

STANDARD TREATMENT GUIDELINES OBSTETRICS & GYNAECOLOGY

**Ministry of Health & Family Welfare
Govt. of India**

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LEIOMYOMA UTERUS/FIBROMYOMA/FIBROID UTERUS

I.INTRODUCTION AND CASE DEFINITION:

Leiomyoma of uterus also called as fibromyoma or fibroid uterus is a benign tumor of uterus, essentially composed of smooth muscle tissue and a variable amount of fibrous connective tissue. It is the most common tumor of uterus , and is found in 20% of women in reproductive age group.¹

Leiomyomas are the reason behind one-third of all hospital admissions to gynecology services and one of the commonest indications for hysterectomy.²

Fibroid Uterus is more common among older nulliparous and obese women, particularly the ones with family history of this disease. Based on the location of tumor in the uterus, various types of myoma are-subserous, intramural and submucous fibroids.

II.INCIDENCE OF FIBROID IN INDIA

Nearly 20-30% women in reproductive age group have fibroid uterus. At any given time, nearly 15-25 million Indian women have fibroid uterus.

III.DIFFERENTIAL DIAGNOSIS

- Adenomyosis
- Bicornuate uterus
- Ovarian tumor
- Retroperitoneal connective tissue tumor
- Calcified tuberous pyosalpinx

Complications:

- Torsion of pedunculated subserous fibroid
- Infection of submucous myoma
- Ascites may be caused rarely by pedunculated subserous fibroid
- Intraperitoneal hemorrhage from rupture of a large vein on the surface of myoma (rare)
- Malignant change in 0.2% of uterine fibroids
- Degeneration (Hyaline/Cystic/Fatty/Red degeneration)

- Pregnancy complications like spontaneous abortion, preterm delivery, abruption-placentae
- Labor complications: Inertia, Dystocia, PPH

Pelvic pathologies commonly co-existent with fibroid uterus

- Endometrial hyperplasia and endometrial polyps
- Endometriosis
- Anovulation and dysfunctional uterine bleeding
- Pelvic inflammatory disease
- Tubal pregnancy

IV. OPTIMAL DIAGNOSTIC CRITERIA, INVESTIGATIONS, TREATMENT & REFERRAL CRITERIA

Situation 1: At Secondary Hospital/ Non-Metro situation: Optimal Standards of Treatment in Situations where technology and resources are limited

a). Clinical diagnosis:

History

- Most leiomyomas are asymptomatic and are diagnosed incidentally
- Bleeding-Menorrhagia, Meno-metrorrhagia
 - Continuous/irregular bleeding and blood-tinged discharge per vaginum may occur in cases of surface ulceration of submucosal fibroid polyp.
- Pressure symptoms-Pelvic discomfort or feeling of heaviness in pelvis
 - Acute urinary retention
 - Urgency or frequency of micturition
 - Rarely dyspepsia or constipation
- Pain –Dysmenorrhoea
 - Lower abdominal and pelvic pain: Not a common symptom but may occur in cases of fibroid polyp/ torsion of pedicle of subserous pedunculated fibroid/ degeneration of fibroid/ sarcomatous change in fibroid
- Infertility

- Pregnancy complications-Increase in size with red degeneration, abortions, preterm labor, malpresentations
- Labor complications-Inertia, Dystocia, PPH

Examination

- General physical examination-Pallor may be present in cases of anemia due to menorrhagia.
- Abdominal examination may reveal a firm, non-tender, rounded/lobulated mass with side to side mobility and which is dull to percuss. (Only in cases of huge fibroids)
- *P/S exam*- Submucosal fibroid polyp may be seen coming out of the cervix into the vagina .with ulceration of surface of mass,seen as white discharge or bleeding.
- *P/V*-Bimanual pelvic examination reveals an enlarged irregular firm uterus, but it may be symmetrically enlarged in cases of intramural and submucous fibroid. Subserous fibroid may be felt attached to the uterus or it may be felt as irregularity on one side or as an adnexal mass in case it is pedunculated or broad ligament fibroid. Submucosal fibroid polyp may be seen/ felt coming out of the cervix into the vagina.D/D with inversion ut

b) Investigations

- CBC
- Blood grouping and Rh
- Urine routine and microscopy
- Ultrasonography
- Pap smear
- Endometrial biopsy when diagnosis is in doubt

c) Treatment

Treatment modality should be individualized to each patient after considering patient's age, severity of symptoms, need for fertility preservation, presence of other gynecological diseases and any other co-morbidity.

- Small Leiomyomas discovered incidentally and not associated with any complications usually do not require any treatment. Performing hysterectomy for an asymptomatic fibroid for the sole purpose of alleviating the concern that it may be malignant is not warranted. Such patients should be explained, reassured and called for examination at periodic intervals.

Asymptomatic fibroid may warrant treatment in following situations:

- The size of fibroid uterus is more than 12-14 weeks pregnant uterus
- Rapidly growing fibroid
- Evidence of hydroureter / hydronephrosis resulting because of compression of ureters by the tumor.
- Subserous pedunculated fibroids are liable to undergo torsion of pedicle and hence may be treated even if asymptomatic.
- General measures: Correction of anemia with hematinics (iron & folic acid). Severe anemics with ongoing blood loss may require packed cell transfusion. Reducing blood loss during periods.
- **Medical management:**

This should be tailored to suit the needs of the woman. However, the costs & side effects of different drugs may limit their long term use.

Gonadotropin-releasing hormone agonists may be given pre-operatively in order to reduce blood loss and operating time prior to hysterectomy, myomectomy or myolysis.

Indications of GnRH agonists administration:

- A) Preoperatively to shrink fibroids and to reduce menstrual related anemia
- B) Short term alternative to surgery in perimenopausal females.
- C) Tab / Inj)tranexamic acid may reduce menorrhagia associated with fibroids
- D) Tab danazol has been associated with reduction in volume of fibroid by 20 -25%. Although long term response to danazol is poor ,it may offer an advantage in reducing menorrhagia

Disadvantages of giving GnRH agonists

- E) High cost
- F) Side effects like hot flashes & vaginal dryness
- G) Risk of development of osteoporosis if given for more than 6 months.
- H) Higher risk of recurrence of fibroids after myomectomy if GnRH analogues have been given pre-operatively.

Some other drugs that can be employed along with their indications & side effects are enlisted below:

Treatment	Indications & Potential unwanted outcomes experienced by some women (Common: 1 in 100 chance; less common: 1 in 1000 chance; rare: 1 in 10,000 chance; very rare: 1 in 100,000 chance)
Levonorgestrel-releasing intrauterine system	<p>Small fibroids not distorting the uterine cavity</p> <p>Common: irregular bleeding that may last for over 6 months; hormone-related problems such as breast tenderness, acne or headaches, which, if present, are generally minor and transient</p> <p>Less common: amenorrhoea</p> <p>Rare: uterine perforation at the time of insertion</p>
Tranexamic acid	<p>Menorrhagia</p> <p>Less common: indigestion; diarrhoea; headaches</p>
Non-steroidal anti-inflammatory drugs	<p>Menorrhagia & dysmenorrhea</p> <p>Common: indigestion; diarrhoea</p> <p>Rare: worsening of asthma in sensitive individuals; peptic ulcers with possible bleeding and peritonitis</p>
Oral progestogen (norethisterone)	<p>Size reduction</p> <p>Common: weight gain; bloating; breast tenderness; headaches; acne (but all are usually minor and transient)</p> <p>Rare: depression</p>
Injected progestogen	<p>Size reduction</p> <p>Common: weight gain; irregular bleeding; amenorrhoea; premenstrual-like syndrome (including bloating, fluid retention, breast tenderness)</p> <p>Less common: small loss of bone mineral density, largely recovered when treatment discontinued</p>

Though many gynaecologists are using danazol & mifepristone to reduce the size of the fibroids with good results, there is no definite consensus on their use & further trials are necessary to clearly define their roles.

- **Surgical treatment**

-**Hysterectomy** is the surgical removal of uterus which may be done abdominally/ vaginally or laparoscopically based on the size of uterus, mobility and descent of uterus, patient's desire and presence of other gynecological diseases and other co-morbidities. In women who don't wish to preserve uterus/ fertility, hysterectomy is a definitive treatment. Disadvantages of hysterectomy are the surgical and anaesthetic risks involved in the same.

-Myomectomy is the surgical removal of myomas while uterus is being preserved. This may be done abdominally/ vaginally/laparoscopically or hysteroscopically, depending on the site and size of myomas. The merit of myomectomy lies in preservation of fertility but the disadvantage is risk of recurrence of fibroids, which may require a repeat surgery. Myomectomy is usually preferred in patients less than 40 years of age, who wish to preserve their menstrual and reproductive functions. Vaginal myomectomy is suitable for patients with submucous pedunculated fibroid projecting into vagina.

d). Referral criteria

- Patients desirous of fertility & have fibroids that distort the uterine cavity where no other factors have been identified can be managed by laparoscopic / hysteroscopic myomectomy & should be referred to a super specialty hospital, in case facilities for the same are not available in situation1.
- Pregnant women may require additional fetal surveillance when the placenta is implanted over or in close proximity to a fibroid.
- In case laparoscopic hysterectomy is planned and adequate facilities / equipment / skilled laparoscopic surgeon / anaesthetist are not available, patient should be referred to a super specialty hospital in a metro location.
- Patients suitable for uterine artery embolization procedure/myolysis
- Presence of co-morbidities like cardiac diseases, pulmonary diseases etc.
- HRT may be given if indicated in postmenopausal women. Although it causes myoma growth in postmenopausal women, it does not appear to cause clinical symptoms. Postmenopausal bleeding and pain in women with fibroid should be investigated in the same way as in women without fibroids.

Situation 2: At Super Specialty Facility in Metro location where higher-end technology is available

a) Clinical diagnosis- Same as situation1

b) Investigations

-CBC

-Blood grouping

-Urine routine and microscopy

- Ultrasonography (Transabdominal & transvaginal)

-Sono hysterography /Hysteroscopy

- Pap smear

- Endometrial biopsy where indicated.
- Magnetic resonance imaging (if needed)

c) Treatment

Treatment modality should be individualized to each patient after considering patient's age, severity of symptoms, need for fertility preservation, presence of other gynecological diseases and any other co-morbidity. Management of asymptomatic fibroids, general measures and medical management as already mentioned in situation1.

- **Surgical treatment** options are as already mentioned in situation1.Laparoscopic hysterectomy or laparoscopic myomectomy can be offered in case where patient does not have any cardiac or respiratory disorders which contradict the same. Very large tumors may limit the suitability of the case for laparoscopic management. Subserous pedunculated fibroids are usually good candidates for laparoscopic myomectomy. Hysteroscopic myomectomy can be done for symptomatic submucosal fibroids.

-Laparoscopic Myolysis or myoma coagulation is usually done with Nd:YAG lasers or bipolar needles. This results in necrosis and shrinkage of myoma. It may be combined with endometrial ablation to reduce bleeding. Women may be candidates for myolysis if they have fewer than four myomas of ≤ 5 cm or if their largest myoma measures less than 10 cm in diameter.Laproscopic myolysis may present an alternative to myomectomy or hysterectomy for selected women with symptomatic intramural or subserous fibroids who wish to preserve their uterus but do not desire future fertility(sogc level II b)

- **Non-surgical treatment:**

-Uterine artery embolization is an interventional radiologic procedure to occlude uterine arteries and hence relieves menorrhagia in more than 90% of patients. In this procedure, a micro-catheter is introduced into the uterine artery via femoral approach and usually polyvinyl alcohol foam particles are used to occlude uterine arteries. This results in infarction of myomas. It has the advantage of being a minimally invasive procedure, avoids surgery and entails a shorter duration of hospital stay. Its role in preservation of fertility is yet undetermined pending long term studies. The disadvantage is risk of symptom recurrence in nearly 17% cases.

Magnetic-resonance-guided focused ultrasound surgery:

Magnetic-resonance-guided focused ultrasound surgery (MRgFUS) is a non-invasive thermo-ablative technique that uses focused high-energy ultrasound to ablate fibroid tissue. As in conventional diagnostic ultrasound, the ultrasound waves pass through the anterior abdominal wall. Significant heating only occurs where the waves converge at the focus. Magnetic resonance guidance provides continuous imaging of the fibroid and other vital structures such as bowel, bladder and sacral nerves.

Significant improvement in quality-of-life parameters has been reported in women undergoing MRgFUS. Given considerable symptoms at enrolment and a large decrease

in mean symptom levels, this appears to be a clinically significant result. The volume reduction after treatment is small compared with the mean levels seen after both myomectomy and uterine artery embolization (UAE). MRgFUS appears to be a safe intervention for uterine fibroids.

Furthermore, women who have treatment with MRgFUS do not appear to develop symptoms similar to the postembolization syndrome symptoms associated with UAE.

However, the true place of MRgFUS is yet to be established in comparison with the other available treatment modalities by way of randomized controlled clinical trials³.

References

1. Pratap Kumar, Narendra Malhotra. Jeffcoate's Principles of gynecology. 7th ed. Jaypee publishing; 2008
2. Rock, John A.; Jones, Howard W. III. Te Linde's Operative Gynecology. 10th ed. Lippincott Williams & Wilkins (LWW); 2008
3. Best Practice & Research Clinical Obstetrics and Gynaecology Vol. 22, No. 4, pp. 735–747, 2008
4. SOGC Clinical Practice Guidelines;2003
5. NICE Clinical Guidelines44;2007

ANTE PARTUM HAEMORRHAGE

Definition:

APH is defined as bleeding from or into the genital tract occurring from 24th week of pregnancy and prior to the birth of the baby.

Why it occurs?

The causes of APH include placenta previa, abruption placenta, local causes and unexplained causes. Local causes comprise vasa previa and cervical or vaginal causes.

Commonly it is due to:

- Placenta previa
- Abruptio placenta

It may also be due to:

- Exaggerated show,
- Trauma to cervix or vagina
- Cervical ectropion,
- Carcinoma of cervix or polyps
- Vasa previa

How to diagnose Placenta Previa?

Definition:

The term *placenta previa* refers to a placenta that overlies or is proximate to the internal os of the cervix. The placenta normally implants in the upper uterine segment. In placenta previa, the placenta either totally or partially lies within the lower uterine segment.

Incidence: 1 in 300 pregnancies

Maternal morbidity and mortality is high if it is not treated properly.

Perinatal morbidity and mortality also are primarily related to the complications of placenta previa, because the hemorrhage is maternal.

Predisposing factors:

- Advancing maternal age
- Multiparity

- Multifetal gestations
- Prior caesarean delivery
- Prior placenta previa

Differential Diagnosis:

Abruption placentae, other probable causes.

Optimal Diagnostic Criteria, investigations, treatment and referral criteria:

Situation 1: At Secondary Hospital/ Non-Metro situation:

(Optimal Standards of Treatment in Situations where technology and resources are limited)-

a) Clinical Diagnosis:

It is on the basis of history, physical examination and investigations.

- History: Nature of bleeding: Painless, recurrent, bright red. Initial bleeding may not be profuse enough to cause death; **but** it is a warning sign and requires close monitoring or refer the patient to higher centre.
- On physical examination: Patient might be in shock
 - . Abdominal examination: Height of uterus proportionate to gestational age, presenting part may be felt high up (not engaged).
 - . Malpresentations, malpositions usually present.
 - . Uterine contraction may or may not be present. Some degree of uterine irritability is present in about 20% of the cases.
 - . Fetal heart sound may or may not be present, depending upon the amount of blood loss.

If you suspect placenta previa, do not perform a vaginal examination without preparation. Per vaginal examination should be done in theatre but without any anesthesia with all preparations of immediate cesarean section.

b) Investigations:

- Blood investigations (Full blood count, blood group and type)

② **Ultrasound examination:** Rules out types of placenta previa; fetal anomalies, fetal parameters, presentation and position.

③ **Transabdominal ultrasonography (TAS):**

- It should be with partially full bladder.
- It is a simple, precise, and safe method to visualize the placenta.
- TAS has an accuracy of 93-98%.
- Four types of placenta praevia according to abdominal sonography

Type I- Dips in to lower segment

Type II - Reaches lower border of uterus up to cervical os but not covering completely.

Type III- covers the internal os

Type IV - Covers the internal os, even on full dilatation of the cervix.

At 18 weeks, 5-10% of placentas are low lying. Most 'migrate' with development of the lower uterine segment.

- False-positive results can occur secondary to focal uterine contractions or bladder distention.

④ **Transvaginal ultrasonography (TVS):**

Recent studies have shown that the transvaginal method is safer and more accurate than the transabdominal method. Transvaginal ultrasonography is also considered more accurate than transabdominal ultrasonography.

- ó Skilled person should only do.
- ó The os-placental edge distance on TVS after 35 weeks' gestation is valuable in planning route of delivery. When the placental edge lies > 20 mm away from the internal cervical os, women can be offered a trial of labour with a high expectation of success. A distance of 20 to 0 mm away from the os is associated with a higher CS rate, although vaginal delivery is still possible depending on the clinical circumstances.
- ó In general, any degree of overlap (> 0 mm) after 35 weeks is an indication for Caesarean section as the route of delivery

c) **Treatment :**

- Assess the blood loss
- Resuscitate:

- Monitor BP
- Start IV Line
- Restore blood volume by infusing normal saline
- Explain the need of blood transfusion
- Arrangements made to shift to higher centres.

d) Referral criteria:

Shift to hospitals where blood bank, neonatal and emergency cesarean section facilities are available.

Situation 2:

(At Super Specialty Facility in Metro location where higher-end technology is available)

a) Clinical diagnosis:

Diagnosis reached by history, physical examination and sonographic examination

After initial assessment further investigations need to be performed to ascertain cause , degree of bleeding, plan the on-going care and to decide mode and time of delivery.

b) Investigations: As above.

- Blood investigations (Full blood count, blood group and type)
- Ultrasound examination : Best investigative tool to diagnose placenta previa.
Rule out all Four types of placenta previa:
 - Type I- Dips in to lower segment
 - Type II - Reaches lower border of uterus up to cervical os but not covering completely.
 - Type III- covers the internal os
 - Type IV - Covers the internal os, even on full dilatation of the cervix.
- At 18 weeks, 5-10% of placentae are low lying. Most 'migrate' with

development of the lower uterine segment.

- MRI: MRI has been suggested as a safe and alternate method and may be useful in determining the presences of placenta accreta/increta/percreta.

c) Treatment:

- NO VAGINAL EXAMINATION
- Resuscitate:
- Monitor BP
- Assess the amount of bleeding.
- Start IV line
- Restore blood volume by blood products

The definitive treatment depends upon the duration of pregnancy, fetal and maternal status and extent of hemorrhage:

- Type I and Type II anterior - vaginal delivery can be expected. Trial of vaginal delivery can be given and caesarean is done if patient bleeds
- Type II -b, III & IV - Elective/emergency caesarean section has to be done at the earliest.

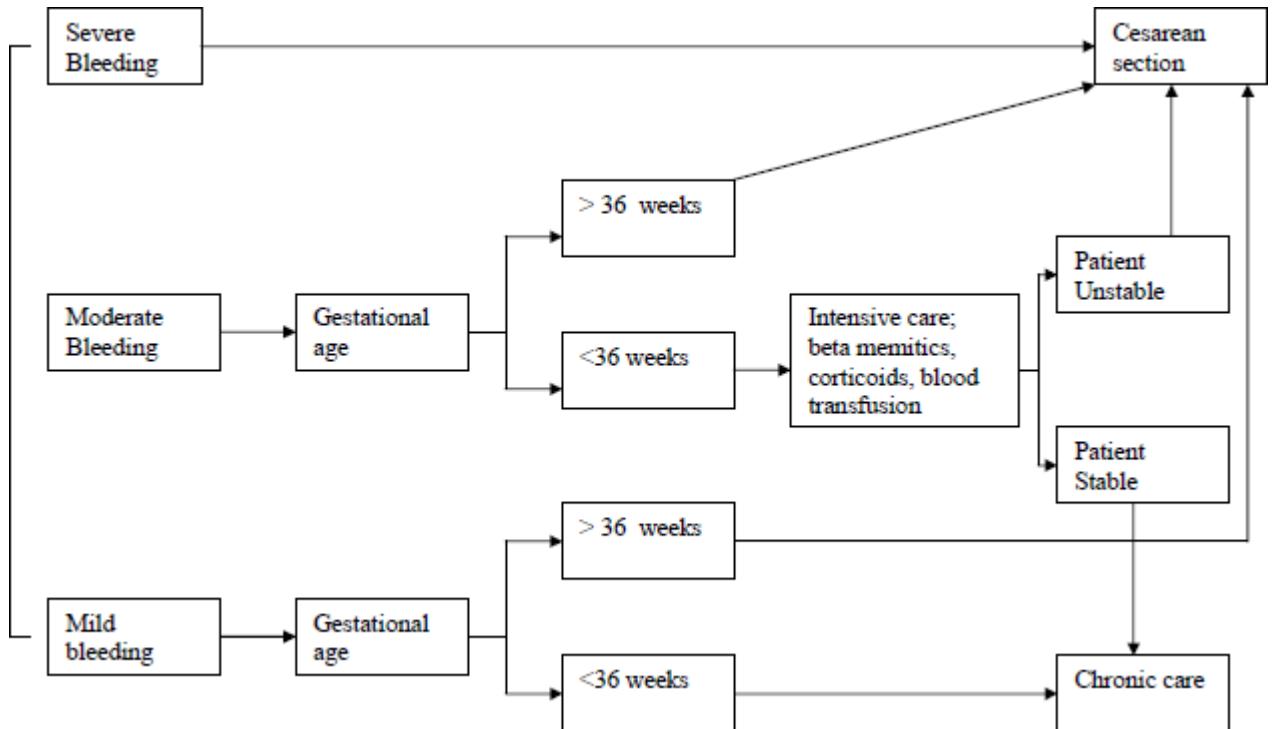


Fig. Flow chart showing management of Placenta previa

In every case of placenta previa , be careful for postpartum haemorrhage.

ABRUPTIO PLACENTA

Definition:

Abruption placenta is the detachment of a normally located placenta from the uterus before the fetus is delivered. It is an obstetric emergency.

Types:

It can be classified as-

- Revealed (separation of placenta with blood visible outside)
- Concealed (blood collects behind the separated placenta. Not visible outside)
- Mixed, (common type).

According to Sher clinical grading for placental separation

1. Grade 1: (Herald bleed) diagnosed retrospectively
 1. Less than 100cc -150cc of uterine bleeding
 2. Uterus non-tender
 3. No Fetal Distress
2. Grade 2 ; Classical features of abruption
 1. Uterus tender
 2. Fetal Distress
 3. Concealed hemorrhage
3. Grade 3
 1. Fetal death
 2. Maternal shock
 3. Extensive concealed hemorrhage
 4. Coagulopathy

Incidence : 1-2%

Perinatal mortality rate associated with placental abruption is high.

Causes: unknown .

But following are risk factors:

- Increased age and parity
- Preeclampsia/ Chronic hypertension
- Preterm ruptured membranes
- Multifetal gestation
- Hydramnios
- Cigarette smoking
- Thrombophilias
- Prior abruption
- Uterine leiomyoma
- External trauma (Sudden jerk or assault over abdomen)

- Anaemia
- Short cord.

Complications:

Complications include the following:

- Maternal blood loss leading to shock, disseminated intravascular coagulation [DIC], multi-organ failure.
- Fetal distress or death
- IUGR if chronic and mild.
- In Rh negative mothers, chances of feto-maternal transfusion and Rh sensitization.
- Prematurity

Optimal diagnostic criteria, investigations, treatment & referral criteria for

Abruptio placentae are following:

Situation 1:

At Secondary Hospital/ Non-Metro situation: Optimal Standards of Treatment in Situations where technology and resources are limited.

a) Clinical Diagnosis:

Placental Abruption is a clinical diagnosis.

Severity of symptoms and signs depends on degree of separation and blood loss.

Symptoms:

- Vaginal Bleeding
- Uterine tenderness
- frequent uterine contractions

Signs:

- Vital signs suggestive of cardiovascular compromise
 - 1. Tachycardia
 - 2. Orthostatic changes in blood pressure and pulse
- Abdominal examination:
 - 1. Uterus may be larger than gestational age
 - 2. Uterine hyper tonicity
 - 3. Fetal demise(depending upon the severity)
- Hemorrhagic shock disseminated intravascular coagulation.

Diagnosis is made by clinical picture and confirmed by ultrasonography.

b) Investigations:

- Full blood count
- Blood grouping and typing, cross match
- Coagulogram for DIC screening
- Fetal heart monitoring
- Trans-abdominal *ultrasonography done for evaluation of fetal presentation, size, fetal well-being and placental localization and separation.*

c) Treatment:

1. Bed rest for mild symptoms
2. Prompt delivery for severe symptoms with aggressive supportive measures.

Prompt delivery is usually indicated if any of the following is present(grade 2 or 3 abruption)

- a) Maternal hemodynamic instability
- b) Non-reassuring fetal heart rate pattern on cardiotocography
- c) Near-term pregnancy

3. Resuscitation:

1. Start IV Line with normal saline and refer to higher centre.
2. Blood transfusion: Explain the need of blood replacement and send the relatives blood donation.
3. Vaginal delivery may be tried if patient is in advanced labour and baby is either not compromised or IUD.

4. Definite management:

Stable patient (Grade I) management :

- Hospitalization
- Bed rest if the pregnancy is not near term and if mother and fetus are stable.

Patient is followed up if:

- i. Bleeding does not threaten the life of the mother or fetus.
- ii. The fetal heart rate pattern is reassuring.
- iii. The pregnancy is not near term.
- iv. No Coagulopathy
- v. Optimal urinary output

This approach ensures close monitoring of mother and , if needed, rapidly treated.

Corticosteroids should be considered (to accelerate fetal lung maturity) if gestational age is < 34 wk. Injection Betamethasone 12 mg. IM 12hrs.apart total of two injections.

If bleeding resolves and maternal and fetal status remains stable, ambulation may be allowed.

Patient may be discharged from hospital if pregnancy is not term. Patients are followed up in ante natal clinic.

If bleeding continues or if status deteriorates, prompt delivery is indicated.

Per vaginal examination is done in operation theatre and if findings are favourable, artificial rupture of membrane is done to augment the labor with syntocinon. If per vaginal findings are not favourable, caesarean section may be done. Complications and shift to grade 2 or 3 abruption can happen any time so patient should be referred to higher center for monitoring.

d) Complications:

Maternal complications

- i. Hypovolemic shock
- ii. Renal Cortical necrosis
- iii. Coagulopathy
- iv. Amniotic fluid embolism
- v. Maternal Death
- vi. Uteroplacental apoplexy (Couvelaire uterus) \
- vii. Bleeding into myometrium results in hypotonic wall
- viii. Risk of post partum hemorrhage

Fetal complications

- Intrauterine growth retardation
- Still birth

e) REFERRAL CRITERIA :

Shift to hospital where blood bank, neonatal and emergency cesarean section facilities and facility to treat multi organ failure and DIC are available.

Situation 2:

At Super Specialty Facility in Metro location where higher-end technology is available:

- a) **Clinical Diagnosis:** Detailed history, physical examination and investigations, will be done to confirm the diagnosis.
- b) **Investigations:** Blood count, Blood grouping and typing, cross match, Coagulogram for DIC screen.
- c) **Ultrasound:** Evaluation of fetal presentation, size, fetal well-being and placental localization and separation.
- d) **Treatment:**
 - Admit
 - History & examinations
 - Assess blood loss .It is always more than revealed.
 - Treatment for placental abruption varies depending on gestational age and the status of the mother and fetus.
 - Begin continuous external fetal monitoring for both the fetal heart rate and contractions.
 - Obtain intravenous access using 2 large-bore intravenous lines.
 - Institute crystalloid fluid resuscitation for the patient.
 - Type and cross match blood.
 - Begin a transfusion if the patient is hemodynamically unstable after fluid resuscitation.
 - Correct coagulopathy, if present.
 - Administer Rh immune globulin if the patient is Rh-negative.

Management of coagulopathy

Indicators for prompt delivery:

- a. Fetal distress (Non-reassuring fetal heart rate pattern).
- b. Maternal hemodynamic instability.
- c. DIC

- d. Labor
- e. Term

Vaginal delivery is acceptable as early as possible (generally preferred with DIC).

- If bleeding is heavy (revealed or concealed) deliver as soon as possible.
- Patient has to be delivered within 8 hours by Artificial rupture of membrane and Oxytocin 2.5units (not more than 5 units) in 500 cc of Dextrose.
- If cervix is fully dilated deliver by forceps or vaccum extractor.
- If vaginal delivery is not imminent or fetus is alive deliver by cesarean section.
- All precautions for the prophylaxis of third stage of labor. In every case of abruptio placentae, be prepared for postpartum haemorrhage.

FURTHER READING / REFERENCES.

1. Williams Obstetrics : 23rd edition
2. Practical guide to High Risk Pregnancy and Delivary by Fernando arias
3. RCOG Greentop guideline No: 27

RESOURCES REQUIRED FOR ONE PATIENT / PROCEDURE (PATIENT WEIGHT 60 KGS)

**(Units to be specified for human resources, investigations, drugs, and consumables
and equipment. Quantity to also be specified)**

Situation	Human resources	Investigations	Drugs and consumables	Equipment

1	Obstetrician	CBC	Gloves x 10 pairs	Stethoscope
	Physician	RBS	Drapes for	BP apparatus
	Anaesthetist	Urine r/e, c/s	delivery/Caesarean	Pulse oximeter
	Paediatrician	Blood Gp Rh	Suture materials	USG machine
	Nurses x 2	TSH	Foleys catheter	ECG monitors
	OT technician	Serology	Urobag	Xray
	Lab technician	VDRL	CVP line	Lab equipment
	House keeping	APTT,PT,INR	Arterial line	Labour room
		USG	IV canula	Labour couch
		ECHO	Drip sets	Delivery/Caesarean tray
		ECG	IV Fluids	Vacuum apparatus
		X Ray	TED Stockings	Boyles apparatus
				OT table
				Light source
				Oxygen
				Suction
				Baby warmer
2	Obstetrician	CBC	Gloves x 15 pairs	Stethoscope
	Interventional - Cardiologist	RBS	Drapes for	BP apparaus
	Paediatric - Cardiologist	Urine r/e, c/s	delivery/Caesarean	Pulse oximeter
	Cardiac - Anaesthetist	Blood Gp Rh	Suture materials	USG machine
	Neonatologist	TSH	Foleys catheter	ECG, Xray
	Intensive care	Serology	Urobag	Lab equipment
	Nurses x 5	VDRL	CVP line	Labour room
	OT technician	APTT,PT,INR	Arterial line	Labour couch
		USG	Venflons	Delivery tray
		ECHO	Drip sets	Caesarean tray
		ECG	IVFluids	Vacuum apparatus

	Lab technician	X Ray	Epidural	Boyles apparatus
	Porters	Cardiac	anaesthesia kit	OT table
	House	catheterization	General	Light source
	keeping	ABG studies	anaesthesia kit	Oxygen

CARDIAC DISEASE IN PREGNANCY

1. WHEN TO SUSPECT / RECOGNISE?

The physiological adaptations of normal pregnancy can induce symptoms and alter clinical findings that may confound the diagnosis of heart disease.

Heart disease should be suspected or diagnosed at booking for antenatal women.

Heart disease may be suspected when a pregnant lady presents with symptoms of progressive dyspnea or orthopnea, nocturnal cough, hemoptysis, syncope or chest pain.

When there are clinical findings like cyanosis, clubbing, distended neck veins, systolic murmur of grade 3/6 or greater, diastolic murmur, cardiomegaly, persistent arrhythmias, persistent split second sound, or pulmonary hypertension.

i. Introduction:

The incidence of heart disease in pregnancy is 1% and it is the third leading cause of death in women of reproductive age group. Risk of maternal mortality ranges from 0 to 50% depending on the cardiac condition.

ii. Case definition:

Rheumatic Heart Disease (RHD) remains an important cause of heart disease especially in developing countries like India. A large number of women undergoing valve replacement surgeries on oral anticoagulants warrant specialized care during pregnancy and childbirth.

With advances in paediatric cardiac surgery more women with congenital heart disease (CHD) are now surviving and reaching child bearing age. Ischemic heart disease is also on the rise as a result of increase prevalence of obesity, hypertension and diabetes in young adults and delayed child bearing.

Maternal mortality is higher in conditions that restrict an increase in pulmonary blood flow especially pulmonary hypertension and mitral stenosis. The situation is at its worst

in Eisenmengers syndrome, where there is refractory hypoxaemia when the mortality is 25 to 50 %.

Other cardiac complications associated with pregnancy include infective endocarditis, cardiac arrhythmias, development of cardiomyopathy.

Fetal outcome in pregnancies complicated by maternal RHD is usually good although there is an increased incidence of growth restriction and preterm birth.

The effects of maternal anticoagulant therapy with warfarin could lead to abortions, stillbirths in 7%, warfarin embryopathy in 8% of live born infants. Warfarin exposure in the 2nd and 3rd trimesters could lead to disharmonic growth of organs due to hemorrhage in the fetus and deformation from scarring leading to corpus callosum agenesis, Dandy Walker malformation, cerebellar midline atrophy, optic atrophy and blindness, microphthalmia, mental retardation and developmental delay.

Anticoagulation may be indicated in certain cardiac conditions such as mechanical heart valves, atrial fibrillation and pulmonary hypertension.

Fetal growth restriction and preterm birth are more common in pregnancies complicated by CHD with restricted maternal cardiac output, especially poor in cyanotic varieties when the fetal wastage rates may be as high as 40%. The etiology of CHD is multifactorial and incidence is 0.8 %. Incidence of CHD in the offsprings of parents with CHD ranges from 5 -10%. However, risk may be as high as 50% as in Marfan's syndrome.

iii. INCIDENCE OF THE CONDITION IN OUR COUNTRY

Nearly 1 % of all pregnant women have cardiac disease

iv. PREVENTION AND COUNSELING

Women may be aware of their cardiac condition before falling pregnant. An assessment of the patient's clinical status and ventricular function are necessary to best predict the outcome of pregnancy. In more than 50% of women it is first diagnosed during pregnancy.

A Cardiologist should be involved in initial assessment and followup. In some women, life threatening cardiac abnormalities can be reversed by corrective surgery and subsequent pregnancy is less dangerous.

Women with conditions like pulmonary hypertension, severe left sided obstructive lesions, dilated aortopathy(>4cm) and severe systemic ventricular dysfunction should be counseled for early termination of pregnancy to avoid maternal mortality.

Concurrent medical problems like infections, anaemia should be aggressively treated.

Pneumococcal and influenza vaccines are recommended to avoid respiratory infections precipitating cardiac failure. Cigarette smoking and illicit drug abuses are prohibited to prevent cardiorespiratory side effects and infective endocarditis.

Women with cardiac disease should be counseled regarding the risk of maternal death, possible reduction in maternal life expectancy, fetal issues, need for timely switch over of anticoagulant therapy, need for frequent hospital attendance and possible admission, intense feto-maternal monitoring during labour.

v. **DIFFERENTIAL DIAGNOSIS**

- a) Normal physiological changes of pregnancy
- b) Anaemia

vi. **OPTIMAL DIAGNOSTIC CRITERIA, INVESTIGATIONS, TREATMENT & REFERRAL CRITERIA .**

Situation 1: At Secondary Hospital/Non-Metro situation: Optimal Standards of treatment in situations where technology and resources are limited

a. Clinical Diagnosis:

A clinical suspicion or recognition of cardiac disease based on history, clinical symptoms and signs as explained above is made

b. Investigations:

Basic work up like complete blood counts, urine routine, blood grouping Rh typing, serology, VDRL, APTT, PT INR, scans for dating, aneuploidy screening and foetal anomalies.

Noninvasive studies like electrocardiography, echocardiography and chest radiography with abdominal shielding can be conducted during pregnancy to support the diagnosis.

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c. Treatment:

Clinical Classification Schemes commonly used are that of NYHA and ACOG. These classification systems are useful to clinicians to evaluate the functional capacity and to aid in counseling the woman regarding advisability of conception or continuation of pregnancy.

New York Heart Association (NYHA) Classification Scheme:

- Class I Uncompromised. No limitation of physical activity.
- Class II Slightly compromised. Slight limitation of physical activity.
- Class III Markedly compromised. Marked limitation of physical activity.
- Class IV Severely compromised. Inability to perform any physical activity without discomfort

Risk of Maternal mortality Caused by Various Types of Heart Disease (ACOG1992a):

<i>Cardiac disorder</i>	<i>Mortality %</i>
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<i>Group 1 - Minimal Risk</i>	<i>0-1</i>
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- Atrial septal defect
- Ventricular septal defect

- Patent ductus arteriosus
- Pulmonic or tricuspid disease
- Corrected Tetrology of Fallot
- Bioprosthetic Valve
- Mitral stenosis (NYHA Classes I and II)

Group 2- Moderate Risk **5-15**

2A:

- Mitral stenosis (NYHA Classes III and IV)
- Aortic stenosis
- Aortic coarctation without valvar involvement
- Uncorrected Fallot tetrology
- Previous myocardial infarction
- Marfans syndrome, normal aorta

2B:

- Mitral stenosis with atrial fibrillation
- Artificial valve

Group 3- Major risk **25-50%**

- Pulmonary hypertension
- Aortic coarctation with valvar involvement
- Marfan syndrome with aortic involvement

The management in most instances is by a multidisciplinary team involving:

- Obstetrician
- Physician /Cardiologist
- Anaesthetist
- Paediatrician

Most women with functional Class 1 and 2 go through pregnancy without morbidity. However, special attention should be directed toward both prevention and early recognition of heart failure. Indicators being cough, progressive edema, tachycardia, haemoptysis and basal rales. **Empirical therapy with diuretics and beta-blockers could be hazardous, so opinion of cardiologist /physician should be taken.**

Labour and Delivery:

Vaginal delivery is recommended unless there is an obstetric indication for caesarean section.

Await spontaneous onset of labour. Avoid induction of labour to minimize risk of intervention thereby haemorrhage and infections. However, despite the increased risks of hemorrhage, infection and large fluid shifts, there are a few conditions in which labor is ill-advised and cesarean delivery is recommended:

- Dilated aortic root (>4cm) or aortic aneurysm
- Acute severe congestive heart failure
- A history of recent myocardial infarction
- Severe symptomatic aortic stenosis
- Warfarin administration within 2 weeks of delivery
- Need for emergency valve replacement immediately after delivery

Careful fluid balance should be monitored. Avoid supine position. A semi recumbent position with lateral tilt preferred.

Monitor vitals - pulse, respiration, BP, Oxygen saturation and intake output.

Epidural analgesia by a skilled senior anaesthetist considering its hypotensive effect.

Cut short 2nd stage of labour with outlet forceps or vacuum extractor to reduce maternal effort.

Infective endocarditis prophylaxis is recommended preferably 30-60 minutes before the procedure. Either Ampicillin 2g or Ceftriaxone 1g is given iv (±1g vancomycin if Enterococcus infection is a concern) 600mg Clindamycin iv is recommended in cases of Penicillin allergy.

Avoid methyl ergometrine which causes intense vasoconstriction, hypertension and heart failure. Instead use syntocinon for delivery of placenta.

Close monitoring of cardiac patient should continue after delivery because early postpartum period is often a time of acute de-compensation.

d. Referral Criteria:

All patients with moderate and major risk of maternal mortality should be referred to a higher centre for following facilities:-

- a) Super specialists in cardiology and anesthesia with in-depth understanding of each cardiac condition are available.
- b) facilities should be available for obstetric care with intensive monitoring of mother and fetus under the supervision of a high risk pregnancy specialist(Obstetrician)
- c) Neonatologist with a well equipped NICU is available.
- d) Referral may be necessary for fetal echocardiography to plan neonatal care in advance.

Situation 2: At superspeciality Facility in Metro location where higher –end technology is available

a. Clinical diagnosis

A clinical suspicion or recognition of cardiac disease based on history, clinical symptoms and signs as explained above is made.

b.Investigations

Basic work up as in any pregnancy like complete blood counts, urine routine, blood grouping Rhtyping, VDRL, serology, APTT, PT, INR, ultrasound for dating, aneuploidy screening, anomaly scan. Fetal echocardiography when indicated depending upon the risk of transmission.

Noninvasive studies like electrocardiography, echocardiography and chest radiography with abdominal shielding can be conducted during pregnancy to support the diagnosis.

If indicated, cardiac catheterization can be performed with limited x-ray fluoroscopy by an interventional cardiologist.

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c. Treatment

Clinical Classification Schemes commonly used are that of NYHA and ACOG.

These classification systems are useful to clinicians to evaluate the functional capacity and to aid in counseling the woman regarding advisability of conception or continuation of pregnancy.

The management in most instances is by a multidisciplinary team involving:

- Obstetrician
- Cardiologist
- Cardiac Anaesthetist
- Neonatologist
- Intensivists

Antenatal period

Severe mitral stenosis is associated with a higher risk of pulmonary edema.

Both beta blockers and balloon mitral valvotomy are safe in pregnancy. Pulmonary edema should be treated in the usual way with oxygen and diuretics.

Women with prosthetic heart valves on oral anticoagulants will need replacement with heparin in early pregnancy between 6 to 12 weeks, to prevent embryopathy. Again warfarin should be discontinued and replaced with heparin at 35-36 weeks to allow clearance of warfarin from the circulation. Heparin is discontinued 4-6hrs before delivery and regional anesthesia to minimize risks of obstetric hemorrhage and spinal hematoma. Intravenous heparin is restarted 6 hrs after vaginal delivery and 24 hours after a caesarean section. Warfarin is usually started the night after delivery provided there are no bleeding complications and heparin is continued until

an INR of 2 or more is achieved. In an emergency situation VitK or fresh frozen plasma can be used to reverse warfarin anticoagulation and protamine sulfate for heparin anticoagulation.

Labor and Delivery

Vaginal delivery is recommended unless there is an obstetric indication for cesarean section.

1. Await spontaneous onset of labor and induction of labor should be very judiciously attempted to minimize risk of intervention thereby hemorrhage and infections.
2. Careful fluid balance with central venous pressure monitoring may be necessary to manage conditions like mitral stenosis and aortic stenosis optimally. Such monitoring is rarely indicated in women who have remained in functional class 1&2
3. Avoid supine position. A semi recumbent position with lateral tilt is preferred.
4. Monitor vitals - pulse, respiration, BP, Oxygen saturation and intake output.
5. Epidural analgesia is administered by cardiac anaesthetist judiciously based on the cardiac hemodynamics, as it causes hypotension.
6. Cut short 2nd stage of labor with outlet forceps or vacuum extractor to reduce maternal effort.
7. Infective endocarditis prophylaxis to be given with broad spectrum antibiotics.
8. Avoid methyl ergometrine which causes intense vasoconstriction, hypertension and heart failure. Instead use syntocinon for delivery of placenta.

Epidural anesthesia is preferred by most clinicians. Hypotension can be very hazardous with pulmonary hypertension or aortic stenosis , when narcotic conduction analgesia or general anesthesia may be preferable.

Peripartum Cardiomyopathy

Risk factors include multiparity, multiple pregnancy, hypertension, increased age.

Diagnostic criteria

- a) Development of cardiac failure in the last month of pregnancy or within 5 months after delivery.
- b) Absence of an identifiable cause for the cardiac failure.
- c) Absence of recognizable heart disease prior to the last month of pregnancy
- d) LV systolic dysfunction shown on echo as ejection fraction <45%, and LV end – diastolic dimension >2.7cm/sqm

Recommended treatment

- a) Fluid and salt restriction, treatment of hypertension, routine exercise postpartum if stable.
- b) Drugs like digoxin, beta blockers, diuretics, vasodilators may be used.
- c) In selected patients' aldosterone antagonists, inotropes, anticoagulation, implantable defibrillators, biventricular pacing, cardiac transplantation may be the last resort.

Prognosis and recurrence depends on the normalization of left ventricular size within 6 months of delivery.

d.Referral Criteria

Even in a metro situation a multidisciplinary specialist team with skill and facilities may not always be available under one roof. In such instances referral may be required to an optimal setup under one roof for best feto-maternal outcome.

FURTHER READING / REFERENCES

- Williams Obstetrics 23nd edition 2008
- Obstetrics and gynaecology Clinics Update on Medical disorders in Pregnancy, volume 37, No 2, June 2010
- American College of Obstetricians and Gynaecologists -Cardiac disease in pregnancy. Technical Bulletin No 168, June 1992a

RESOURCES REQUIRED FOR ONE PATIENT / PROCEDURE (PATIENT WEIGHT 60 KGS)
(Units to be specified for human resources, investigations, drugs, and consumables
and equipment. Quantity to also be specified)

Situation	Human resources	Investigations	Drugs and consumables	Equipment
1	Obstetrician Physician Anesthetist Pediatrician Nurses x 2 Ot technician Lab technician House keeping	CBC RBS Urine r/e, c/s Blood Group Rh typing TSH Serology VDRL APTT,PT,INR USG ECHO ECG X Ray	Gloves x 10 pairs Drapes for delivery/Caesarean Suture materials Foleys catheter Urobag CVP line Arterial line Venflons Drip sets IV Fluids TED Stockings	Stethoscope BP appar Pulse oximeter USG machine ECG monitors X ray Lab equipment Labour room Labour couch Delivery/Cesarean tray Vacuum apparatus Boyles apparatus OT table Light source Oxygen Suction Baby warmer
2	Obstetrician Interventional -	CBC RBS	Gloves x 15 pairs Drapes for	Stethoscope BP appar

	Cardiologist	Urine r/e, c/s	delivery/Caesarean	Pulse oximeter
	Pediatric -	Blood Gp Rh	Suture materials	USG machine
	Cardiologist	TSH	Foleys catheter	ECG,Xray
	Cardiac -	Serology	Urobag	Lab equipment
	Anaesthetist	VDRL	CVP line	Cath lab
	Neonatologist	APTT,PT,INR	Arterial line	Labour room
	Intensivist	USG	Venflons	Labour couch
	Nurses x 5	ECHO	Drip sets	Delivery tray
	Ot technician	ECG	IVFluids	Caesarean tray
	Lab technician	X Ray	Epidural	Vacuum appar
	Porters	Cardiac	anaesthesia kit	Boyles appar
	House keeping	catheterization	General	OT table
		ABG studies	anaesthesia kit	Light source
				Oxygen
				Suction
				ICU bed
				Syringe pumps
				Baby warmer

DYSFUNCTIONAL UTERINE BLEEDING

INTRODUCTION

DUB affects 22 to 30% of women and accounts for 12% of gynaecological referrals.

DUB is not one condition of one etiology – it is a group of disorders characterized by dysfunction of any part of the reproductive system – uterus, ovary, pituitary, hypothalamus, higher centers.

In clinical practice, the diagnosis of DUB is usually made by exclusion of organic disease of the genital tract or systemic organic disease.

DEFINITION

It is defined as abnormal uterine bleeding without any clinically detectable organic pathology.

How to make diagnosis?

History:

1. H/o Abnormal Uterine Bleeding:

- a) Excessive menses-duration of menstrual flow > 7 days or menstrual blood loss > 80 ml
- b) Frequent menses-duration of menstrual cycle < 21 days
- c) Irregular / acyclical uterine bleeding.

2. H/o Symptoms Suggestive Of:

- a) Pregnancy
- b) Dysmenorrhoea/ dyspareunia/ infertility may suggest endometriosis and PID, fibroids, adenomyosis
- c) H/o contraceptive practice, HRT

- d) Symptoms suggestive of hypothyroidism, bleeding disorders, other systemic illness
- e) Ingestion of drugs, like antiplatelet drugs (aspirin, clopedrogel)

Examination:

1. A general examination for signs of anemia, thyroid disease or bleeding disorders.
2. Abdominal examination for masses.
3. All women with abnormal genital tract bleeding must have a speculum examination to visualize the cervix, vagina and exclude any local cause.
4. Per vaginal examination – look for uterine enlargement (fibroids), tenderness/fixity (PID, endometriosis), any adnexal mass.

INCIDENCE:

1. Pubertal or adolescent DUB – usually women less than 20 yrs, incidence – 4%
2. Reproductive DUB – seen in women from 20 to 40 yrs, incidence – 57%
3. Perimenopausal DUB – women aged above 40 yrs, incidence – 39%
4. Postmenopausal DUB – incidence around 10%

DIFFERENTIAL DIAGNOSIS:

1. Pregnancy related bleeding
 - a) Abortions
 - b) Ectopic pregnancy
 - c) Gestational trophoblastic disease
2. Fibroid uterus
3. Endometrial cancer
4. Thyroid abnormalities

5. PID, Endometriosis.
6. Endometrial TB
7. PCOS

SITUATION 1:

DIAGNOSTIC CRITERIA, INVESTIGATION, TREATMENT & REFERRAL CRITERIA

DIAGNOSIS:

Clinical diagnosis is made by history and examination as explained above. Final diagnosis is only made after investigations.

INVESTIGATIONS:

- a) Urine pregnancy test
 - b) Complete blood count
 - c) Platelet count, BT, CT, PT, PTT especially in puberty menorrhagia not responding to treatment
 - d) Thyroid profile
 - e) LFT & RFT only in strongly suspected cases
 - f) USG – TAS/TVS: Ultrasound is the first-line diagnostic tool for identifying structural abnormalities.
 - g) Pap smear
 - h) Sonohysterography
 - i) Endometrial biopsy – by Novac curette, By Pipelle aspirator
- Women with irregular menstrual bleeding should be investigated for endometrial polyps and/or submucous fibroids.
 - Clinicians should perform endometrial sampling based on the methods available to them. An office endometrial biopsy should be obtained if possible in all women presenting with abnormal uterine bleeding over 40 years of age or

weighing more than or equal to 90 kg to exclude endometrial cancer or atypical hyperplasia, treatment failure or ineffective medical treatment

- D & C- mandatory in perimenopausal age group (>40 years) and is contraindicated in unmarried girls, puberty menorrhagia.
- j) Hysteroscopy – with hysteroscopic guided biopsy sensitivity is 98%. Hysteroscopy should be used as a diagnostic tool only when ultrasound results are inconclusive, for example, to determine the exact location of a fibroid or the exact nature of the abnormality. [A]

Hysteroscopically-directed biopsy is indicated for women with persistent erratic menstrual bleeding, failed medical therapy or transvaginal saline sonography suggestive of focal intrauterine pathology such as polyps or myomas.

- k) Laparoscopy – to exclude unsuspected pelvic pathology such as endometriosis, PID/Ovarian tumor. The indication is urgent if associated with pelvic pain.
- l) Saline infusion sonography should not be used as a first-line diagnostic tool.
- m) Magnetic resonance imaging (MRI) should not be used as a first-line diagnostic tool.

TREATMENT:

General

1. Assurance and sympathetic handling of physiological or emotional problems
2. Normal routine activities
3. Correction of anemia by diet, haematinic and even by blood transfusion
4. Clinically evident systemic/endocrine abnormalities should be investigated and treated accordingly

Medical Management:

Non hormonal methods:

1. Anti fibrinolytic agents – oral/IV tranexemic acid – 500 mg-1gm twice or thrice daily till severe bleeding. Effective in ovulatory DUB, iatrogenic menorrhagia secondary to insertion of IUD, Von Wilibrand's disease

2. Prostaglandin synthetase inhibitors (NSAIDS) – Mefenamic acid – 250 mg – 500 mg – twice or thrice daily, effective in ovular DUB
3. Ethamsylate – 250 – 500 mg TDS oral/IV
4. Anti tubercular treatment when disease is confirmed

Hormonal Method:

To stop acute episodes of bleeding and to regulate the cycles

1. Progestins

- a. Tab nonethisterone 20 – 30 mg/day in divided doses. It arrests bleeding in 24 – 48 hrs; later dose is tapered and continued in cyclical fashion from 5th day of withdrawal flow in subsequent cycles for 3 to 4 cycles.
- b. Similarly Medroxy progesterone acetate (MPA) can also be used.

2. Cyclical therapy:

In ovular bleeding:

1. OCP is given from 5th to 25th day of cycle for 3 consecutive cycles.

In ovular bleeding where patients wants pregnancy or in case of irregular shedding or ripening dydrogesterone 10 mg per day from 16th to 25th day.

In anovular bleeding:

- a) MPA 10mg 5th to 25th day, NE 5mg 5th day to 25th day for 3 consecutive cycles
- b. DMPA – 150 mg I.m every three months useful in maintenance therapy in woman who have difficulty with or cannot take OCPs.
- c. Ormeloxifene (Sevista) – 2 tab of 60 mg/week that is on Sunday and Wednesday for 12 weeks, 1 tab of 60 mg on following Sunday or Wednesday for 12 weeks
- d. Levonorgestrel – Releasing IUD(Mirena)

Surgical Management

Hysterectomy – TAH/vaginal hysterectomy/laparoscopic hysterectomy.

Hysterectomy should not be used as a first-line treatment solely for HMB. Hysterectomy should be considered only when:

- Other treatment options have failed, are contraindicated or are declined by the woman
- There is a wish for amenorrhoea
- The woman (who has been fully informed) requests it
- The woman no longer wishes to retain her uterus and fertility

REFERRAL CRITERIA

- a) Puberty menorrhagia where bleeding disorders are suspected and further investigation are to be done.
- b) Young women who want to preserve the uterus and facilities for endometrial destruction and ablation are not available.
- c) Associated comorbid medical conditions in which surgery is required.

SITUATION 2

DIAGNOSTIC CRITERIA, INVESTIGATION AND TREATMENT

DIAGNOSIS: As in situation 1

INVESTIGATIONS:

In addition to investigations as in situation 1, certain specific tests like Specific tests for bleeding disorders :Testing for coagulation disorders (for example, von Willebrand disease) should be considered in women who have had HMB since menarche and have personal or family history suggesting a coagulation disorder. [NICE GUIDELINE 2007]

TREATMENT:

1. Along with the general and medical treatment as mentioned in situation 1.
2. **conservative surgeries:**

like Endometrial destruction or ablation – hysteroscopic and non hysteroscopic methods are available (TCRE, uterine thermal balloon ablation, radio frequency induced endometrial ablation, etc.)

3. Pre-requisite for undergoing these procedures:

- a) To exclude atypical endometrium
- b) CIN, Ca cervix, Ca endometrium has to be ruled out
- c) Not expecting 100% amenorrhea
- d) Uterus size less than 12 weeks
- e) No pelvic inflammatory disease
- f) Completed family
- g) If necessary patient should be ready to undergo hysterectomy
- h) Ready for regular follow up
- i) Surgically fit
- j) Patient should know that its not effective contraception

4. Associated co morbid medical conditions in which surgery is required:

(Hysterectomy).

Ectopic Pregnancy

Introduction

When implantation of the embryo occurs outside the uterine cavity is called ectopic pregnancy. Common site of implantation is in the fallopian tube.

The risk of death from an undiagnosed ectopic pregnancy is greater than that of an induced abortion or delivery. Therefore slogan is "***If you think ectopic then only you can diagnose ectopic***". Earlier the diagnosis, better is the prognosis with conservation of the reproductive capacity. Chances of a subsequent successful pregnancy are reduced in these women.

Risk factors for ectopic pregnancy

- PID
- Endometriosis
- IUCD use
- Progesterone only contraceptive pill use
- Pregnancy after tubal ligation, tubal surgery
- ovulation induction and assisted reproduction techniques,

I Case definition:

For both situations of care (mentioned below)

Implantation of the embryo anywhere else other than the endometrial lining of the uterine cavity is an ectopic pregnancy.

II. Incidence of the condition in our country:

1 to 3% of all pregnancies.

III. Differential diagnosis:

Very early intrauterine pregnancy

Heterotopic pregnancy

IV Optimal diagnostic criteria, investigations, treatment and referral criteria

Situation1.

At Secondary Hospital/ Non Metro situation: Optimal Standards of treatment in Situations where technology and resources are limited.

a) Clinical Diagnosis:

Presentation could be diverse depends on whether rupture has occurred. The reproductive age group woman may present with amenorrhoea, bleeding pv, pain abdomen, sometimes with shock due to rupture.

b) Investigations:

1. A urine pregnancy test should be positive
2. Ultrasound –abdominal/ vaginal- thickened echogenic endometrium, absent intrauterine gestational sac, sometimes a pseudosac, fluid in the culde sac, occasionally haematosalpinx, adnexal mass or a tubal ring representing the gestational sac.
3. Culdocentesis if ultrasound facility is not available
4. Blood grouping crossmatching and reservation
5. Histopathological examination of the operative specimen to confirm diagnosis.

c) Treatment:

The standard aim of care is to control the bleeding and remove the ectopic pregnancy.

Start an IV line, arrange for blood transfusion, rush patient to the operating room.

General anaesthesia, IV antibiotic prophylaxis given and catherised.

Abdomen entered through a transverse suprapubic incision.

The affected tube is brought out and salpingectomy is performed.

Strict haemostasis secured. Peritoneal cavity cleared of blood and blood products.

Mops and instruments counted and abdomen closed in layers.

Blood transfused depending on the amount of loss and post op hemoglobin.

Inj Anti D immunoglobulin given if the lady is Rh negative and husband
Rh positive

Patient should be advised to report immediately in future pregnancies

d) Referral Criteria:

When an unruptured ectopic pregnancy is diagnosed and facilities are lacking for timely monitoring of serum beta hcg titres and medical management.

When patient is stable and facilities or skill to offer laparoscopic surgery are not available

When heterotopic pregnancy is diagnosed and patient is desirous of continuing with the intrauterine conception.

After a life saving laparotomy, for need of blood transfusion.

Situation2.:

At Superspeciality Facility in Metro location where higher end technology is available.

a) **Clinical diagnosis:** Similar to situation 1

b) **Investigations:** As in situation 1.

Special investigations:

1. Serum Beta hCG titres need estimation serially to facilitate expectant management or medical manangement with Methotrexate.

When Methotrexate is used:

1. Complete blood count
2. Liver function test
3. Renal function test

c) **Treatment:**

When ruptured ectopic is diagnosed laparotomy may be done as in situation 1.

When laparoscopy is chosen- Salpingostomy or salpingectomy is peformed.

Expectant management : Proportion of all ectopics will not progress to tubal rupture, but will regress spontaneously and be slowly absorbed. Level of hCG must fall and the woman becomes clinically well.

it is an option for clinically stable asymptomatic women with an ultrasound diagnosis of ectopic pregnancy and a decreasing serum hCG, initially less than serum 1000 iu/l.(ref rcog greentop)

Women managed expectantly should be followed twice weekly with serial hCG measurements and weekly by transvaginal examinations to ensure a rapidly decreasing hCG level (ideally less than 50% of its initial level within seven days) and a reduction in the size of adnexal mass by seven days. Thereafter, weekly hCG and transvaginal ultrasound examinations are advised until serum hCG levels are less than 20 iu/l .

On hcg monitoring if the level increases or plateaus ,active medical management is resorted to.

Medical management with Methotrexate –. (rcog greentop)

The most widely used medical treatment at present is intramuscular methotrexate given as a single dose calculated from patient body surface area.

Dose:

A single dose of 1mg/kg body weight or 50mg/square metre body surface area of methotrexate given intramuscularly in addition to leukovorum (folic acid antagonist) 0.1mg/kg IM.

Methotrexate should not exceed 4 doses.

There is 70-95% efficiency in the treated cases.

It takes 4-6 weeks for the complete resolution of ectopic pregnancy with methotrexate.

Methotrexate is also useful in the management of persistent ectopic which is a complication of conservative surgical treatment and incomplete removal of trophoblastic tissue.

Serum hCG levels are checked on days four and seven and a further dose is given if hCG levels have failed to fall by more than 15% between day four and day seven. Large uncontrolled studies have reported that about 14% of women will require more than one dose of methotrexate and less than 10% of women treated with this regimen will require surgical intervention.

Can be considered for women with confirmed or high suspicion for ectopic pregnancy who are hemodynamically stable with no evidence of rupture.

Absolute contraindications are breast feeding, immunodeficiency, alcoholism, blood dyscrasias, active pulmonary disease ,peptic ulcer disease,hepatic renal or hematologic disorder. Gestation sac larger than 3.5 cm and embryonic cardiac motion are relative contraindications

Medical management with Methotrexate-**d. Referral criteria:**

1. Patients with comorbidities requiring multidisciplinary input.
2. When skilled manpower and facilities are not available.
3. When it is a heterotopic pregnancy usually a consequence of assisted reproductive techniques, referral to an ART center for further care is necessary.

V. Further reading and references:

RCOG guidelines

Williams Obstetrics

Te Linde's operative gynecology

Novaks text book for gynecology

VI. Resources required for one patient/procedure

Situation	Human resources	Investigations	Drugs and consumables	Equipment
1.	Gynecologist Anesthetist Nurses 2	Blood tests		Boyles OT Laparotomy set
2.	Gynecologist Assistant doctor Anaesthetist Nurses x 3 Sonologist Technicians x2 House keeping Blood bank officer	Blood tests HCG quantitative	Methotrexate	Boyles OT Laparotomy set Laparoscopy set Laboratory Ultrasound machine

ANEMIA IN PREGNANCY

Anemia is defined as a decrease in the oxygen carrying capacity of the blood due to decrease in amount of RBCs or haemoglobin or both.

I. WHEN TO SUSPECT/ RECOGNIZE?

- WHO - Hemoglobin <11gm/dl or less

-Mild	8-11 gm/dl
-Moderate	5-7 gm/dl
-Severe	below 5 gm/dl

- ICMR categories

-Mild	10-10.9 gm/dl
-Moderate	7-10 gm/dl
-Severe	below 7gm/dl
-Very severe(decompensated)	below 4gm/dl

- RBC<3.2million

- PCV<33%

Introduction:

Anemia is a major problem in women of child bearing age in developing countries with effects that may be deleterious to mothers and fetuses.

Over one third of the world's population suffers from anemia, mostly iron deficiency anemia. India continues to be one of the countries with very high prevalence. National Family Health Survey (NFHS-3) reveals the prevalence of anemia to be 70-80% in children, 70% in pregnant women and 24% in adult men. Prevalence of anemia in India is nearly two thirds of the pregnant women because of low bioavailability diet, defective absorption & chronic blood loss due to hook worm infestation & malaria and rapidly successive multiple pregnancies. Iron deficiency anemia is responsible for 95% of the anemias during pregnancy.

In India, anemia is directly or indirectly responsible for 40 percent of maternal deaths due to haemorrhage, cardiac failure, infection & preeclampsia. India contributes to about 80 per cent of the maternal deaths due to anemia in South Asia. There is 8 to 10-fold increase in MMR when the Hb falls below 5 g/dl. Maternal anemia is associated with increased perinatal morbidity & mortality rates consequent to IUGR, preterm births, low iron stores and cognitive & affective dysfunction in the infant.

India was the first developing country to take up a National Programme to prevent anemia among pregnant women and children. The National Anemia Prophylaxis Programme of iron and folic acid distribution to all pregnant women in India through the primary health care system was evolved and implemented from 1972. In order to tackle this public health problem, a multi-pronged 12 x 12 initiative has also been launched in the country. The initiative is targeted at all adolescents across the country with the aim for achieving hemoglobin level of 12 gm% by the age of 12 years by 2012.

INCIDENCE OF THE CONDITION IN OUR COUNTRY

- ② Incidence- About one third of the global population(over 2 billion) are anemic
- ② CDC-Up to 56% of all women in India are anemic ($Hb < 11 \text{ g/dl}$)
- ② NNMB, DLHS and ICMR surveys showed that over 70 percent of pregnant women are anemic

The World Health Organization (WHO) estimates that 42% of all women, and 65-75% of pregnant women in our country are anemic. In India, the second National Family Health Survey in 1998–1999 (NFHS-II) showed that 54% of rural women of childbearing age were anemic compared with 46% of women in urban areas. Kerala has only a 23% prevalence of anemia compared with 62% in many northeastern states of India.

III. DIFFERENTIAL DIAGNOSIS

- ② Nutritional
- ② Hemorrhagic
- ② Hemoglobinopathies
- ② Bone marrow disorder
- ② HIV
- ② Drug induced
- ② Tuberculosis
- ② Inherited disorders

- ② Anemia caused by inflammation, malignancy, chronic diseases & autoimmune disorders

IV. OPTIMAL DIAGNOSTIC CRITERIA, INVESTIGATIONS, TREATMENT & REFERRAL CRITERIA

Complete medical history and Physical examination is very important.

***Situation 1: At Secondary Hospital/ Non-Metro situation: Optimal Standards of Treatment in Situations where technology and resources are limited**

a) Clinical Diagnosis:

Symptoms:

1. Weakness
2. Easy fatigability
3. Lassitude
4. Dizziness or vertigo especially when standing
5. Headache
6. Irritability
7. Indigestion, loss of appetite
8. Breathlessness
9. Palpitations
10. Generalized swelling
11. Symptoms due to cause of anemia like yellowing of skin & mucous membranes, bleeding from rectum etc.

Signs:

1. Pallor
2. Icterus
3. Glossitis, stomatitis
4. Koilonychia
5. Tachycardia, systolic murmurs, bounding pulse
6. Fine crepitations at lung bases

7. Splenomegaly
8. Hepatomegaly
9. Edema

b) Investigations:

- Hb%
- PCV
- Peripheral smear for immature cells, type of anemia and MP.
- Urine routine and microscopy, Urine C/S if required
- Stool for Routine and microscopy
- USG abdomen

c) Treatment:

Although there are several different forms of anemia, this health profile will only address the three most common: iron-deficiency anemia, vitamin B12 anemia and folic acid deficiency.

Non-drug treatment

- ② Awareness/ Education
- ② Improvement of dietary habits-diet rich in Vit C, protein and iron, cooking in iron utensils, avoiding tea & coffee intake with meals & overcooking
- ② Food Fortification
- ② Social services such as improvement of sanitation & personal hygiene for eradication of helminthiasis
- ② Annual screening for those with risk factors
- ② Routine screening for anaemia & providing iron supplementation for adolescent girls from school days

Iron rich foods: Pulses, cereals, jaggery, Beet root, Green leafy vegetables, nuts, meat, liver, poultry, Egg, fish, legumes, dry beans, and dry fruits viz: dates, figs, apricots etc .

Drug treatment: Prophylaxis
WHO recommendation

- ② 60mg elemental iron and 0.25mg folic acid daily

- ② To be given for 6 months in countries with prevalence <40% & additional 3 months postpartum where the prevalence >40%

Government of India recommendation

- ② 100mg elemental iron and 0.5mg folic acid daily
- ② To be given in the second half of pregnancy and lactation for atleast 100 days

Ferrous sulphate is least expensive and best absorbed form of iron. It also allows more elemental iron absorbed per gram administered. If for some reason, this is not tolerated, then ferrous gluconate & fumarate are the next choice for iron therapy.

Treatment of Iron deficiency has included:

- ② Oral iron
- ② Parenteral iron
- ② Blood transfusion

② Oral Iron

- First line therapy
- 200mg FeSO₄ (60mg elemental iron) 2- 3 times daily in conjunction with folic acid.
- If patient is non-compliant to oral therapy or if there is gastritis, then reduce doses & give it after meals or change over to ascorbic acid/ carbonyl iron or parenteral therapy.
- Diagnostic reevaluation if there is no significant clinical or haematological improvement within 3 weeks.

② Parenteral Therapy:

Indications:

- Hb less than 7g/dl and pregnancy >30 weeks
- Malabsorption Syndrome
- Incapacitating side effects with oral iron

Preparations:

- Iron sucrose
- Iron dextran

- Iron sorbitol citrate

Total iron deficit (mg) = Amount of iron deficit + amount of iron to replenish stores

Amount of iron deficit (mg) = $(\text{Hb target} - \text{Hb initial}) \text{gm/dl} \times \text{Body wt (Kg)} \times 2.2 + \text{Stores}$

Or

$(100 - \text{Hb initial})\% \times \text{Body wt (Pounds)} \times 0.3 + \text{Stores}$

where

Stores (mg) = 50% of deficit or approx 1000mg

Iron Sucrose Complex is considered to show a significant improvement of Hb and iron stores in pregnant women.

The target Hb may be taken as 11gm% for the Indian population according to WHO guidelines.

② **Deworming** necessary :

- Albendazole 400 mg single dose
 - Mebendazole 500 mg single dose or 100 mg twice daily for 3 days
 - Levamisole 2.5 mg/kg single dose, best if a second dose is repeated on next 2 consecutive days
 - Pyrantel 10 mg/kg single dose, best if dose is repeated on next 2 consecutive days
 - To prevent recurrence, patients should be advised to use footwear, improve sanitation, and personal hygiene.
- ② Malaria prophylaxis in endemic area to be treated.

Treatment of Folic Acid/ Vitamin B12 deficiency

② Tab. Folic acid 5 mg daily

Prophylactic - all woman of reproductive age should be given 400mcg of folic acid daily.

Preventive daily or intermittent iron or iron+folic acid supplementation taken by women during pregnancy reduces anaemia in mothers. There is evidence that taking iron or iron and

folic acid daily or intermittently has a similar effect in reducing anaemia at term and improving haemoglobin concentrations in the mother.

② Vitamin B12 deficiency:

Oral preparation of Vitamin B12 (not very effective)

In Moderate cases- 1000mcg of Parenteral Cyanocobalamin every month

In Severe cases 1000mcg/day for 1 week, following by weekly for 1 month

d) Referral criteria:

- ② Hb less than 5 gm% in all trimesters, less than 7gm% if >36 weeks
- ② Cases not responding to treatment
- ② Associated with medical disorders eg: leukaemias/ other obstetric complications
- ② Haemolysis or evidence of bone marrow suppression
- ② Other types of anemia (Sickle cell anemia, Thalassemia)
- ② Level II USG to rule out fetal complication/ compromise by CVS/ Amniocentesis .
- ② If any of the below suspected, as the below are common in pregnancy:
 - **Maternal risks during Antenatal period:** Poor weight gain, preeclampsia, eclampsia, placenta previa, accidental haemorrhage, premature rupture of membranes, preterm labour, cardiac failure etc.
 - **Maternal risks during Intranatal period:** Dysfunctional labour, accidental hemorrhage, shock, anesthesia risk, cardiac failure, if signs of respiratory distress
 - **Maternal risks during Postnatal period:** Postnatal sepsis, sub involution, embolism, PPH (primary, secondary).

Situation 2: At Super Specialty Facility in Metro location where higher-end technology is available

A) Clinical Diagnosis: Same as situation 1

B) Investigations:

- ② Same as situation 1, in addition
- ② CBC with peripheral smear
- ② Reticulocyte count

- ② Red cell indices
- ② LFT, RFT, LDH
- ② Coombs Test
- ② Iron studies
 - serum iron
 - serum iron binding capacity
 - serum ferritin
- ② Hb electrophoresis
- ② Bone marrow aspiration/ Biopsy

C)Treatment: Same as situation 1

- ② Confirm iron deficiency anaemia
- ② Treatment of IDA includes :
 - ② Oral iron,
 - ② Parenteral iron,
 - ② Recombinant erythropoietin and
 - ② Blood transfusion
- ② Inj. Iron Dextran (50 mg / ml elemental iron) 2 cc IM on alternate day after test dose x 10 injections by Z technique.
- ② **Blood Transfusion**
 - Packed cells to be transfused.
 - Indications
 - Hb < 7 gm/dl & POG > 36 weeks
 - Hb < 6 gm/dl & POG < 36 weeks
 - CHF due to anaemia(exchange transfusion)
 - Replenish blood loss due to APH/PPH
 - Not responding to oral & parenteral therapy
 - ② Diagnosis & management of sickle cell disease, Haemoglobinopathies, Pancytopenia in cases not responsive to iron.
 - ② Manage congestive cardiac failure/ PIH / Placenta Previa if associated/ where indicated.

Megaloblastic Anemia

- ② VitB 12 or Folic Acid Supplementation

LABOUR MANAGEMENT:

Oxygen and other measures to deal with heart failure and PPH to be kept ready.

- ☒ To cut short second stage by Outlet forceps/vacuum delivery of fetus.
- ☒ To routinely employ active management of third stage of labour.
- ☒ LSCS only for Obstetric Indications .

POSTPARTUM MANAGEMENT:

- ☒ Iron should be continued till the patient restores her normal clinical & haematological state & for an additional 3 months for store replenishment.
- ☒ Dietary advice
- ☒ Effective method of contraception as per WHO guidelines & should not conceive for atleast 2 years giving time for iron stores to recover.
- ☒ Sterilization is preferred if the family is complete.

RESOURCES REQUIRED FOR ONE PATIENT / PROCEDURE (PATIENT WEIGHT 60 KGS)

(Units to be specified for human resources, investigations, drugs, and consumables and equipment. Quantity to also be specified)

Situation	Human resources	Investigations	Drugs and consumables	Equipment
1. At Secondary Hospital/ Non-Metro situation Optimal Standards of Treatment in Situations where technology and resources are limited	Obstetrician Physician Pathologist Lab technician House keeping	Hb% PCV RBC Peripheral smear Urine routine and microscopy Stool for Routine and Microscopy	Gloves x 10 pairs Drapes for delivery/Caesarean Suture materials Foleys catheter Urobag Venflons Drip sets IVFluids Antiseptics, Compatible blood/packed cells	Stethoscope BP apparatus Pulse oximeter USG machine ECG monitors Lab equipment Labour room, CTG Labour couch Delivery/Caesarean tray Vacuum apparatus Boyles appar OT table Light source Oxygen Suction Baby warmer

2. At Super Specialty Facility in Metro location where higher-end technology is available	Obstetrician Pathologist Anaesthetist Neonatologist Intensivist Nurses x 5 OT technician Lab technician Porters House keeping	CBC Peripheral blood smear Reticulocyte count Urine routine and microscopy Stool for Routine and Microscopy Iron studies LFT,RFT,LDH Coombs Test Hb electrophoresis Bone marrow aspiration/ Biopsy	Gloves x 15 pairs Drapes for delivery/Caesarean Suture materials Foleys catheter Urobag CVP line Arterial line Venflons Drip sets IVFluids Epidural anaesthesia kit General anaesthesia kit Drugs to manage cardiac failure , PPH	Stethoscope BP apparatus Pulse oximeter USG machine ECG Lab equipment Automated cell counter Biochemistry analyser Labour room, CTG Labour couch Delivery tray Caesarean tray Vacuum apparatus Boyles apparatus OT table Light source Oxygen Suction ICU bed Syringe pumps Baby warmer
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DIABETES AND PREGNANCY

1. WHEN TO SUSPECT OR RECOGNIZE?

- a) **Introduction:** The prevalence of pre existing diabetes in pregnancy is increasing in parallel with the rise in the rates of obesity.

Diabetes in pregnancy is associated with risks to the woman & to the developing fetus. Miscarriage, preeclampsia and preterm labor are more common in women with preexisting diabetes. In addition, diabetic retinopathy can worsen rapidly during pregnancy. Stillbirth, congenital malformations, macrosomia, birth injury, perinatal mortality & postnatal adaption problems such as hypoglycaemia are more common in babies born to women with pre existing diabetes.

Outcomes of diabetic pregnancies have improved for the mother and the newborn due to understanding of the disease process, improved education, and new treatment modalities delivered in a team approach. Nausea and vomiting of pregnancy and associated insulin resistance can make glycaemic control a challenge. Care of women with preexisting diabetes demands careful monitoring in the preconception, prenatal, and postpartum periods.

Controversies still exist in screening, management, & treatment of gestational diabetes.

- b) **Case definition:**

For both situations of care (mentioned below)

Pre gestational diabetes: Women who present with keto acidosis or random plasma glucose levels greater than 200mg/dl plus classical signs and symptoms such as polyphagia, polyuria or polydipsia are labeled as pregestational diabetes. American Diabetes Association (2004) also recommends that pregnant women with fasting glucose levels of 126mg/dl or greater be considered to have overt diabetes.

Gestational diabetes mellitus: Current practice is a 2 step testing, screening and diagnosis. Universal screening is recommended in India as Asians are a high risk group for diabetes.

- O'Sullivan 50 g glucose, 1 hour screening test cutoff ranges from 130mg/dl to 140 mg/dl.
- ② The next step, diagnostic 3 hour 100gm GTT has atleast 2 different algorithms for diagnosis of GDM.

Diagnostic parameters for the 3 hour, 100g GTT

NDDGC CCC

time	mg/dl	mg/dl
FBS	105	95

1hr	190	180
2hr	165	155
3hr	145	140

NDDGC-National diabetes data group criteria

CCC -Carpenter Coustan Criteria

- ② Recently, a single step 75 gm oral glucose tolerance test is also being used wherein a 2 hr plasma glucose level is measured after random administration of oral glucose. A plasma value > 140 mg% is diagnostic of GDM. It serves both as a screening & a diagnostic test. However, further studies are required before it is put to routine use in India.

II. INCIDENCE OF THE CONDITION IN OUR COUNTRY:

%of mothers

III. DIFFERENTIAL DIAGNOSIS:

Glycosuria of pregnancy

IV. PRECONCEPTIONAL CARE:

Preconception Counselling

All women of reproductive age with preexisting diabetes should be advised about the potential benefits of prepregnancy planning. They should be offered education on the role of diet, appropriate body weight, and exercise. The American Diabetes Association has defined optimal preconceptional glucose control using insulin to include self-monitored preprandial glucose levels of 70 to 100 mg/dL and postprandial values $_ 140$ mg/dL and $_ 120$ mg/dL at 1 and 2 hours, respectively. A reasonable target for HbA1c in prepregnancy counseling is to aim for 6%. An improvement in HbA1C levels can also be achieved by switching to short acting modern analogue and by enrolling the prepregnant subject into education programs that teach enhanced carbohydrate counting. Women with diabetes whose HbA1c is above 10% should be strongly advised to avoid pregnancy. In prepregnancy counseling the current drug regime should also be reviewed. Some hypoglycemic drugs and the newer long acting insulin analogues have not been evaluated for safety in pregnancy and they should be replaced. Antihypertensives particularly ACE inhibitors and angiotensin receptor antagonists should be discontinued prior to pregnancy. Finally, folic acid, 400 µg/d, is given periconceptionally and during early pregnancy to decrease the risk of neural-tube defects. When pregnancy occurs without any prepregnancy counseling, then an urgent assessment of all the previous factors should be undertaken as soon as possible at the antenatal clinic. Retinal & renal assessments are mandatory in all cases.

V. OPTIMAL DIAGNOSTIC CRITERIA, INVESTIGATIONS, TREATMENT AND REFERRAL CRITERIA

Situation1: At Secondary Hospital/Non-Metro situation:Optimal standards of situation where technology and resources are limited

- a) **Clinical diagnosis:**As described in case definition. Women with risk factors for GDM should be carefully screened like the obese, prior GDM, prior macrosomic infant, elderly mothers, multiple pregnancy, south east Asians, Hispanics, African Americans, polycystic ovarian syndrome, family history of diabetes.

Such women at very high risk may benefit from early screening in the first trimester. If early screening is normal, screening is repeated at 24 to 26 weeks.

b) **Investigations:**

- Close monitoring of blood glucose, baseline& interval glycosylated haemoglobin levels and urine sugar & ketones are helpful throughout pregnancy.Target blood glucose values are fasting 95mg%, 1 hour 140mg% & 2 hour 120mg%.
- If a patient is controlled on diet, blood sugar monitoring with capillary blood glucose levels 4 times a day (FBS and PPBS thrice) are enough.
- Patients on pharmaceutical therapy- in addition need preprandial & 3 am values.
- Other investigations required specially include ultrasound for dating, aneuploidy screening , anomaly scanning, growth profile monitoring for fetal weight, AFI and biophysical profile is necessary in poorly controlled diabetics.
- Non stress test by 32 to 34 weeks. Lack of USG and NST facilities warrant referral to higher centers.

c) **Treatment:**

Diet and exercise are instituted first. For many patients with GDM ,oral hypoglycemic or insulin therapy may be avoided altogether with no increase in adverse perinatal outcomes on diet alone. For women of normal weight, the American Diabetes Association recommends a caloric intake of 30 to 35 kcal/kg, taken as three meals and three snacks daily. For underweight women, this is increased to 40 kcal/kg/d. For those more than 120 percent above ideal weight, it is decreased to 24 kcal/kg/d. An ideal dietary composition is 55 percent carbohydrate, 20 percent protein, and 25 percent fat with less than 10 percent as saturated fat. Generally a diet containing with CHO restriction to 45-60% preferably complex high fiber carbohydrates sources of known low Glycemic Index, lean proteins including oily fish, and a balance of polyunsaturated and monounsaturated fats is recommended. Women with a high BMI might be advised to restrict calorie intake with expert dietetic advice and consider suitable enhanced mild or moderate exercise during the pregnancy. 1 to 2 miles walk at least 3 times a week is recommended.

Pharmacotherapy with insulin is instituted when diet and exercise therapy fail as evidenced by an abnormality in more than half the self monitored glucose values or an abnormal value in those women tested weekly.

Recommended initial dose of Insulin is,
0.7-0.8 U/kg body wt in the 1st trimester
1.0 U/kg body wt in the 2nd trimester
1.2U/kg body wt in the 3rd trimester

Dose is adjusted according to the response of hyperglycaemia to initial therapy.

Of the calculated daily dose, 2/3rds is given before breakfast, divided as 2/3rd NPH insulin and 1/3rd regular insulin, and the remaining 1/3rd of the daily dose is given as 1/2 regular insulin before dinner and 1/2 NPH insulin at bed time.

Self-monitoring of capillary glucose levels using a glucometer is recommended because this involves the woman in her own care. The goals of glucose control recommended during pregnancy are Fasting ≤ 95 mg/dL, Premeal ≤ 100 mg/dL, 1-hr postprandial ≤ 140 mg/dL, 2-hr postprandial ≤ 120 mg/dL and 0200–0600 ≤ 60 mg/dL.

Antenatal care- twice weekly visits required. Well controlled diabetics can deliver at 40 weeks

Poorly controlled non compliant patients on pharmacotherapy need antenatal testing for monitoring macrosomia or growth restriction and timely planning of delivery when fetus is optimally mature with lung maturity.

Women with pregestational diabetes with nephropathy, retinopathy may worsen and warrant earlier delivery. Preeclampsia, and IUGR may set in.

Good glycaemic control during pregnancy can avoid ketosis and sepsis.

Diabetic ketoacidosis should be suspected when a pregnant diabetic mother presents with blood sugar more than 200mg/dl, vomiting and dehydration with low serum bicarbonate and presence of acetone as it could lead to fetal loss if not intensively managed in conjunction with a physician.

Preterm labor in diabetics can be managed with antenatal steroids &tocolysis. However, women with insulin treated diabetes who are receiving steroids for fetal lung maturation should be closely monitored and receive additional insulin according to protocol. Also, betamimetic drugs should not be used for tocolysis in such women.

Labor and delivery- Women with pregestational diabetes and GDM requiring pharmacotherapy are best managed with IV fluids(100-150ml/hr), insulin drips and hourly glucose monitoring protocols to maintain blood glucose values at around

100mg% during active labor. Women with very mild GDM may not require insulin therapy but should have blood glucose assessment during labor.

It is important to considerably reduce or delete the dose of long-acting insulin given on the day of delivery. Regular insulin should be used to meet most or all of the insulin needs of the mother at this time, because insulin requirements typically drop markedly after delivery. During labor and after delivery, the woman should be adequately hydrated intravenously and given glucose in sufficient amounts to maintain normoglycemia. Capillary or plasma glucose levels should be checked frequently, and regular insulin should be administered accordingly. It is not unusual for a woman to require virtually no insulin for the first 24 hours or so postpartum and then for insulin requirements to fluctuate markedly during the next few days. Infection must be promptly detected and treated.

When estimated fetal weight is above 4.5 kg, elective caesarean is planned to avoid shoulder dystocia and birth trauma. In those where the EFW ranges between 4 to 4.5 kg, other obstetric factors should be considered in decision making for caesarean section. Uncontrolled diabetes & presence of end organ disease are other indications of caesarean section.

Preparedness for the management of neonatal problems is a must.

Post partum management-A 75 g GTT should be performed at 6 to 12 weeks postpartum and other intervals thereafter for GDM mothers.

Subsequently, testing can be done annually or triannually(ADA recommendation).

Contraceptive advice needs to be given as per WHO recommendations.

Referral criteria:

- When careful monitoring facilities are not available.
- For expert opinion regarding anomalies and paediatric surgery and for fetal echocardiography.
- When there are comorbidities warranting multidisciplinary input especially in pregestational diabetics and poorly controlled gestational diabetics.
- When there is need for intensive neonatal care unit to manage problems in the newborn.

Situation 2: At Superspeciality Facility in Metro location where higher end technology is available.

- a) Clinical diagnosis: As described in situation1.

- b) Investigations: As described in situation I.Fetal echocardiography & periodic doppler studies if growth retardation present.
- c) Treatment: As described in situation 1. A multidisciplinary team is involved early in care and planned delivery is carried out in the presence of anomalies to facilitate optimal care in a tertiary center with good nicu and paediatricsurgeons.An endocrinologist is necessary for the management of DKA.
- d) Referral Criteria: Even in a metro situation not all centers will be equipped with the multiple specialists, skilled hands and facilities. The decision to refer to a better facility should be taken if it warrants to give the best care to the mother and the newborn.

Summary of antenatal care for women withdiabetes*

Visit	Measures
Preconceptional/ 1 st visit	<ul style="list-style-type: none"> -Offer information, advice and support in relation to establishing glycaemic control& effects of diabetes on pregnancy. -Review medications for diabetes and its complications. -Folic acid supplementation. -Take a clinical history to ascertain the extent of diabetes-related complications. -Offer retinal and renal assessment if these have not been undertaken in the previous 12 months.
5-6 weeks	<ul style="list-style-type: none"> -Confirm viability of pregnancy and gestational age. -Establish glycaemic control
16 weeks	<ul style="list-style-type: none"> Offer retinal assessment at 16–20 weeks to women with pre-existing diabetes who showed signs of diabetic retinopathy at the first antenatal visit.
22-24 weeks	<ul style="list-style-type: none"> Offer four-chamber view of the fetal heart and outflow tracts plus scans that would be offered at 18–20 weeks as part of routine antenatal care.
28 weeks	<ul style="list-style-type: none"> -Offer ultrasound monitoring of fetal growth and amniotic fluid volume. -Offer retinal assessment to women with pre-existing diabetes who showed no diabetic retinopathy at their first antenatal clinic visit.

32 weeks	Offer ultrasound monitoring of fetal growth and amniotic fluid volume.
36 weeks	<ul style="list-style-type: none"> -Offer ultrasound monitoring of fetal growth and amniotic fluid volume. -Offer information and advice about: <ul style="list-style-type: none"> i. timing, mode and management of birth ii. analgesia and anaesthesia iii. changes to hypoglycaemic therapy during and after birth iv. management of the baby after birth v. initiation of breastfeeding and the effect of breastfeeding on glycaemic control vi. contraception and follow-up.
38 weeks	Offer induction of labour, or caesarean section if indicated, and start regular tests of fetal well-being for women with diabetes who are awaiting spontaneous labour.
39 weeks	Offer tests of fetal well-being.
40 weeks	Termination of pregnancy in diet controlled diabetics.
*All women with diabetes should also receive routine antenatal care.	

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CARCINOMA CERVIX

Introduction and Case definition:

Carcinoma cervix is the cancer affecting the cervix, which is the lowermost part of the uterus. Cancer of cervix is a leading cause of mortality worldwide and especially in developing countries. Worldwide cancer cervix is the second most common cancer among women, next only to breast cancer. But among Indian women, cancer cervix is the commonest cancer. Invasive cancer of cervix is considered to be a preventable cancer as it is associated with a long pre-invasive state, which is detectable and treatable to a large extent. Various risk factors for carcinoma cervix are young age at first intercourse, multiple sexual partners, cigarette smoking, high parity and low socio-economic status. Human papillomavirus infection has been postulated to be the etiological factor for inducing dysplasia in the cervical epithelium. About 85% to 90% of cervical cancers are squamous cell carcinomas, and the rest 10–15% are adenocarcinomas.

Incidence in India:

Based on the data of the population based cancer registries, the estimated number of new cancers during 2007 in India was 90,708.¹ As per the same data, the age adjusted incidence rate of cervical cancer in India per 100,000 persons varies from 12.3 – 25.4 in various parts of the country.²

Prevention:

Detection of pre-malignant lesions by Pap smear testing and HPV-DNA testing followed by appropriate management of the detected lesions forms the mainstay of prevention of occurrence of invasive cervical cancer.

Differential diagnosis

- Fibroid polyp (especially when infected/ulcerated)
- Tuberculosis of cervix
- Cervical erosion

Optimal Diagnostic Criteria, Investigations, Treatment & Referral Criteria

Situation 1: At Secondary Hospital/ Non-Metro situation: Optimal Standards of Treatment in Situations where technology and resources are limited

A .Clinical Diagnosis:

History:

- Asymptomatic in early stages
- Vaginal bleeding (postcoital/irregular/postmenopausal)
- Foul smelling, blood stained vaginal discharge
- Loss of weight/ appetite
- Difficulty in micturition (advanced stages)

Examination:

- Malnourished, emaciated appearance (advanced stages)
- Supraclavicular/groin lymphadenopathy (advanced stages)
- Per speculum examination: Ulcero-proliferative friable growth on cervix with or without vaginal involvement. Cervix may bleed on touch.

Per vaginal examination: Expanded firm/friable irregular cervix

Recto-vaginal examination: Nodularity of parametria (parametrial extension of disease)

B .Investigations:

- CBC
- Blood grouping
- Cervical biopsy on out-patient basis at the time of speculum examination for confirmation of diagnosis where obvious growth is visualized
- In cases where no obvious lesion is found on the cervix at the time of visual examination, apply 3% acetic acid on cervix and take biopsy from dense white areas, if seen.
- Colposcope guided biopsy to be done in cases where there is abnormality detected on Pap's smear and no obvious lesion on cervix. If facility of colposcopy is not available due to lack of equipment or expertise, patient should be referred to a centre with these facilities are available.
- Endocervical curettage if there is suspicion of endocervical cancer.
- Cone biopsy may be done if required, but only after colposcopy.
- USG
- Contrast CT scan if required.

C.Treatment:

- Treatment of local infection with Tab. Ciprofloxacin 500mg BD X 5days & Tab. Metronidazole 400 mg TDS X 5days.
- Oral iron and other nutritional supplements for malnourished and anemic patients.

D.Referral criteria: All patients with carcinoma cervix should be referred to multi-specialty hospital that is adequately resourced and equipped with facilities for oncological surgeries, radiotherapy, chemotherapy and blood transfusion.

(* If a gynae-onco-surgeon is available along with anesthetist and blood bank facility, surgery for carcinoma cervix stage Ia & Ib1 may be done in situation1. In such situations, if need for post-operative radiotherapy arises, patient should be referred to situation 2 along with all records including surgical records)

Situation 2: At Super Specialty Facility in Metro location where higher-end technology is available

A. **Clinical Diagnosis:** Same as situation 1

B. Investigations:

- CBC
- Blood grouping
- Cervical biopsy on out-patient basis at the time of speculum examination for confirmation of diagnosis where obvious growth is visualized.
- Colposcopic examination and guided biopsy: in cases with abnormal Pap test results and no obvious lesion on the cervix.
- Endocervical curettage during colposcopy to rule out endocervical carcinoma
- Cervical conization in indicated cases.

When carcinoma cervix is confirmed, further investigations required are:

- KFT
 - LFT
 - Urine analysis
 - Chest X-Ray
 - IVP
 - Other investigations: Ultrasonography, MRI or contrast CT scan Abdomen if MRI is not possible and pelvis may be useful in select cases for planning therapy.
 - Cystoscopy / Barium enema / sigmoidoscopy- if imaging doesn't rule out involvement.
- Treatment:** Treatment modality depends on the stage of disease, age of the patient, patient's desire, need for preservation of ovarian function, presence of co-morbidities, associated gynecological conditions requiring surgery and availability of facilities and expertise.
- Various modalities available are:
- Surgery: For stages I & II a
 - Radiotherapy: For all stages
 - Chemo-radiation: For patients with high-risk cervical carcinoma after radical hysterectomy and in patients with locally advanced cervical carcinoma.

Surgery

- Advantages:
 - Conservation of ovaries
 - Surgical injuries to bladder/ bowel are easier to treat compared to chronic bladder and bowel problems resulting from radiation induced fibrosis and decreased vascularity.
- Disadvantages:
 - Not curative in advanced stages of carcinoma cervix
 - Requires expertise

Surgical management depends on the stage, depth of invasion and lymph-vascular space invasion.

Types of hysterectomies for carcinoma cervix:

Type II: Also called as modified radical/ Wertheim's hysterectomy. Medial half of cardinal and uterosacral ligaments are removed.

Type III: Also called as radical/ Meig's hysterectomy. Most of the utersacral and cardinal ligaments along with upper third of vagina are removed.

Type IV: Extended radical hysterectomy. The periureteral tissue, superior vesical artery and up to three-fourths of vagina are also removed.

Type V: Portions of distal ureters and bladder are also resected.

These days, type IV & type V hysterectomies are mostly not performed as patients with advanced malignancy are usually given radiotherapy.

Complications of radical hysterectomy:

- Acute complications:
 - Blood loss
 - Uretero-vaginal fistula (1% to 2%)
 - Vesico-vaginal fistula (1%)
 - Pulmonary embolus (1% to 2%)
 - Small bowel obstruction (1%)
 - Febrile morbidity (25 to 50%)
- Sub acute complications:

- Bladder dysfunction
- Lymphocyst formation (<5%)
- *Chronic complications:*
- Hypotonic bladder
- Ureteral strictures
- Recurrent cancer
- Lymphocyst formation

Radiotherapy:

- Advantages:
- Can be given in all the stages
- Cure rates equivalent to surgery in early stages
- Avoids surgical and anesthetic complications
- Disadvantages:
- Induces radiation fibrosis of bowel and bladder in 6%-8%
- May result in intestinal and urinary strictures (1.4%-5.3%)
- Induces vaginal fibrosis and stenosis
- Premature menopause due to the affects of radiotherapy on ovaries.

Clinical staging (FIGO) and stage-wise treatment recommendations

Stage I: Carcinoma confined to cervix

Stage Ia: Preclinical carcinomas of cervix, diagnosed only on microscopy

Stage Ia1: ≤3 mm invasion and <7mm width horizontally

No lymph-vascular space invasion -Conization/ Type I hysterectomy

With lymph-vascular space invasion-Type I or II hysterectomy with (?) pelvic lymph node dissection

Stage Ia2: >3-5mm invasion- Type II hysterectomy with pelvic lymphadenectomy

Stage Ib : >5mm invasion-Type III hysterectomy with pelvic lymphadenectomy and para-aortic lymph node evaluation.

Stage II: Carcinoma extending beyond the cervix but not up to lateral pelvic wall.

The carcinoma involves the vagina, but not the lower one-third.

Stage IIa: No obvious parametrial involvement- Type III hysterectomy with pelvic lymphadenectomy and para-aortic lymph node evaluation.

Concurrent chemo-radiation therapy may be offered as an alternative to radical surgery for stages Ib and IIa, especially when the lesion size is more than 4cm, as this has been shown to be associated with improved survival rates.

Indications of post-operative radiotherapy:

- Positive surgical margins
- Positive lymph nodes

Stages IIb to IVb: Concurrent Chemo-radiation (Cisplatin based chemotherapy) is the main stay of treatment. Palliative treatment may be offered in advanced stage carcinoma cervix.

Stage IIb: Obvious parametrial involvement

Stage III: Carcinoma extending up to the lateral pelvic wall.

Carcinoma involves the lower one-third of vagina.

Hydronephrosis or non-functioning kidney.

Stage IIIa: No extension to the pelvic wall

Stage IIIb: Extension up to the pelvic wall and/or hydronephrosis or non-functioning kidney.

Stage IV Carcinoma extended beyond the true pelvis or involved mucosa of the bladder or rectum.

Stage IVa: Spread of the growth to adjacent organs

Stage IV b: Spread to distal organs

Recurrent Cervical cancer: For patients, who were primarily treated with surgery, should be considered for radiotherapy and vice-versa.

Fertility sparing surgery;

Women requesting fertility conservation should be offered radical trachelectomy and pelvic lymph node dissection providing the tumour diameter is less than 2 cm and no lymphatic vascular space invasion is present.

Women with FIGO stage 1A2 and microscopic 1B1 may also be offered cold knife conisation or large loop excision of transformation zone combined with pelvic LN dissection.

Laparoscopic vaginal radical hysterectomy shd not be offered to patients with tumour diameter greater than 2 cm

Treatment during pregnancy;

For pregnant patients diagnosed with cervical cancer before 16 weeks of gestation immediate treatment is recommended

For pregnant pt with disease of stage FIGO 1A1, 1A2, 1B after 16 weeks of pregnancy may be delayed to allow fetal maturity

D. Referral criteria: In case of carcinoma cervix stage IIb or higher, it may be required to refer the patient to a cancer centre having facility for radiotherapy, as the same may not be available in all super-specialty hospitals.

References:

1. National Cancer Registry Programme (NCRP, ICMR). Time trends in cancer incidence rates: 1982-2005. Bangalore: NCRP; 2009.
2. A. Nandakumar, T. Ramnath & Meesha Chaturvedi. The magnitude of cancer cervix in India. National Cancer Registry Programme (ICMR), Bangalore, India. Indian J Med Res 130, September 2009, pp 219-221

Suggested Reading:

1. Novak's Gynaecology. Ed Berek JS. Fourteenth edition. 2006
2. Te Linde's Operative Gynaecology. Eds Rock J A, Jones III H W. Ninth edition 2003

ADNEXAL MASS

Introduction

The finding of an adnexal mass is a common clinical problem seen in women of all ages and presents a diagnostic and therapeutic challenge. Some of these are diagnosed incidentally during pelvic examination/radiographic imaging modalities. Primary goal of management is differentiation of gynecological from non-gynecological, and benign from malignant masses.

Evaluation and Diagnosis

Adnexal mass may represent structures in the uterine adnexa (ovary, fallopian tube, broad ligament) or masses rising from bowel, urinary system and retroperitoneum. Differential diagnosis is aided by taking into account

- History and Examination
 - The woman's age (high risk of malignancy in premenarchal and postmenopausal)
 - Family history of breast and ovarian malignancy
 - Personal or family history of TB
 - Menstrual and obstetric history
- Imaging studies
- Serum Markers
- Aspiration of unilocular cyst

Clinical Diagnosis & Investigations (Common to both situations 1 and 2)

Symptoms: Many cases may be asymptomatic or may present with any of the following:

- Abdominal pain, pelvic pain, dyspareunia
- Menstrual irregularities, menorrhagia, dyspareunia, postcoital bleeding
- Abdominal swelling (sometimes it is the first symptom), discomfort, bloating
- Acute pain, vomiting and low grade fever (torsion, rupture & ectopic)
- Pressure symptoms – retention of urine, frequency of micturition
- Dyspnoea, Palpitation (very large tumours)
- GIT symptoms – indigestion, loss of weight, loss of appetite
- Urinary symptoms – change in voiding habits, dysuria, hematuria

Signs:

- General physical – pallor, icterus, acne, hirsutism, lymphadenopathy
- Breast & Systemic examination
- Per abdomen Any visceromegaly, distended veins, ascites should be noted along with assessment of the abdominal mass: size, shape, surface (irregular, nodular), mobility, tenderness, and accessibility of lower limit. In case of adnexal mass its lower limit cannot be defined (except in small cyst with long pedicle).
- Per-vaginum: Uterus felt separately from mass in fornices, which may be unilateral or bilateral, may displace the uterus, movement of mass not transmitted to cervix; there may be nodules in the POD in malignancy/ tuberculosis/ endometriosis. Presence of a tense and tender adnexal mass, in a patient presenting as acute abdomen suggests adnexal torsion, whereas unilateral tender mass with cervical excitation pain raises the suspicion of ectopic pregnancy, and bilateral tenderness suggests PID.

- Per Rectal examination to evaluate the rectal mucosa & uterosacral ligaments which may show thickening or nodularity in endometriosis & ovarian malignancy.

Differential Diagnosis:

É Gynecological

- Functional ovarian cyst: Follicular cyst, Corpus luteum cyst
- Inflammatory mass: Tuboovarian abscess, Hydrosalpinx
- Others: Ectopic pregnancy, endometrioma, parovarian cyst, degenerated/pedunculated leiomyomata, mullerian anomaly
- Benign ovarian Tumors: Serous cystadenoma, Mucinous cystadenoma, Mature teratoma,
- Malignant ovarian: Germ cell tumor, Sex-cord or stromal tumor, Epithelial carcinoma

É Nongynecological

- **Benign:** Diverticular abscess, Appendiceal abscess or mucocele, Ureteral/bladder diverticulum, Pelvic kidney, Paratubal cysts
- **Malignant:** Gastrointestinal cancers, Retroperitoneal sarcomas, Metastases

Investigations:

É Hb, PCV, CBC & ESR; RFT, LFT

É Urine pregnancy test

É X-ray Chest, abdomen

É USG – abdomen & pelvis to study the characteristics of the mass such as volume, wall thickness, septal structure, echogenicity, papillary excrescences, free fluid in abdomen.

É Barium meal, enema, IVP (selected cases)

É Upper GI endoscopy, colonoscopy (selected cases)

É Tumour markers –

CA125 - epithelial ovarian tumour, cutoff 35 U/ml

CEA - GI tract tumour

β HCG - Chorio carcinoma

Inhibin - Granulosa cell tumour

LDH – Dysgerminoma

CA 19-9- Mucinous ovarian neoplasms

Alpha feto proteins- Endodermal Sinus Tumors

É Risk of Malignancy Index (RMI) screens for suspected ovarian cancer

RMI = CA-125 X USG Points X Menopausal status. Cut off level: 200

- Menopausal status (Premenopausal – score 1, Postmenopausal – score 3)

- Ultrasound Points: Score 0=0 point, Score 1=1 point & score 2-5 =3 points.

(1 point each for multilocular nature, solid areas, bilaterality metastasis, ascites,)

É Ascitic fluid cytology, FNAC of solid tumor has a questionable role

Situation 1: At Secondary Hospital / Non-Metro situation: Optimal Standards of Treatment in Situations where technology and resources are limited

REFERRAL OR CONSULTATION WITH A GYNECOLOGIC ONCOLOGIST

- Elevated CA-125
 - >200U/mL in <50 years/ premenopausal women
 - >35U/mL in > 50 years/ Postmenopausal women
- Ascites
- Evidence of abdominal or distant metastases

- Family history of breast or ovarian cancer in a first-degree relative
- Nodular or fixed pelvic mass (>50 years/ postmenopausal)

*** Situation 2: At Super Specialty Facility in Metro location where higher-end technology is available**

Investigations

- É Color Doppler if available may be used to study low resistance ovarian arterial flow; however, it does not significantly improve diagnostic accuracy.
- É **CT, MRI, PET may be done to evaluate the mass**

TREATMENT

Treatment depends on the diagnosis made after investigations. Patients with suspected malignancy should be referred to a higher center where facility for frozen section and services of a Gynecologic Oncologist and Medical Oncologist are available.

mass:

- Hydrosalpinx - usually asymptomatic. No intervention required.
- Abscess – pus is drained, antibiotics. Tuberculosis should be ruled out in our country.

Ectopic pregnancy:

Medical or surgical management as indicated (detailed in ectopic pregnancy chapter)

Endometrioma:

- Usually do not resolve with observation and require Surgery
 - ó Small: Electrocoagulation/ laser vaporization
 - ó Big: Removal with removal of cyst wall to prevent recurrence

Parovarian Cyst:

No intervention is necessary, unless large or risk for torsion or uncertain diagnosis

Mullerian Anomaly: Bicornuate uterus, uterus didelphys or bicornuate uterus with a communicating or non-communicating rudimentary uterine horn, can be identified by MRI & best surgical plan, as removal of accessory horn or metroplasty can be decided

Adnexal Torsion

In premenopausal patients on direct visualization if the ovary appears potentially viable, ovarian conservation can be done following de-torsion; whereas in patients with a non-viable ovary, suspected malignancy, or postmenopausal patients one should do salpingo-oophorectomy.

Ovarian cyst

Treatment of an adnexal mass is determined by age of pt & reproductive needs, morphology of lesion on USG/ CT/ MRI, presence of risk factors (postmenopausal, family history of ovarian/breast cancer, BRCA-1, 2 carriers, presence of ascites/ lymphadenopathy).

- Conservative Management:** Simple cyst in premenopausal woman:

- 2/3rd of these regress over 2-3 menstrual cycles. Therefore a ‘Wait and See’ policy is recommended for 8-10 wks. OCPs can be given for 3 cycles; however, there is no proven benefit. Aspiration of simple cyst not useful as it reoccurs in 75% within 1 yr.
- When one is almost certain regarding the benign nature of the cyst, a yearly follow up is required, until resolved, for a simple cyst of 5-7 cm in low risk patients & 2-7 cm in high risk patients; A cyst of >7cm needs further evaluation with MRI/Surgery

(b) Surgical Management is recommended for the following:

- A cyst with significant pain and other features suggestive of rupture/torsion
- Any ovarian mass >10cm
- Ovarian cystic structure >7cm without regression for 6-8wks
- Any solid ovarian lesion
- Papillary excrescences in wall
- Palpable adnexal mass in postmenopausal patients
- Presence of ascites

Surgery for Benign ovarian cyst

- É Ovarian cystectomy or Oophorectomy if the cyst cannot be removed separately from ovaries. Benign ovarian mass can be removed laparoscopically if:
- Surgical expertise skills appropriate for performing cystectomy or adnexectomy
 - Prompt and accurate frozen section services
 - Personnel and facilities available for timely surgical staging

Surgery where Malignancy is suspected

- Staging laparotomy has to be performed followed by histopathology and appropriate referrals for chemotherapy.
- É Staging Laparotomy for Ovarian Cancer
- Abdominopelvic exploration and taking Peritoneal washings from pelvis, bilateral paracolic gutters, and infradiaphragmatic areas
 - If desirous of fertility: Unilateral salpingo-oophorectomy
Biopsy of the contralateral ovary if it appears suspicious
 - If postmenopausal or does not desire fertility:
Bilateral salpingo-oophorectomy with total hysterectomy along with
Pelvic node and Para-aortic lymph node dissection, infracolic omentectomy and
Peritoneal biopsies from cul-de-sac, vesical peritoneum, bilateral pelvic sidewalls
and paracolic gutter and any additional suspicious areas

Special Situations:

1. Mass with borderline histology
In post menopausal woman – TAH with BSO
If fertility to be preserved – cystectomy
2. Young women – Germ cell tumours
Do unilateral adnexectomy and staging
Radical surgery after finishing childbirth
3. Adnexal masses in pregnancy: mostly cystic, resolve
There is a risk of torsion and rupture

16-18wks – ideal time for surgery

Caesarean Section

I. Incidence in our country:

10 to 50% depending on the level of care- whether a primary or tertiary referral center.

II. Introduction and case definition:

Caesarean section is a form of childbirth in which a surgical incision is made through a mother's abdomen and uterus to deliver one or more babies. The commonest uterine incision is the lower segment incision. It may be done electively or as an emergency procedure.

Optimal Investigations & Procedure (Common to both situations 1 and 2)

Clinical Diagnosis:

Common indications recognizable during the antenatal period that may require cesarean section are malpresentations, antepartum haemorrhage, previous caesarean section or surgery on the uterus, bad obstetric history, IUGR, induction of labour for pre eclampsia, gestational diabetes, postdatism, premature rupture of membranes, fetal macrosomia, and cephalopelvic disproportion.

Intrapartum indications include fetal distress, dysfunctional/ prolonged labour, malpresentations, obstructed labour and cord prolapse.

Pre-operative Investigations:

- Hb%, BT, CT, urine routine, blood grouping, cross matching and reservation of blood
- Ultrasound for presentation, placental position, biophysical profile.

Timing of Caesarean Section:

- Elective LSCS should be done preferably after 39 weeks to decrease neonatal morbidity.
- Emergency LSCS should be done within 30 minutes of decision if there is immediate threat to life of women or foetus.
- Emergency cesarean may be done up to 75 minutes when there is maternal or foetal compromise which is not life threatening.

Treatment: IV line and Oxygen inhalation,
Regional or general anaesthesia

Pre-operative:

- Informed Consent
- Prepare abdomen, perineum and back
- IV line to be established and bladder catheterisation
- Parenteral H2 blocker and antiemetic
- IV antibiotic to be given before skin incision (Avoid co-amoxyclav)

Operative details:

- Abdominal incision could be transverse suprapubic or vertical.
- The uterine incision is usually transverse in the lower segment, midline vertical (Classical) may be indicated occasionally if lower segment is unapproachable due to dense adhesions.
- Baby is extracted, cord clamped, cut and baby handed over to the paediatrician. Cord blood should be collected in Rh isoimmunisation cases. Placenta with entire membranes removed by controlled cord traction. Oxytocics administered to contract the uterus and prevent post partum haemorrhage. Uterus sutured with absorbable sutures to secure haemostasis in two layers. No need of suturing the peritoneum. Uterus should not be exteriorised routinely. Surgical mops and instrument count to be checked. Abdominal wall closed in layers.

Post operative:

- Vitals, urine output, and bleeding are monitored,
- IV fluids, antibiotics and pain medication given,
- DVT prophylaxis advised if indicated,
- Oral feeds encouraged with return of bowel sounds after 8 hours.
- Early breast feeding and ambulation encouraged.

Situation 1: At Secondary Hospital/ Non-metro situation: Optimal Standards of treatment in situations where technology and resources are limited.

Cases warranting immediate delivery to save the life of baby or mother should be dealt with. In situations where skilled manpower and technology is not available, woman may be referred to higher institution.

Situation 2: At super-specialty facility in metro location where higher end technology is available.

Referral criteria: Situations warranting neonatal intensive care management facilities, need for blood and blood component therapy, special anaesthesia services like epidural analgesia; For the management of post operative complications of caesarean section like sepsis, secondary haemorrhage, wound dehiscence, acute renal failure etc where multidisciplinary input is warranted need to be tackled at super-specialty level.

Additional Investigations that may be required:

- Ultrasound Doppler studies in IUGR
- Electronic fetal monitoring in labour
- TSH, LFT, RFT, Coagulation profile tailored to the needs of the patient.

Further Reading/ References:

- RCOG Guidelines
- Williams text book of Obstetrics

Resources required for one patient/procedure

Situation	Human resources	Investigations	Drugs and consumables	Equipment
1	Obstetrician Anaesthetist Nurse Floor nurse House keeping	Written above	parenteral H2 blocker antiemetic IV antibiotic oxytocin	Boyles OT table with lateral tilt of 15 degree or wedge Light Section tray Suction apparatus Baby Warmer electrocautery
2	Senior obstetrician Junior doctor Consultant Anesthetist Nurses x2 floor Nurse OT technician Senior Hematologist Experienced pediatrician		Other Drugs as per individual patient	Boyles Ot table Light Section tray Suction apparatus Baby Warmer Electrocautery Critical care bed

Hypertension in pregnancy/Preeclampsia

WHEN TO SUSPECT OR RECOGNIZE

Definition: -when high blood pressure is noted during pregnancy, it may be one of the following:

- **Gestational Hypertension:** new onset BP elevation of systolic $>140\text{mmHg}$ / diastolic $>90\text{mmHg}$ on 2 occasions 6 hrs apart after 20 wks gestation in a previously normotensive woman
- **Preeclampsia** - gestational hypertension and persistent proteinuria $\geq 1+$ on dipstick urine analysis or $>300\text{mg}/24\text{ hours}$ occurring >20 weeks pregnancy in a previously normotensive, non proteinuric woman. Oedema is not a defining sign of PE.
- **Eclampsia** - Generalized convulsions occurring after the 20th week of pregnancy in a patient with underlying pre-eclampsia

Incidence: 2-8%

A higher incidence is seen in women with age ≥ 40 , nulliparity, family or prior pregnancy h/o PIH, past h/o diabetes mellitus, chronic hypertension, renal disease, antiphospholipid syndrome, and present pregnancy with multifetal gestation and vesicular mole.

Complications

If not recognized and managed appropriately, preeclampsia can result in complications such as eclampsia, hypertensive encephalopathy, pulmonary edema, liver haematoma/rupture, renal failure, ARDS, HELLP syndrome, disseminated intravascular coagulation, cortical blindness.

Prediction

In situation 1

Roll over test at 28 -30 wks: increased blood pressure of 20mmHg when patient rolls over from lateral to supine position means a positive test. The test has a high negative predictive value although the positive predictive value is low.

In situation 2

If the facility for colour doppler is available it can be performed at 24-26 weeks: Persistence of diastolic notching in uterine artery after second trimester can be predictive of preeclampsia.

Prevention

Low dose Aspirin (50-100mg/d) may reduce the risk of PE by 15%. It can be started in high risk at 20 weeks and has to be stopped at 34 weeks gestation.

OPTIMAL DIAGNOSTIC CRITERIA, INVESTIGATIONS, TREATMENT & REFERRAL CRITERIA

***Situation 1: Optimal Standards in Situations where technology and resources are limited**

PHC

The patient should be transferred to higher centre as soon as a diagnosis of preeclampsia is made. However, if the patient presents with eclampsia/impending eclampsia, she should be started on MgSO4 and anti hypertensive (described later) and transferred after stabilizing.

Non-Metro situations

Patient should be hospitalized and evaluated in detail to assess the severity of disease, gestational age, maternal and fetal well being:

History:

- Present illness - symptoms of impending eclampsia
- Past- diabetes mellitus, chronic hypertension, renal disease, antiphospholipid syndrome
- Family - hypertension, diabetes mellitus
- Obstetric - h/o PE in previous pregnancy, preterm birth, IUGR, stillbirth or neonatal death

Examination:

Complete general physical and systemic examination should be carried out including record of maternal weight, BMI, pulse, B.P in all four limbs, and testing of limb reflexes (presence of hyper-reflexia indicates impending eclampsia).

Obstetric Examination:

Assess for presentation, fetal heart rate, estimated fetal weight, IUGR and accidental hemorrhage in severe cases. Per-vaginal examination may be done if patient is complaining of pain abdomen, or if termination of pregnancy is decided.

Investigations:

- CBC, hematocrit, platelets, P/S for haemolysis
- Serum uric Acid, creatinine, blood urea
- S. Bilirubin, SGOT, SGPT, LDH
- Urine R/E, M/E, C&S*
- Total urinary protein excretion on 24-hr specimen*

- Fundoscopy

Diagnosis of severe preeclampsia is made if any of the following is present:

- SBP > 160 or DBP 110 mm Hg on 2 occasions six hours apart
- Proteinuria > 2+ or > 5 gms/ 24 hours
- Oliguria (urine output< 400 ml/24 hours)
- Signs and Symptoms of impending eclampsia
(Nausea, vomiting, persistent headache, epigastric pain, visual disturbances)
- Placental abruption, IUGR
- Platelets< 100,000 /cubic mm
- Micro angiopathic hemolysis (increased LDH)
- Elevated liver enzymes (SGOT > 70 IU/ L)
- Serum Creatinine> 1.2 mg % unless previously elevated

Referral Criteria - All cases of severe PE and threatened eclampsia should be referred to situation 2 following the initial management and stabilization, as the clinical course of these patients is unpredictable and may necessitate maternal and fetal intensive care and monitoring.

***Situation 2: At Super Specialty Facility in Metro location where higher-end technology is available**

Hospitalization:

Mild – Hospitalization is advised although complete bed rest is not advisable.

Severe- Immediate hospitalization is recommended if BP ≥ 160/100 or alarm signs.

Maternal Assessment:

- É Blood pressure measurement: At least 4 times a day, more often in severe cases
- É Urine quantification (24 hour protein) on admission, repeat not required
- É Blood tests: Monitor kidney function, electrolytes, full blood count, transaminases, bilirubin twice a week in mild preeclampsia and thrice a week in severe preeclampsia

Fetal Assessment:

The following tests should be carried out at diagnosis:

- Cardiotocography
- Ultrasound for fetal growth and amniotic fluid volume assessment
- Umbilical artery doppler velocimetry.

If the results of all fetal monitoring are normal, cardiotocography need not be repeated more than weekly unless if there is deterioration in maternal condition, vaginal

bleeding, abdominal pain, or reduced fetal movement. Repeat ultrasound for fetal growth, amniotic fluid volume assessment or umbilical artery doppler velocimetry is also not required more than every 2 weeks.

Diet should be adequate in proteins; salt restriction is not advised in Preeclampsia.

Antihypertensive Therapy:

It can be initiated if DBP >100mmHg. Lower threshold may be considered if disease has arisen before 28 wks. Aim is to keep DBP between 80–100 mmHg, and SBP less than 150 mmHg. In mild PE, it reduces the occurrence of severe hypertension, but there is no benefit in terms of maternal & fetal outcome. In severe hypertension therapy is mandatory to reduce the risk of CVA.

- É Tab. Methydopa -250- 500 mg 3-4 times /day.
- É Tab. Labetalol-100-200 mg 2-3 /day..
- É Labetalol: IV regimen: 20 mg stat. If DBP>110 after 20 min, give 40mg; ↑ to 80 mg & then 80 mg to a total of 220mg. If no response, discuss with senior physicians and anaesthetists.
- É Use of ACE inhibitors is contraindicated in pregnant woman
- É Nitroglycerine (NTG) drip may be useful in hypertensive crisis: Dose - 50mg in 500ml 5%dextrose, start at 10ml/h, ↑ by 5ml every 10-15' till SBP ≈140mmHg

Anticonvulsants

Consider giving intravenous magnesium sulphate to women with severe pre-eclampsia who are in a critical care setting if birth is planned within 24 hours.

Termination of Pregnancy:

Mild to moderate PE: Terminate at 34+0 to 36+6 weeks depending on maternal and fetal condition, risk factors and availability of neonatal intensive care.

Severe PE: Terminate at 34 weeks. Induction before 34 weeks may be indicated if:

- severe hypertension develops refractory to treatment
- maternal or fetal indications of worsening condition

Corticosteroid for Lung Maturity

Two doses of betamethasone 12 mg IM 24 hours apart are recommended between 24-36 weeks.

Intrapartum care In women with severe pre-eclampsia

- É Accurate recording of fluid balance (including delivery and postpartum blood loss, Intake/output chart) and Maintenance crystalloid infusion - 85 ml/hour, or urinary

output in preceding hour plus 30 ml. Diuretics and CVP monitoring may be required if pulmonary oedema is suspected.

- É Measure blood pressure, hourly in women with mild or moderate hypertension and continually in women with severe hypertension. Continue use of antihypertensive treatment during labour.
- É Do not routinely limit the duration of the second stage of labour in women with stable mild or moderate hypertension or if blood pressure is controlled within target ranges in women with severe hypertension. Operative birth is recommended in the second stage of labour if severe hypertension has not responded to initial treatment
- É Use of Methergine is contraindicated for active management of 3rd stage.

Ceasarean Section is indicated for severe IUGR/ primi remote from term with unfavorable cervix, for fetal distress or other obstetric indications. Thrombo prophylaxis to be considered in severe PIH.

Analgesia & Anesthesia Issues:

- É GA Risks: - Aspiration, laryngeal edema, difficult intubation, pulmonary edema/ arrhythmias precipitated by pressor response to intubation, neuro-muscular blockade effect of mag sulf.
- É Continuous lumbar epidural preferred method of pain relief as well as for cesarean section provided there is no coagulopathy and platelet count is > 50,000/cu mm.
- É Need adequate pre-hydration of 1000 cc, Level should be advanced slowly to avoid low BP

Postpartum Care

Women with PE who did not require anti-hypertensives: Measure BP at least four times a day while the woman is an inpatient, at least once between day 3 and day 5 after birth, and on alternate days thereafter until normal. Ask about severe headache and epigastric pain each time blood pressure is measured. Start antihypertensive treatment if blood pressure is $\geq 150/100$ mmHg.

Women with PE who took antihypertensive treatment: Measure BP at least four times a day while the woman is an inpatient and every 1–2 days for up to 2 weeks after transfer to community care. Continue antenatal antihypertensive treatment, and reduce it if BP falls below 130/80 mmHg. If a woman has taken methyldopa to treat pre-eclampsia, stop within 2 days of birth, measure platelet count, transaminases and serum creatinine 48–72 hours after birth.

Discharge the women when there are no symptoms of pre-eclampsia, BP is $\leq 149/99$ mmHg, with or without treatment, and blood test results are stable or improving.

All women who have had pre-eclampsia should have a medical review 6–8 weeks after birth to detect those women who still need antihypertensive treatment. Women who continue to have proteinuria ($\geq 1+$) a further review is required after 3 months to assess kidney function. Specific investigations like aPLa, LAC and thrombophilia screen may be needed.

Eclampsia

Generalized convulsions occurring after the 20th week of pregnancy with underlying pre-eclampsia

Incidence

Antepartum 40%, Intrapartum 20%, Postpartum 40%. Although seizures may occur as long as 3 weeks postpartum, majority of cases (98%) occur on the first day.

All cases of eclampsia are best managed at situation 2 or 3.

If a woman with eclampsia is seen at situation 1, she should be stabilized with Magsulph and antihypertensives and transferred to higher centre only when stable and with full life support system, to limit maternal and fetal morbidity.

Immediate care is needed with airway support, adequate oxygenation, anticonvulsant therapy, and BP control. Delivery of neonate is the only definitive treatment, with Intensive postpartum care.

General Measures:

- É Do not leave patient alone
- É Call for help and inform consultants - obstetrician & anesthetist on call
- É Prevent maternal injury: Place in semi-prone position, guardrails on the bed, padded tongue blade b/w teeth.
- É Airway: Maintain patency, start oxygen inhalation, suction of mouth secretions.
- É Breathing: Assess, Ventilate as required.
- É Circulation: Left lateral tilt, If pulse, BP absent, initiate CPR, call ICU
- É After the seizure has ended, a 16- to 18-gauge IV line should be obtained for drawing specimens for laboratory studies and administering fluids
- É Attach ECG, automatic BP monitors, pulse oximeter
- É Indwelling Urinary catheter - Fluid input / output chart

Treatment and prophylaxis of seizures:

Magnesium sulphate is the anticonvulsant drug of choice. After ABC:

- É **Loading Dose:** 4 g IV over 10-15 minutes

Prepared by adding 8 ml of 50% MgSO₄ solution to 12 ml of N Saline/ 20 ml of 20% solution

- **Maintainance Dose:**

MgSO₄ (50% solution) + 1ml Lidocaine 2% given IM every 4 hrs into alternate buttock

- **Monitor the following parameters before giving a repeat dose**
 - respiratory rate > 16 breaths/minute
 - urine output > 25 ml/hour, and
 - patellar reflexes are present
- É Remember to subtract volume infused from total maintenance infusion volume (85 ml/hour)
- É A higher maintenance dose may be required initially to prevent recurrent seizures - consultant must make this decision
- É If seizure continues, or if seizures recur, give a second bolus of magnesium sulphate: 2-4 g depending on weight of patient, over 5-10 minutes (2 g if < 70 kg and 4 g if > 70 kg)
- É If seizures continue despite a further bolus of Mg sulphate, Diazepam (10 mg IV) or thiopentone (50 mg IV) can be given. Intubation may become necessary in such women. Further seizures to be managed by IPPV & muscle relaxation.

Magnesium Toxicity:

- É **If urine output < 100 ml** in 4 hours withhold Magsulph and review overall management with attention to fluid balance and blood loss
- É **Absent patellar reflexes:** Stop MgSO₄ infusion until reflexes return
- É **Respiratory depression:** Stop MgSO₄ infusion, Give oxygen via facemask and place in recovery position and Monitor closely
- É **Respiratory arrest:**
Stop MgSO₄ infusion, Give Calcium gluconate (10 ml slow IV), Intubate and ventilate.
- É **Cardiac arrest:**
Commence CPR, Stop MgSO₄ infusion, Give IV Calcium gluconate*, Intubate and ventilate; If antenatal, immediate delivery

Other Anticonvulsant Drugs

- É **Phenytoin**
 - 20 mg/kg diluted in 100ml saline infused at maximum rate of 50 mg/min IV over 15-20mts followed by 100mg IV 8 hrly. It may cause hypotension, arrhythmias, local phlebitis, and requires ECG monitoring
- É **Diazepam**
 - 10 mg IV at a rate of 1mg/min. It can cause maternal sedation, fetal respiratory depression, hypotonia and ↓ beat-to-beat fetal heart variability

Treatment of Hypertension :

- É Reduction of severe hypertension is mandatory to reduce the risk of CVA & further seizures.
- É Insufficient evidence to recommend one antihypertensive in preference to another and so the choice of which drug to use should depend on personal preference and availability.
- É Labetalol (20mg IV ↑ to 40 and 80mg every 20' to max. 220mg)
 - It may precipitate fetal distress, thereby necessitates continuous fetal heart rate monitoring.
- É NTG drip (5µg/m iv infusion, ↑to max 100µg/m)

Fluid therapy:

- É Close monitoring of fluid intake and urine output is mandatory. Fluid therapy should be limited to maintenance crystalloid (85ml/h or urine output in preceding hour plus 30ml) to avoid tissue overload, pulmonary edema & ARDS. Colloids remain in vascular tree and unless used carefully can cause circulatory overload.

Antibiotics:

Inj. Ampicillin 500 mg x 6hrly IV to prevent infection

Associated Complications:

HELLP syndrome (3%), Disseminated intravascular coagulation (3%), renal failure (4%), ARDS (3%)

Differential Diagnosis -

- É Cerebral tumors, Cerebral venous thrombosis, Intracranial hemorrhage
- É Drug overdoses, Electrolyte imbalance
- É Epilepsy, head trauma, Stroke (ischemic/ non-ischemic)

Monitoring:

- É Record BP every 10 minutes. Reduce DBP to 90-100 mm Hg with antihypertensive medication
- É Auscultate lungs for aspiration after convulsion ended
- É Monitor the neurologic status, urine output, respirations, and fetal status

Laboratory workup:

- É CBC, RFT, LFT, Electrolytes, Glucose, PLT, Coagulation profile
- É Urinalysis for proteinuria
- É Blood gases & Invasive PCWP monitoring may be necessary for accurate fluid management in patients with pulmonary edema or anuria
- É USG abdomen may be used to rule out abruptio placentae
- É CT scan/ MRI if focal neurological deficits or prolonged coma

Delivery :

- É The definitive treatment of eclampsia is delivery.
- É Attempts to prolong pregnancy in order to improve fetal maturity are unlikely to be of value.
- É However, it is inappropriate to deliver an unstable mother even if there is fetal distress.
- É Once seizures are controlled, severe hypertension treated, and hypoxia corrected, delivery can be expedited.
- É Vaginal delivery should be considered but caesarean section is likely to be required in primigravidae remote from term with an unfavourable cervix/deteriorating maternal or fetal condition
- É After delivery, high dependency care should be continued for a minimum of 24 hours.

During Post partum period :

- É Mag sulf for 24 hrs after delivery or after last fit whichever is later
- É Continue Vital monitoring, antihypertensives, antibiotics
- É Counsel about next pregnancy

Can it be prevented?

Vigilant ANC & a well-timed delivery may prevent eclampsia, and Magnesium is routinely given to women with severe PE in the expectation that it prevents progression to eclampsia, but fits which occur without warning may be impossible to prevent.

PELVIC ORGAN PROLAPSE

INTRODUCTION

Genital prolapse is a common gynecological operative problem. It can occur at any age, but is more common in multipara as a result of injury to pelvic floor muscles and fascia during childbirth and age related estrogen deficiency in postmenopausal women. In young age and nulliparous women it may be related to collagen deficiency or congenital elongation of cervix.

DEFINITION:

Pelvic organ prolapse is the downward displacement of one of the pelvic organs from its normal location. All forms of prolapse are described in relation to the vagina:

Anterior compartment prolapse

- Cystocele: involves proximal 2/3rd of anterior vaginal wall with descent of bladder
- Urethrocele: involves distal 1/3rd of anterior vaginal wall with descent of the urethra

Posterior compartment prolapse

- Rectocele: involves proximal 2/3rd of posterior vaginal wall with descent of rectum
- Perineal Descent: Defect in perineal body

Central compartment/Apical Prolapse

- Uterine prolapse: descent of the uterus and the vagina along with it
- Vault prolapse: descent of the vaginal apex
- Enterocele: herniation of small bowel loops along with descent of pouch of douglas

WHEN TO SUSPECT/RECOGNISE:

The following history should arouse a suspicion of pelvic organ prolapse:

- Vaginal bulge/ Protrusion
 - Reducible//irreducible
- Pelvic discomfort:
 - weakness perineal region/ dragging- bearing down sensation
 - low back ache relieved by lying down
- urinary symptoms:
 - Stress incontinence
 - Frequency/ urgency/ nocturia
 - urinary retention/ incomplete voiding
- Defecation problems

- Difficulty in emptying rectum, tenesmus, splinting
- Incomplete evacuation of the faeces
- Fecal Incontinence
- Sexual Function/ dyspareunia
- Vaginal discharge - leucorrhoea, blood stained discharge

Systemic symptoms of precipitating diseases such as chronic bronchitis, asthma, constipation, abdominal mass, ascites etc. should be asked for.

EXAMINATION OF THE PATIENT

General Physical examination

- É BMI
- É Gait
- É Spine examination to rule out neurological and anatomical defect

Abdominal examination

- É mass per abdomen/free fluid, organomegaly, hernial sites

Neurological examination (S2-4)

- É Bulbocavernous / anal wink reflex

Local examination

Patient should be asked to hold urine to demonstrate SUI, and examination can be made in dorsal lithotomy/standing position depending upon the prolapse severity

- É Perineum: scar/s, introital laxity
- É Prolapsed part: location, ulceration, growth, pigmentation, keratinization,
- É Rugosities, sulci

Per-speculum (P/S) Examination

- É Ask the patient to strain and visualise the entire prolapse
- É Note the type and degree of prolapse in all segments (anterior, posterior, central)
- É In anterior segment prolapse, differentiate if it is paravaginal/ central
- É Check for cervical changes
 - elongation and hypertrophy of cervix, atrophy
 - decubitus ulcer
 - keratinisation
 - discharge – colour/blood stained
- É Measure the size of introitus and utero-cervical length

Per-vaginum (P/V) Examination

- É The prolapsed part is reduced and bimanual examination performed
- É Uterus size , mobility any other palpable mass is noted

- É Tone of levator ani and Integrity of perineal body is noted
- É Occult SUI observed if any

Rectovaginal examination

- É Help differentiate between enterocoele and rectocele

DIFFERENTIAL DIAGNOSIS

- Local mass/ cysts arising from vagina, Gartner's cyst
 - Fibroid polyp
 - Chronic inversion of uterus

SITUATION 1 (Non-metro with limited resources)

DIAGNOSIS

- Diagnosis is clinical, confirmed by P/S, P/V, and rectovaginal examination.

INVESTIGATIONS

Routine Investigations

1. CBC, blood grouping and RH typing
2. FBS, PPBS
3. Blood urea, serum creatinine
4. ECG, chest X-ray
5. Urine- R/M and C/S

Special Investigations

1. USG of abdomen and pelvis to rule out associated pelvic pathology and renal problems due to pressure effect on ureter
2. Papanicolou smear
3. Endometrial aspiration and ECC (if abnormal uterine bleeding)
4. Cervical or ulcer biopsy is done when malignancy is suspected
5. IVP – where kinking of ureter is suspected in long standing cases and residual volume of urine is more than 100 ml

TREATMENT APPROACH

1. Non-surgical Management
 - a. Physiotherapy
 - b. Vaginal Pessaries
2. Surgical

PHYSIOTHERAPY

- Useful in minor degrees of uterovaginal prolapse
- During 6 months following delivery

- É PFMT (Pelvic Floor Muscle Training) - Kegel's exercise – Patient is taught to voluntarily contract the levator ani muscle and external anal sphincters and hold for 5 seconds each, 15-20 times per session, three sessions a day.
- É Vaginal cones of successively increasing weights 20 to 100 gms can be used to hold inside for 15 minutes.

PESSARY TREATMENT

It is non-surgical and palliative and can be used in following situations:

- É Patients awaiting surgery/ to help healing of decubitus ulcer
- É Associated medical disorders contraindicating surgery
- É Refusal of surgery
- É Pregnancy

Types of pessary: depending on availability one can use

- É Support pessaries (Ring, Hodge)
- É Space occupying type (Donut, Gelhorn)

SURGERY

Indications of Surgery

- É Stage I & II prolapse, if symptomatic e.g.,
 - ó Small cystocele with significant SUI
 - ó Constant dragging sensation due to cervical descent
 - ó Small rectocele with definite pocket on P/R and splinting is required by the patient to defecate
- É Stage III/ IV prolapse even if asymptomatic
 - ó As risk of generally obstructive voiding leading to post void residual urine and recurrent UTI
 - ó Ureteral kinking and dilatation may lead to impaired renal function

Pre Operative Preparation

1. Vaginal tampons to reduce the prolapse and replace the organ back. It helps to prevent kinking of ureter and congestion of organs and increase the blood flow.
2. Estrogens (oral/local) if atrophic vagina
3. Correction of anemia if present
4. Treatment of UTI if present
5. Treat diabetes and hypertension if present
6. Treat other systemic infection if present
7. Enema (bowel evacuation night before surgery)
8. Prophylactic antibiotics

Factors determining the choice of surgery

Type of operation selected depend upon

- É Age
- É Life style
- É Which symptoms and related pelvic floor disorders are most bothersome for her
- É Patients desire to preserve menstrual and reproductive function
- É Her desire to have sexual function
- É Her preferred route of surgical access
- É Degree, type, and components of prolapse
- É Co-existing adnexal/ uterine pathology eg. TO mass, myomas, ovarian tumors
- É Coexisting medical and surgical conditions
- É Previous history of pelvic surgery

Surgical Options

Anterior Compartment Defect:

- Anterior colporraphy
- Para vaginal repair

Posterior Compartment Defect:

- Posterior colporraphy and colpopерineorraphy
- Site-specific repair of posterior vaginal wall defects

Central Compartment Defect: Choice of operations in this defect is varied:

Vaginal

- Fothergill's repair and Shirodker's modification of Fothergill
- Posterior culdoplasty and vault suspension with or without vaginal hysterectomy
- Sacrospinous fixation with or without vaginal hysterectomy
- Colpocleisis if patient does not desire coital function

Abdominal

- Abdominal sling operations (Shirodker, Purandre)
- Abdominal Colposacropexy with or without Hysterectomy

REFERRAL CRITERIA

Patients with following high risk factors should be referred to higher centers:

1. Previous history of pelvic surgery
2. Presence of urinary or fecal incontinence
3. Presence of urethral hypermobility
4. Presence of pelvic floor neuropathy
5. Co morbid medical conditions

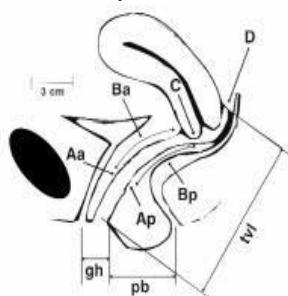
SITUATION 2 (Metro situations where advance technology is available)

DIAGNOSIS

Diagnosis of POP can be made as in situation 1.

However, a Pelvic Organ Prolapse Quantification (POPQ) system can be used to quantify prolapse to have a uniform internationally used terminology. This system quantifies prolapsed based on the topographic position of six defined vaginal points: 2 anterior, 2 apical & 2 posterior with measurements of Genital Hiatus (GH), Perineal Body (PB), and Total Vaginal Length (TVL). It is a useful tool to enhance communication among clinicians/ researchers, to follow objectively changes in an individual patient over time, and to assess the success and durability of various surgical and non-surgical treatments.

Pelvic Organ Prolapse Quantification (POPQ)



Aa	Ba	C
Gh	Pb	TVL
Ap	Bp	D

Aa . on anterior vaginal wall,
3cm proximal to the
external urethral meatus

Ba - most distal part of the
anterior vaginal wall

C - most distal part of the
cervix or vaginal vault

D - the posterior fornix, if the
cervix is present.

Ap - on posterior vaginal wall
3cm proximal to the hymen

Bp - most distal part of the
posterior vaginal wall

INVESTIGATION

Tertiary centres can use imaging procedures like cystourethrography, perineal ultrasound, MRI studies, pelvic neuro-muscle physiology testing with concentric needle/

single fibre electromyography, if available, for identification of discrete fascial defects to plan appropriate surgical strategy.

TREATMENT

Tertiary centers can use

- Laparoscopic approach for
 - vaginal vault suspension
 - paravaginal repairs
- Mesh augmented prolapsed repair in following situations:
 - Nonexistent or suboptimal autologous tissue
 - Need to augment weak or absent endopelvic tissue
 - Connective tissue disorder
 - Unavoidable stress on the repair (eg, chronic lifting, chronic obstructive pulmonary disease, chronic straining to defecate, obesity)
 - Need to bridge a space such as sacral colpopexy
 - Concern about vaginal length or caliber
 - Denervated pelvic floor
 - Recurrent prolapse