of the genital tract immediate surgery is advised. If hormonal treatment is required, aim is to develop secondary sexual characters, achieve optimal growth and subsequently long term hormonal treatment in cases of persistent hypogonadism. Explanation, reassurance, and emotional support are indispensable in management of these cases.

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Journal Scan

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Intravenous Carbetocin Versus Intravenous Oxytocin for Preventing Atonic Postpartum Hemorrhage after normal Vaginal Delivery in High-Risk Singleton Pregnancies: A triple-blind randomized controlled trial

Amornpetchakul P, Lertbunnaphong T, Boriboonhiransarn D, Leetheeragul J, Sirisomboon R, Jiraprasertwong R

Purpose

To compare the effectiveness of intravenous carbetocin to that of intravenous oxytocin for prevention of atonic postpartu m hemorrhage (PPH) after vaginal delivery in high-risk singleton pregnancies.

Methods

This triple-blind randomized controlled trial included singleton pregnant women who delivered at Siriraj Hospital between August 2016 and January 2017 and who were 20 years or older, had a gestational age of at least 34 weeks, had a vaginal delivery, and had at least one risk factor for atonic postpartum hemorrhage. Immediately after vaginal delivery, participants were randomly assigned to receive either 5 U of oxytocin or 100 mcg of carbetocin intravenously. Postpartum blood loss was measured objectively in mL using a postpartum drape with a calibrated bag.

Results

A total of 174 and 176 participants constituted the oxytocin and carbetocin groups, respectively. The baseline characteristics were comparable between the groups. The carbetocin group had less postpartum blood loss (146.7 ± 90.4 vs. 195.1 ± 146.2 mL; $p < 0.01$), a lower incidence of atonic PPH (0 vs. 6.3%; $p < 0.01$), less usage of additional uterotonic drugs (9.1 vs. 27.6%; $p < 0.01$), and a lower incidence of postpartum anemia (Hb ≤ 10 g/dL) (9.1 vs. 18.4%; $p < 0.05$) than the oxytocin group. No significant differences regarding side effects were evident between the groups.

Conclusions

Intravenous carbetocin is more effective than intravenous oxytocin for the prevention of atonic PPH among singleton pregnancies with at least one risk factor for PPH.

Editor's Comments

Carbetocin is a promising drug for management of PPH with the advantage that is long acting and more heat stable than oxytocin hence it is more suitable for use in India where maintenance of temperature is a problem.

Current Opinion in Obstetrics and Gynecology, 29(4),240-248.

New Paradigms in the Conservative Surgical and Interventional Management of Adenomyosis

Alvi FA, Glaser LM, Chaudhari A, Tsai S, Milad MP

Purpose of Review

Adenomyosis is commonly diagnosed in women of reproductive age. Interest in conservative interventions has grown as more women desire fertility preservation or avoidance of hysterectomy. This review discusses surgical and interventional methods for treatment of symptomatic adenomyosis. The technique, evidence, and utility of each method are described.

Recent Findings

Hysteroscopic ablative techniques are associated with lower morbidity than with hysterectomy but may result in an unacceptable risk of treatment failure. Surgical adenomyomectomy may provide good symptomatic improvement, especially when combined with preoperative gonadotropin-releasing hormone agonist treatment. Laparoscopic myometrial coagulation is associated with high rates of future pregnancy complications. Uterine artery ligation has limited value as an isolated approach but, coupled with other techniques, provides adequate therapeutic control. Bilateral uterine artery embolization may improve symptoms, without significantly compromising fertility. Focused ultrasonic surgical methods also show promise in alleviating symptoms without compromising reproductive outcomes

Summary

A multitude of surgical and interventional options are available for young women with symptomatic adenomyosis. These treatment methods have unique associated risks and benefits, and may have varying impacts on long-term symptom control, fertility, and reproductive outcomes.

Editor's Comments

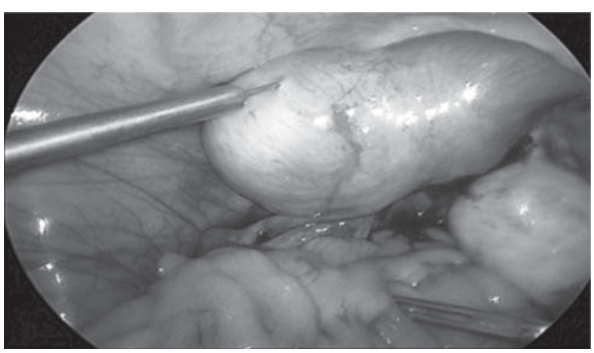
Adenomyosis is an enigma both in the diagnostic and management front. Medical management is preferable in the young women desirous of pregnancy but may not always be effective. Many different types of conservative surgical procedures have been described other then the traditional adenomyomectomy, but this requires expeience and good surgical hand. Intervention procedures like HIFU appears to have promising role.

Clinical Proceedings of AOGD Clinical Meeting held at Sir Gangaram Hospital, New Delhi on 27th December, 2018

Interesting Case of Accessory Cavitated and Uterine Masses (ACUM): Diagnostic dilemma

Shweta Mittal Gupta

26 year old patient, married since 3 months presented with severe dysmenorrhoe of 6 years refractory to medical management. She had reprot of an MRI suggesting unircornuate uterus with a noncommunicating functional rudimentary horn. 3 D USG was performed, which on the contrary suggested a normal uterine cavity with a lateral subserosal mass possibly an adenomyoma or a degenerating fibroid. Patient was counselled for a hysteroscopy and laparoscoy. On hystersoscopy uterine cavity was found to be noraml with both ostia visualized ruling out possibilty of a unicornuate uterus. On laparoscopy a serous mass seen on left side eccentrically placed above attachemt of round ligament. After injecting vasopressin and dissection, about 30-50 ml chocolate fluid was drained. A cavity was seen after evacation of the chocolate material On dye test both tubes showed tubal spill and no dye was seen coming through the evacuated cavity. Whole mass was excised and base sutured meticulously. Final histopathologhy suggested myometrial tissue lined by collection of hemosiderin laden macrophages as well as endometrial cuboidal lining and occasional endometrial cuboidal lining and occasional endometrial glands which was not in accordance with histopathological findings of adenomyoma. After literature search the final diagnosis made for this particular case was accessory cavitated uterine mass (ACUM). This is a new variety of mullerian developmental anomaly that is generally located at the level of insertion of round ligament and is possibly related to a dysfunction of the female gubernaculum In these women, the whole uterus develops normally by fusion of the two mullerian ducts into a single uterine cavity with both the fallopian tubes and ovarian ligaments arising from it, yet a cavitated mass present in one of the lateral sides of the uterus, lined by proper endometrium. Patients generally present with severe dysmenorrhoea right from menarche There is a paucity of data in the literature of such cases especially from the Indian perspective Knowledge and awareness of this entity will help to consider pre operative diagnosis of ACUM. Treatment is surgical removal of the mass laparoscopically which helps to overcome such distressing symptom in these patients.



Pic: Laparoscopic view of ACUM

A Rare Case of Utero-cutaneous Fistula Following Caesarean Section

Chandra Mansukhani, K Gujral, Pallavi Sharma

We present a rare case of Utero-cutaneous fistula following caesarean section which was successfully managed laproscopically. Patient was 30 yr old female with P2L2 with 2 previous LSCS presented with blood stained discharge from right angle of the caesarean scar. Diagnosis was confirmed as Utero-cutaneous fistula on MRI. Because of the rarity of this condition, No definitive evidence based treatment modality has been reported in the literature. The couple was counseled regarding the laparoscopic/ open method for repair and consent for same was taken.

On diagnostic laparoscopy – Uterus was densely adherent to anterior abdominal wall, adhesiolysis was done. Fistulous tract was identified by putting methylene blue with the help of feeding tube from skin opening and from cervix putting the Rubin's cannula, jet of the methylene blue from anterior abdominal wall and uterus confirmed the fistulous tract; it was excised. The uterine defect was repaired in two-layers and live omental graft was placed and stitched over the uterine defect and the procedure was completed laproscopically. Residual fistulous tract in subcutaneous fat was excised till the level of sheath and wound was left open to heal by secondary intention.

The Patient was discharged on 2nd Post-op day. HPE showed inflammatory tract with scar endometriosis, hence injection of GnRH (3.75mg) was given. She resumed her normal periods after 2 months of surgery and there was no discharge from the scar.

Utero- cutaneous fistula is a rare entity only 25 cases have been reported in the last 50 years & not more than 3-4 cases from India. Almost all the cases in the literature were managed by laprotomy followed by hysterectomy, medical management followed by repair

of fistula by open method and laparoscopic adhesiolysis followed by laprotomy.

We presented this case, because not a single case of Utero-cuatenous fistula has been reported in the literature which was managed laproscopically.

Laparoscopic Management of Tubo-Ovarian Abscess

Punita Bhardwaj

Untreated PID leads to tubo-ovarian abscess. This condition has high morbidity. Most common cause is ascending upper genital tract infection. 60% of such cases are nulliparous.

Diagnosis is made by history, examination, raised markers for inflammation and radiological structures with a mass. Tumor marker CA-125 was raised in few but this is a non-specific marker.

25% require surgical treatment but time and extent of procedure may vary.

Long term complications are subfertility, ectopic pregnancy, chronic pelvic pain.

PID is polymicrobial in 30-40% of cases.

Management:

- If the patient is stable then initial treatment is with antibiotics. Effective in 70% of cases but has high recurrence.
- Broad spectrum triple antibiotic regimen is quite effective.
- CDC guidelines are followed for antibiotic regimen and duration.
- More complex cases are handled with a multi-disciplinary approach with radiologists, microbiologists and anaesthetists.

Short summary of the cases presented:

CASE a: Unmarried girl, running fever with bilateral tubo-ovarian masses not responding to prolonged antibiotics. Patient was investigated and posted for conservative surgery.

She underwent laparoscopic adhesiolysis with bilateral endometrioma with pus drainage with ovarian cystectomy. Pelvic drain was kept. Pus was sent for culture. Post surgery triple antibiotic was given.

CASE b: Unmarried girl with fever and bilateral pelvic mass was investigated and posted for laparoscopy as she was not responding to antibiotics.

She underwent laparoscopic adhesiolysis with deroofing of mass and drainage of pus and biopsy from the ovarian mass. Koch's work up was done. Pelvic drain was placed.

She tested positive for Koch's and was put on ATT for 9 months to which she responded positively.

CASE c: The patient was a case of Previous 2 LSCS recurrent pelvic abscess persistent tubo-ovarian mass, running high grade fever not responding to antibiotics, antipyretics post surgery (second)

She had past history of-

Operation one: laparoscopic appendicectomy with left ovarian cystectomy by a surgeon 3 months back

Operation two: Laparoscopic ovarian cystectomy by a gynaecologist 6 weeks back. She was investigated with CT indicating large phlegmon on the left.

She underwent laparoscopic adhesiolysis with left Salpingo-opherectomy. Her pus culture grew E. Coli. Prolonged injectable followed by oral antibiotics were given according to CDC guidelines.

She recovered.

CASEd: This patient was a 40 yr old with late marriage with infertility with uncontrolled DM with bilateral adnexal masses running high grade fever not responding to antibiotics. She was investigated in detail and posted for surgery.

On laparoscopy she was found to have localised bilateral pyosalpinx. Decision of bilateral salpingectomy was taken on the table in consultation with the patient's relative considering the condition of the tube.

The uterus was left in view of fertility issues.

The histopathology was Female adnexal tumor of probable wolffian origin **(FATWO)**

A very rare benign tumor with possibility of malignancy.

Only 90 cases have been reported in literature. Because of limited literature no recommendations are there regarding the pre-operative work up and treatment.

This patient underwent post-operative counselling for further management. She opted for clearance surgery of removal of uterus with bilateral ovaries.

Series of Challenging Cases of Fibroids Managed Laparoscopically

Kanika Jain, Debasis Dutta, Kanika Chopra

Fibroids in difficult locations like central cervical fibroids, pseudo broad ligament fibroids and lower segment fibroids are difficult to manage technically owing to their position in depths of pelvis, the anatomical distortion caused by them, their proximity to vital structures i.e. bladder, ureter and bowel and hence difficult endosuturing especially the obliteration of the dead space to ensure hemostasis. Series of videos were presented for three cases of laparoscopic myomectomy for central cervical fibroid in case 1 in which unmarried 28-year-old, patient presented with lump abdomen and menorhhagia. P/V examination was suggestive of a completely effaced cervix with mass felt

corresponding to 12-14 week size gravid uterus. Case 2 was a, 28-year-old patient having menorrhagia and was found to have large right lateral cervical fibroid becoming pseudobroad ligament of 14x 10 cm. Case 3 was of a 31-year-old infertile woman who was found to have a large lower uterine fibroid of 12x10cm, placed posteriorly during course of sonographic examination. So, in all the in brief detailing the main surgical steps which included; initial panaromic view of the fibroid and their relationship with adjacent vital structures. Diluted vasopressin in 1: 10 dilution was instilled in all the cases to decrease blood loss and ensure effective aqua dissection as well. Incision were planned accordingly to the location of the fibroid and then enucleation of the fibroid followed traction and countertraction mechanism, remaining within the capsule and keeping an energy source below the dissecting fibroid to ensure that small capillaries were secured that may retract leading to bleeding later are managed simultaneously. Endosuturing then followed with barbed sutures/ interrupted stitches with vicryl number 1, obliterating the depth by holding the bed with blunt grasper so that no blind sutures are vital structures were not included and compromised in this procedure. At the end of completion of surgery, hemostasis was ensured, integrity of all surrounding vital structures ensured and a pelvic drain put. In our experience, due to better clarity of vision, with both panoramic and zoom-in view possible, consequent upon enhanced light effect, these tumors can be optimally managed by minimally invasive route. These cases were safely and successfully managed with a favourable outcome in terms of blood loss, postoperative morbidity, decreased hospital stay and patient comfort.

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