1 Chapter

Objective Structured Clinical Examination in Obstetrics

CASE 1: SEVERE PRE-ECLAMPSIA

Case Summary

Mrs CR in her first pregnancy was admitted with the diagnosis of severe pre-eclampsia. Complete hemogram revealed Hb of 9.8 g/dL, which was 11.6 g/dL 1 week ago. LFT revealed AST = 150 IU/L, ALT = 200 IU/L, alkaline phosphatase = 180 IU/L and LDH = 1,000 IU/L. Platelet count was 85,000/mL.

Q.1 What is the probable diagnosis?

Ans. Hemolysis, Elevated Liver enzymes, Low Platelet count (HELLP) syndrome.

Q.2 How do you diagnose it?

Ans. Presence of hemolysis, elevated liver enzymes and low platelet count in a patient with severe pre-eclampsia.

Q.3 What do you understand by severe pre-eclampsia?

Ans. Severe pre-eclampsia includes:

- BP: > 160 mm Hg systolic or > 110 mm Hg diastolic
- Proteinuria: > 5 g/24 hours
- Onset of acute renal failure
- Oliguria: Urine < 500 mL/24 hours
- Liver enzymes: > 2 times the normal
- Serum creatinine: > 1.1 mg/dL
- Urinary protein: Creatinine ratio: > 0.3
- Pulmonary edema
- HELLP syndrome
- Thrombocytopenia (< 100,000/μL)
- Symptoms due to end organ involvement—headache, epigastric pain, visual disturbances
- Fetal growth restriction.

Q.4 What is the diagnostic criteria for HELLP syndrome?

Ans. The diagnostic criteria include:

- Hemolysis
- LDH > 600 IU/L
- AST > 70 IU/L
- ALT > 70 IU/L
- Platelets < 100,000/mm^3
- Serum bilirubin > 1.2 mg/dL
- Abnormal peripheral blood smear (schistocytes).

Q.5 What other investigations should be done for her?

Ans. Other investigations should be done are—coagulation profile, serum uric acid, creatinine, urine analysis and ophthalmoscopy.

Q.6 What is the risk of eclampsia in HELLP syndrome when compared to severe pre-eclampsia?

Ans. Eclampsia is more common in HELLP syndrome in comparison to severe pre-eclampsia.

Q.7 What would be the appropriate management of the case?

Ans. Patient should be managed in a tertiary care center:

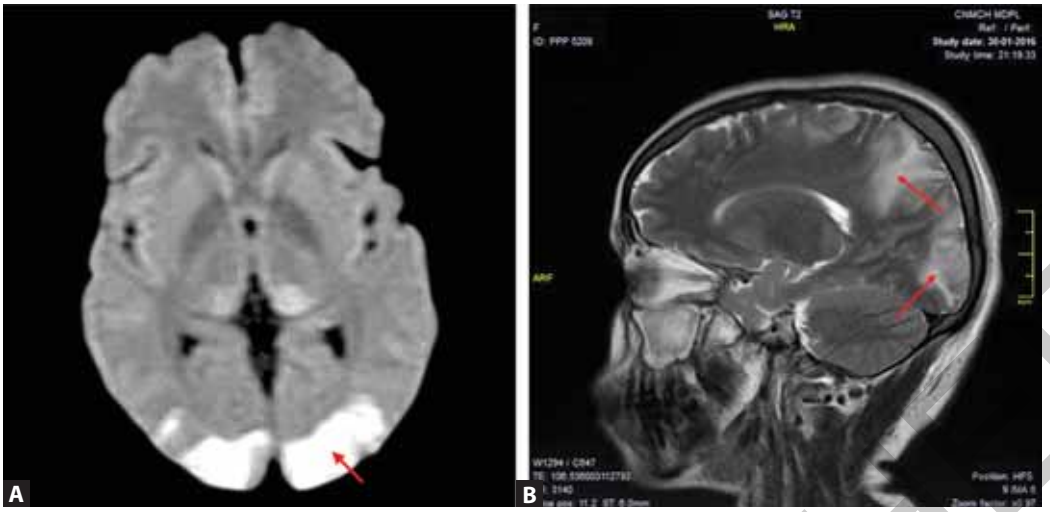
- ***To stabilize maternal condition***
  - Antihypertensive therapy—hydralazine 5 mg IV bolus to be followed by infusion (25 mg in 200 mL normal saline) at the rate of 2.5 mg/hour to be doubled every 30 minutes till the diastolic BP is < 110 mm Hg. Labetalol IV (200 mg in 200 mL of normal saline) at the rate of 20 mg/hour can also be used as an alternative.
  - Antiseizure prophylaxis with $MgSO_4$ (IM or IV regimen).
  - CT or USG of abdomen if subcapsular hematoma of liver is suspected.
  - To correct coagulopathy if any: Fresh (relatively) whole blood transfusion, platelet transfusion if count is < 10,000 mm^3.
- ***To evaluate fetal wellbeing***
  - Nonstress test
  - Biophysical profile
  - Doppler flow study of umbilical artery.
- ***Termination of pregnancy (delivery)***
  - Pregnancy > 34 wks → corticosteroid therapy → delivery
  - Pregnancy < 34 wks → corticosteroid therapy → delivery

Q.8 What is posterior reversible encephalopathy syndrome (PRES)?

Ans. Cerebral changes in severe pre-eclampsia and eclampsia have been demonstrated with many neurodiagnostic tests including MRI, cerebral Doppler velocimetry and cerebral angiography (Figs. 1.1A and B). Cerebral pathology in eclampsia is mainly due to ***loss of cerebral autoregulation***. Important findings on MRI are:

- Hypodense areas of diffuse white matter
- Loss of normal cortical sulci
- Cerebral infarction (low attenuation)
- Edema of the occipital lobe
- Cerebral hemorrhage (high density area)
- Acute hydrocephalus.

Posterior reversible encephalopathy syndrome is similar to hypertensive encephalopathy. It is due to reversible cerebral vasoconstriction. Such lesions



Figs. 1.1A and B: MRI of the brain axial and sagittal views showing posterior reversible encephalopathy syndrome (PRES) in a patient with eclampsia. Massive areas of the occipital and parietal lobes show infarction and vasogenic edema. T2 flair lesions are seen (*see* arrows).

may also be seen in frontal lobes, temporal lobes, basal ganglia and thalamus. Occipital lobe edema may cause blindness, although reversible lesions due to cerebral infarctions may show persistent pathology.

CASE 2: COUNSELING

Case Summary

Mrs AK, 26-year-old, married for 1 year is planning to have a baby. She has come to you for counseling about pre-eclampsia. She came to know about the problems of high blood pressure and convulsions during pregnancy, while she was reading the 'Women's Health' magazine.

Q.9 What are the predisposing factors for pre-eclampsia?

Ans.
- Young and elderly primigravidae
- Positive family history (genetic)
- Pregnancy complications—multiple pregnancy, diabetes
- New paternity
- Many others (genetic and immunological).

Q.10 Can you predict pre-eclampsia?

Ans. There are many screening methods. Doppler study (Fig. 1.2) to detect 'notch' in the early diastole wave especially in the uterine arteries, at 24 weeks of gestation can predict the possible development of pre-eclampsia. Other tests like ***Roll over test*** and ***Angiotensin infusion test*** have been tried. Unfortunately, positive predictive value of all these tests is poor.

Q.11 Can you prevent pre-eclampsia?

Ans. Pre-eclampsia is not a totally preventable disease. Use of low-dose aspirin, calcium, antioxidants (vitamins C and E) have been tried in the high-risk groups to reduce the onset of severe disease.

Q.12 Can you predict and prevent eclampsia?

Ans. Eclampsia may present in atypical ways though in majority it is preceded by severe pre-eclampsia. So, effective management of pre-eclampsia is the only way to prevent eclampsia.

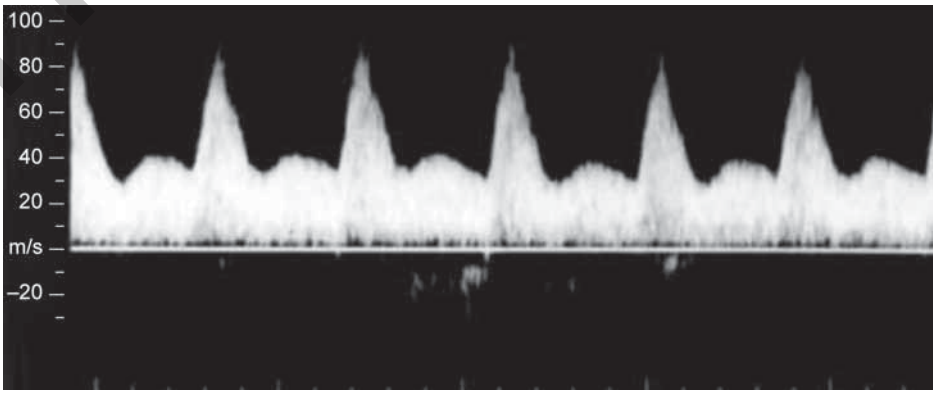


Fig. 1.2: Flow velocity waveform (Doppler velocimetry) of the uterine artery at 26 weeks of gestation. This shows early diastole 'notch'. Presence of this notch and elevated resistive index (RI) or pulsatility index (PI) at advanced weeks of gestation indicate high uterine vascular resistance and reduced placental blood flow. This is thought to be due to failure of trophoblastic invasion of the spiral arteries.

CASE 3: ECTOPIC PREGNANCY

Case Summary

Mrs NS, 26-year-old nurse, $P_{1+0+1+1}$ was seen in the outpatient clinic for the lower abdominal pain and irregular vaginal bleeding. It is nearly 6 weeks that she had her last menstrual period (LMP). On clinical examination, she was hemodynamically stable and there was some discomfort on pelvic examination (Fig. 1.3).

Q.13 What are the most likely diagnoses?

Ans. Complications (bleeding) of early pregnancy—threatened or incomplete miscarriage and ectopic pregnancy.

Q.14 What investigations you will recommend?

Ans. Urine for hCG and pelvic ultrasonography [transvaginal scan (TVS)].

***Investigation* report**

Urine hCG = positive; serum β-hCG = 1,850 IU/L; pelvic ultrasonography—Uterus: NS; cavity: empty. Mass in the right adnexae; no fluid in the pouch of Douglas (POD), left tube and ovary—not visualized (Fig. 1.3).

Q.15 What would be your next step of management?

Ans. Diagnostic laparoscopy—double puncture procedure.

On laparoscopy—pathology revealed as shown in Figure 1.4.

Q.16 What is your diagnosis?

Ans. Unruptured tubal ectopic pregnancy.

Q.17 Mention some predisposing factors of this pathology?

Ans. Pelvic inflammatory disease, previous induced abortion, tubal surgery (tubal sterilization or reversal of sterilization), in vitro fertilization and embryo transfer.

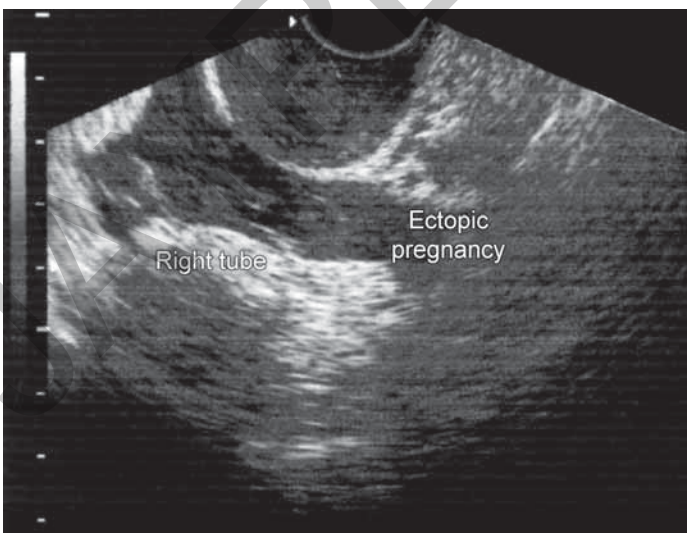


Fig. 1.3: Sonogram showing ectopic pregnancy.
Courtesy: Dr (Mrs) S Ghosh and Prof BN Chakravorty, IRM, Kolkata

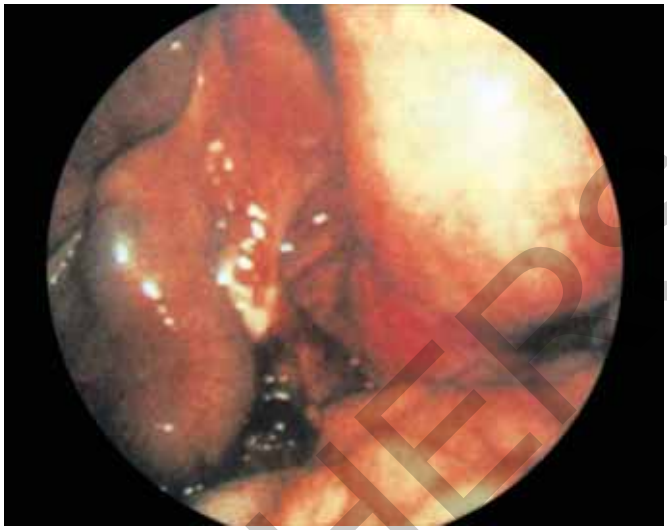


Fig. 1.4: Laparoscopic view of tubal ectopic pregnancy (unruptured).

Q.18 What is the value of serum β-hCG and serum progesterone to predict the diagnosis?

Ans. Serum β-hCG > 2000 IU/L with empty uterine cavity on TVS suggests ectopic pregnancy. Serum progesterone > 25 ng/mL suggests viable intrauterine pregnancy.

Q.19 What would be the appropriate management for her?

Ans. Conservative management for unruptured tubal ectopic pregnancy.

Procedure may be either medical or surgical:

- ***Medical:*** Systemic methotrexate (MTX) or direct local into the sac with agents, like MTX, PGF2α or potassium chloride.
- ***Surgical:*** Salpingostomy or salpingotomy (Fig. 1.5).

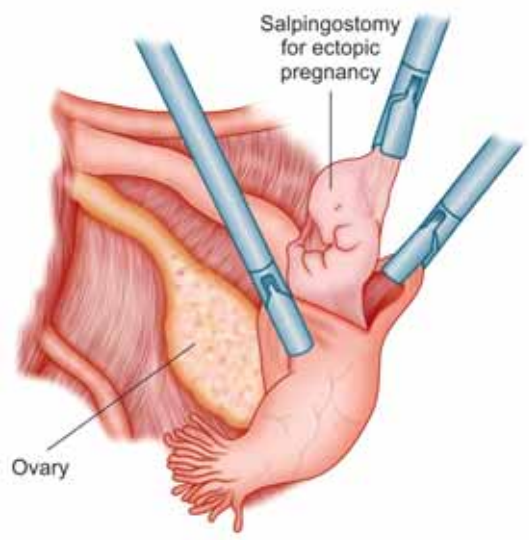


Fig. 1.5: Laparoscopic surgery for tubal ectopic pregnancy.

Q.20 Are all the cases suitable for medical management?

Ans. No. Contraindications are: (i) Tubal diameter > 4 cm; (ii) presence of fetal cardiac activity; (iii) presence of intraperitoneal bleeding or tubal rupture.

Q.21 Does she need any follow-up following the initial treatment?

Ans. She should be followed up with estimation of serum β-hCG weekly till the values are normal. ***But level of serum β-hCG remained plateau on the 10th day of treatment.***

Q.22 What would you do for her?

Ans. She should be treated with systemic chemotherapy (MTX 50 mg/m^2) IM single dose.

After the completion of treatment, she wants to know from you the following questions.

Q.23 What is the risk of recurrence of tubal ectopic pregnancy?

Ans. About 10–15%.

Q.24 What precautionary measures she may take to minimize the risk?

Ans. To avoid the use of intrauterine device (IUD) contraceptive and progestin only pills.

Q.25 How best you can reassure her?

Ans. She is advised to report whenever she misses her period. Serum β-hCG and pelvic ultrasonography should be done to confirm the diagnosis as well as to detect the site of pregnancy.

CASE 4: ABRUPTIO PLACENTAE; PLACENTA PREVIA

Case Summary

Mrs CX, 27-year-old, $P_{1+0+0+1}$, at 37 weeks of gestation was admitted in emergency with the complaints of abdominal pain and vaginal bleeding. On examination, she looked pale, BP 140/96 mm Hg. Uterus was found tender.

Q.26 What is the most likely diagnosis?

Ans. Abruptio placentae.

Q.27 What other signs she may have?

Ans. Difficulty in palpating the fetal parts, difficulty in auscultating the fetal heart sound (FHS), height of the fundus—more than the period of amenorrhea and presence of uterine tenderness.

Q.28 What are the common causes of the problem?

Ans. The exact cause is obscure. The observed associations are:

- Pre-eclampsia
- Sudden uterine decompression (following delivery of the first baby of twins)
- Circumvallate placenta (Fig. 1.6)
- Trauma

Fig. 1.6: Stillbirth following placental abruption in a case with circumvallate placenta.

- Folic acid deficiency
- Smoking, cocaine abuse and thrombophilias.

Q.29 What important investigations you should do for her?

Ans. Blood for Hb%, hematocrit, platelets, coagulation profile, ABO and Rh grouping and cardiotocography.

Q.30 What definitive management you would do for her?

Ans. Resuscitation and termination of pregnancy. Patient may go into labor spontaneously. Otherwise labor may be induced by ARM ± oxytocin.

Q.31 What are the indications of cesarean section in such a condition?

Ans.
- Evidences of fetal distress
- Where amniotomy could not be done as the cervix is unfavorable
- Nonprogress of labor even with amniotomy ± oxytocin
- Associated obstetric complications (breech).

Q.32 How do you explain the indeterminate bleeding?

Ans. The diagnosis of unclassified bleeding is made after exclusion of placental and local causes. Rupture of vasa previa, marginal sinus, circumvallate placenta (Fig. 1.7) or marked decidual reaction on endocervix may be the possible cause.

Q.33 How do you manage a case of vasa previa?

Ans. Color Doppler (TVS) is helpful for antenatal diagnosis. Bleeding cases with vasa previa need delivery by category-I cesarean section. Antenatal corticosteroids should be given in a case with preterm delivery. Management depends on gestational age, severity and the recurrence of bleeding. Pregnancy ≥ 37 weeks → delivery. Expectant management is done in

Fig. 1.7: Circumvallate placenta with abruption. Arrow indicates the ring where the double folds of amnion and chorion with decidua is present.

selected cases only. Neonatal blood transfusion may be needed.

Q.34 What is the relationship between previous cesarean section and incidence of placenta previa?

Ans. Women with a previous cesarean delivery have an increased risk of abnormal placental location (placenta previa). In addition, these women have an increased risk of morbid adherent placenta (placenta accreta, increta or percreta). Risk of placenta accreta with placenta previa without any uterine scar is about 3%. However, this risk increases in cases with prior cesarean delivery (scarred uterus). ***The overall risk of placenta accreta with placenta previa with prior cesarean delivery is 11%, 40% and 60% after the first, second and third cesarean delivery respectively.*** Morbidly adherent placenta leads to significant hemorrhage during cesarean section (CS). This may lead to cesarean hysterectomy. ***Hence, in such a case, operation should be done by an experienced person and blood or blood products should be made available.***

CASE 5: UNSTABLE LIE

Case Summary

Mrs CD is seen in the antenatal clinic at 38 weeks of gestation of her second pregnancy. Single fetus with oblique lie was observed. Antenatal card record revealed that her last visit in the clinic was a week ago and baby was in transverse lie.

Q.35 What is the diagnosis?

Ans. Unstable lie.

Q.36 What should be the appropriate investigations for her?

Ans. Ultrasonography to detect any cause for unstable lie specially placenta previa.

Q.37 What are the important complications of this problem?

Ans. Prelabor rupture of the membranes and cord prolapse.

Q.38 What would be the appropriate approach for management?

Ans. Admission in the hospital and close monitoring.

If no cause is detected, lie may become stable. In that case she may go into spontaneous labor or may be induced (stabilizing induction). Otherwise, she should be delivered by CS.

Q.39 What advise she should be given when she is admitted in the ward?

Ans. To maintain kick-chart. In case the membrane ruptures (leakage of liquor), she should inform the on duty nurse and should not take anything orally until examined by her doctor.

CASE 6: NONPROGRESS OF LABOR

Case Summary

Mrs AD, 26-year-old primigravida, is admitted in labor at 39 weeks of pregnancy. Cervix was 3 cm dilated and membranes were intact. She was having 2–3 contractions at every 10 minutes and each contraction lasting for 10–20 seconds. Fetal heart sound on auscultation was 146 beats/min and were regular. Three hours later, repeat examination revealed that cervix was till 3 cm.

See: Labor Care Guide: WHO 2020, Section 8, Ch 72.

Q.40 What is the diagnosis?

Ans. Nonprogress of labor.

Q.41 What do you mean by nonprogress of labor?

Ans. When the rate of cervical dilatation is less than 1 cm/hour and the descent of the presenting part is less than 1 cm/hour, the condition is known as ***slow progress of labor***. But when there is no change in terms of cervical dilatation and descent of the presenting part over a period of at least 2 hours, the condition is known as ***nonprogress of labor***.

Q.42 What are the reasons for nonprogress of labor?

Ans. The underlying etiologies are often not clearly determined. Weak or abnormal uterine contractions, deflexion of the fetal head, cephalopelvic disproportion, malposition, inadequate or lack of labor analgesia, maternal dehydration are often associated with nonprogress of labor.

Q.43 What would be the next appropriate step to rectify the abnormality?

Ans.
- Maternal rehydration
- Artificial rupture of the membranes (ARM)
- To reassess the woman once again.

Q.44 What would be the next step of management if the situation is not improved?

Ans. Once cephalopelvic disproportion has been excluded, labor process may be augmented with escalating dose of oxytocin infusion.

After 4 hours of regular and strong contractions, she was found fully dilated. Head was at +3 (perineum). Sagittal suture was in the anteroposterior diameter of the pelvis. She was found completely exhausted and was unable to push down (bear down).

Q.45 What would be your next step of management?

Ans.
- To continue oxytocin infusion
- To give her adequate analgesia
- To expedite the delivery by outlet forceps.

Q.46 What are the abnormalities of the active phase of labor?

Ans.
- Protracted active phase
- Arrest of active phase.

Q.47 What do you understand by protracted and arrest of active phase and how do you manage them?

Ans.
- Protraction of labor (WHO, 1994) is defined when the cervical dilatation is less than 1 cm/hour for a minimum of 4 hours during the active phase of labor.
- Arrest of labor in the active phase is defined when there is no dilatation of the cervix for 2 hours or more.

Management: Protraction and arrest disorders during the active phase of labor may be due to poor or incoordinate uterine contractions, malposition, malpresentations or due to cephalopelvic disproportion (CPD).

Management is initiated according to its cause. Expectant management with support, and amniotomy with or without oxytocin augmentation may be effective.

Cases with CPD need to be delivered by CS.

CASE 7: CARDIOTOCOGRAPHY-I

Case Summary

Mrs SC, 27-year-old school teacher, presents in her first pregnancy at 38 weeks of gestation with diminished fetal movements. The cardiotocography was done and is shown in the Figures 1.8 to 1.10.

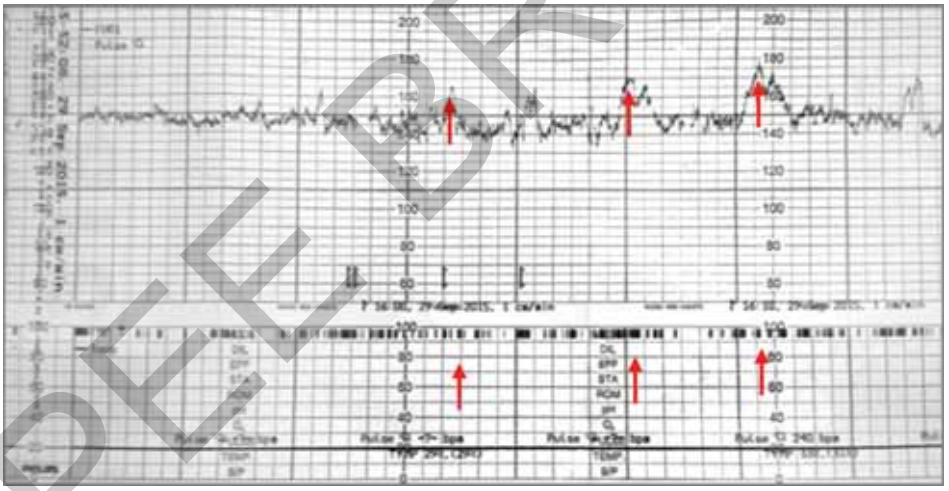


Fig. 1.8: Cardiotocograph showing reactive nonstress test indicated by fetal movements (blocks) with cardiac accelerations (*see* arrows).

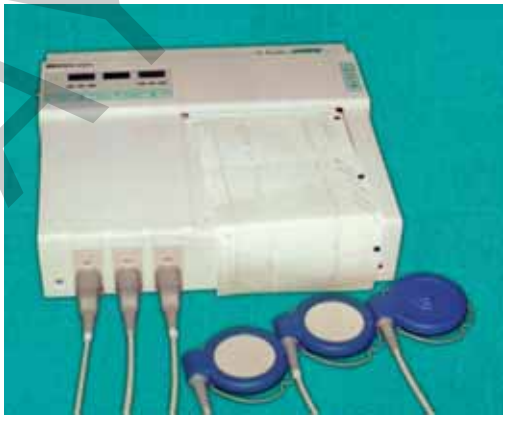


Fig. 1.9: Cardiotocography machine with abdominal transducers.

Fig. 1.10: Cardiotocography is in progress.

Q.48 What is the baseline FHR?
Ans. 150 beat per minute (bpm).

Q.49 What is the baseline variability?
Ans. 10–20 bpm.

Q.50 Is there any sinusoidal pattern?
Ans. Nil.

Q.51 How many accelerations are there in the trace?
Ans. Six within the period of 20 minutes.

Q.52 Is there any deceleration?
Ans. Nil.

Q.53 What about the nonstress test?
Ans. Fetal movements are evidenced by black blocks in the graph. Simultaneously with the fetal movements there is acceleration of the FHR. So, the nonstress test is normal (reassuring pattern).

Q.54 What are the criteria of a normal (reactive) trace?
Ans.
- Baseline FHR between 120 bpm and 160 bpm (RCOG, NICE: 100–160 bpm)
- Baseline variability between 10 bpm and 25 bpm
- Two accelerations in 20 minutes observation
- No deceleration.

Q.55 When a trace pattern is called abnormal?
Ans. ***Pathological trace***
- Baseline heart rate < 100 bpm or > 160 bpm
- Baseline variability < 5 bpm for 90 minutes or more
- No acceleration in 40 minutes
- Repetitive early or variable deceleration
- Repetitive late deceleration
- Sinusoidal pattern.

Q.56 How the CTG traces are categorized?
Ans. According to ***RCOG and NICE the categorization of CTG traces are:*** (a) Normal, (b) suspicious, (c) pathological. Four features are considered for categorization of a CTG trace: ***(a) Baseline FHR, (b) variability, (c) decelerations and (d) accelerations.***
- ***Normal:*** All the four features are reassuring.
- ***Suspicious:*** One non-reassuring and the rest are reassuring.
- ***Pathological:*** Two or more features are non-reassuring.

According to NICHD (2008) and ACOG (2009)
- Interpretation:
  - ***Category I:*** Normal (based on all the four parameters, mentioned above).
  - ***Category II:*** Indeterminate (all tracings not in the category I or III).
  - ***Category III:*** Abnormal (besides others, sinusoidal pattern is considered as abnormal).

Q.57 Name some common causes of fetal bradycardia and tachycardia?
Ans. ***Fetal bradycardia***
- Fetal distress
- Acidosis
- Fetal heart conduction defect
- Drugs to mother (pethidine, methyldopa)

Fetal tachycardia
- Drugs to mother (β-adrenergic agents)
- Infection (mother or fetus)
- Anemia (maternal or fetal)
- Fetal distress.

Q.58 What about the tocograph in the trace?
Ans. The tocograph showed absence of uterine contractions.

Q.59 What are the indications of continuous electronic fetal monitoring during labor?
Ans. Where there is increased risk of intrapartum fetal hypoxia. Conditions are as follows:
- Intrauterine growth restriction (IUGR)
- Meconium stained amniotic fluid
- Maternal hypertension or diabetes
- Malposition (OP) or presentation (breech)
- Previous CS.

CASE 8: CARDIOTOCOGRAPHY-II

Case Summary

Mrs ZC, 26-year-old housewife, $P_{0+0+0+0}$, was admitted at 35.4 weeks of gestation because she was epileptic and the baby was small for gestation. A 30 minutes cardiotocography (CTG) was done when she complained of diminished fetal movements. The CTG trace is shown in the Figure 1.11.

Q.60 What abnormalities are shown in the trace?
Ans. Baseline fetal heart rate was 140 bpm with unprovoked repeated decelerations lasting for more than 3 minutes.

Fig. 1.11: Abnormal nonstress test showing repeated decelerations > 40 bpm and lasting > 3 minutes.

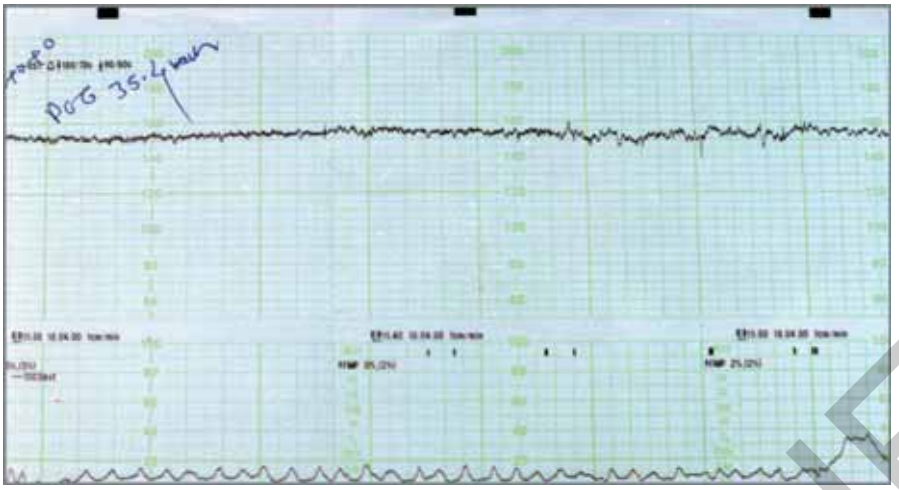


Fig. 1.12: Cardiotocogram showing sinusoidal pattern.

Q.61 What would be the next plan of management?

Ans. Patient should be admitted for continuous monitoring and for biophysical scoring. ***Further CTG showed the trace as shown in the Figure 1.12.***

Q.62 What abnormalities are shown in the trace (Fig. 1.12)? This trace pattern remained persistent on two more occasions.

Ans. ***Sinusoidal pattern***
Fetal baseline heart rate is 155 bpm
Baseline variability is < 5 bpm
Acceleration: Nil.

Q.63 What would be your advice?

Ans. To organize delivery.
On examination, cervix was found unfavorable. She was delivered by lower segment cesarean section (LSCS). The baby on examination revealed as shown in Figure 1.13. The baby weight 1.2 kg.

Fig. 1.13: Neonate with IUGR showing cleft lip and palate.

Q.64 What are the complications for the baby?

Ans.
- Presence of other congenital malformations
- Feeding problem
- Speech problem
- Delayed dentition
- Repeated chest infection due to regurgitation.

CASE 9: MANAGEMENT OF LABOR (PARTOGRAPH-I)

Case Summary

Mrs LT, 23-year-old, was admitted with labor pain following a term pregnancy. Her partograph is shown in the Figure 1.14.
See: WHO recommendations: Intrapartum care for a positive childbirth experience; Section 8, Ch 72.

Q.65 What was the cervical dilatation at the time of admission at 10 am?

Ans. Cervix was only 4 cm dilated.

Q.66 At what time she entered into the active phase of labor?

Ans. At 10 am cervix was 4 cm dilated.

Q.67 At what time she became fully dilated?

Ans. At 7 pm (9 hours since admission) cervix was 10 cm (fully) dilated.

Q.68 What was the duration of the latent phase of labor?

Ans. In this partograph latent phase has not been included.

Q.69 What was the duration of the active phase of labor?

Ans. 9 hours (10 am to 7 pm).

Q.70 How were the uterine contractions for the first 3 hours and the last 1 hour of labor since admission?

Ans. For the first 3 hours, uterine contraction were 2 per 10 minutes and each lasted for less than 20 seconds. For the last 1 hour, the frequency of uterine contractions were 4 per 10 minutes and each lasted more than 40 seconds.