# OBSTRUCTED LABOUR

## ANSWER BOOKLET

PART - II

THE WELLCOME TROPICAL INSTITUTE

# CONTENTS

# UNIT 1

# Management

## ANSWERS TO PROBLEM 1

*Question 1.2*

*Please write your 'model' referral letter. Base your letter on a case such as that of Charity Msowoya.*

Sample referral letter

I would expect every midwife in my district to be able to write a letter similar to the example below.

Nthunduma Maternity Unit
24th December 1987

Dear Doctor,

I received a patient at 6 a.m. Her name is Charity Msowoya from Katumbi village, 15 km from here by footpaths only. She is about 16 years old, speaks Bemba only and is unmarried.

Her grandmother is with her. She says she has been in labour for 24 hours, has not eaten but has had local medicines which have made her vomit.

Clinical findings = temperature 36°, pulse 130, blood pressure 90/50, dry tongue.

Contractions strong and frequent, head 3/5 above the pelvic brim, cervix fully dilated, moulding +, caput + +, and fetal heart heard.

We have no intravenous fluids here (please send more) and I failed to pass a catheter.

She says that she didn't come to our antenatal clinics because the rains made the journey too difficult. I cannot persuade any young relatives to travel with her.

The ground labourer is leaving here with this letter at 7 a.m.

Yours sincerely,

Faith Ngoma (Midwife).

P.S. Labourgraphs are out of stock here.

*References B and J relate to this question.*

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*Question 1.3*

Pre-operative management for Caesarean section

*What pre-operative instructions do you give to prepare for this?*

- Check haemoglobin, group and cross-match donors if available.
- Catheterise - to facilitate operative delivery and to measure the urine output.
- Intravenous fluids - 2 litres of 5% dextrose quickly to compensate for dehydration and ketosis, then 1 litre of normal saline to restore the ECF volume and to be running when the anaesthetic starts - mandatory if using spinal anaesthesia.
- She is probably very frightened and apprehensive. Try to reassure her and help her to understand what you are doing for her and her baby. She will then be much more ready to do what you want her to.
- Decide (if a choice is available) what will be the most appropriate anaesthetic.

*References A (Chapter 32) and B relate to this question.*

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*Question 1.4*

*List in sequence the actions you would take.*
*For each action give a reason.*
*Do not give a technical account of the whole procedure but concentrate on the two particular problems outlined in the boxed statement at the top of the page.*

Procedure for Caesarean section

| Action | Reason |
|---|---|
| Before opening the uterus ask an assistant to disimpact the head with a gloved hand in the vagina. | Without doing so, you may find great difficulty dislodging and delivering the head. If done after opening the uterus, the baby's shoulder may present first, causing your further difficulties. |
| Open the uterus with a pair of scissors and create a U shaped incision, i.e. a transverse lower segment incision with the incision turning 'upwards' in a U shape. | This is to prevent further tearing downwards towards the large uterine vessels. These tears are difficult to repair in themselves but in addition may lead you to damage the ureter in attempting the repair. |

*Reference B relates to this question.*

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| | |
|---|---|
| *Question 1.5* | *List the steps you would take to establish the cause of this fever.* |
| Establishing causes of fever | I will approach this problem in the same logical way as any other clinical problem via the three stages of history, clinical signs and special tests. |
| History | Ask specifically about cough, chest pain, abdominal pain, wound pain, dysuria, urinary frequency and breast pain. |
| Examination | Pulse and blood pressure - in particular these may reveal that she is septicaemic. |
| Lochia | Look for offensive, excessive or scanty lochia. |
| Respiratory rate | If raised, suggestive of pneumonia. |
| Chest signs | If dullness on percussion, crackles, and bronchial breathing, then pneumonia is present (these signs depend on the stage of the pneumonia). |
| Breasts | Look for a local tender area which may suggest an abscess. |
| Abdomen | Palpate for tenderness, either in the wound, of the uterus or elsewhere. |
| Legs | Look for evidence of deep vein thrombosis. |
| Special tests | Urine - Microscopy; are pus cells abundant?<br>Blood - Look for malaria parasites.<br>Sputum - Gram stain: look for many Gram +ve cocci. |
| | *References A (Chapter 53) and H relate to this question.* |

*Question 1.6*

*List the advice, explanations, instructions and any other help Charity should be given in relation to her obstetric future.*
*With each piece of advice, etc. give your reason.*

Advice and follow-up

| Advice etc. | Reason |
|---|---|
| A midwife should explain to her why she needed a Caesarean section. | Only by understanding the problem can it be hoped that she will attend in her next pregnancy. |
| She should receive a card (of the most durable material available) outlining the main point for use by maternity staff in her next pregnancy, e.g. 'Caesarean section for obstructed labour due to a contracted pelvis; elective c.s. indicated in next pregnancy.' | Patients cannot be relied upon to give sophisticated histories or or indeed even to remember the events of two or three years ago. |
| I will arrange that she attend (if she can do so) the rural maternity unit on the day of my next visit there. | This will not only give me the opportunity of reviewing her clinical state but, more importantly, give me an opportunity to reinforce the advice given to her at the district hospital. |
| I will encourage her to take the baby to the under five clinic, run by the midwife. | This will allow the midwife the opportunity to get to know her and be aware of her next pregnancy as well as the accepted benefits to the baby of attending the under five clinic. |

*Reference H relates to this question.*

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## CONCLUSION TO PROBLEM 1

As a result of this case the District Medical Officer organised a mobile antenatal clinic near Charity Msowoya's village. She attended that clinic in her next pregnancy and was safely delivered by elective Caesarean section at the district hospital.

A course was organised for Traditional Birth Attendants throughout the district with the result that from that time on any woman labouring at home for more than 12 hours was referred to the nearest midwife.

Study advice

How did your answers compare with mine?
If you are well satisfied with your own decisions and your reasoning, why not try answering one of the other problems. If, however, you feel you would like to have another opportunity to think through these issues and problems, you will find Problem 2 interesting and useful.

# ANSWERS TO PROBLEM 2

*Question 2.1*

*List possible explanations for her failure to deliver.*
*Give your explanations in order of likelihood.*

- The most likely cause is malpresentation, e.g. a shoulder or brow presentation which is causing obstructed labour.
- Cephalo-pelvic disproportion is less likely because of the past history of nine successful pregnancies. However, this can occur where there is a fetal abnormality such as hydrocephalus.
- The least likely cause, but one that does occur, is obstructed labour owing to an ovarian tumour or uterine fibroid obstructing the delivery passage.

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*Question 2.2*

*What observations and actions should she now take? Give reasons for each point you make.*

| Observation/Action | Reason |
|---|---|
| • Arrange urgent transfer to the district hospital. | Vaginal delivery of the presentation cannot occur. |
| • Assess the general clinical state: temperature, pulse, blood pressure, state of hydration. | She may be able to give intravenous fluids if the observation indicates the need for them. |
| • Catheterise the woman, record the urine volume. | The urinary outflow may well be obstructed by the pressure of the presenting part. The urine volume is part of the assessment of fluid balance. |
| • Give pethidine ..? if allowed to do so. | Pain relief. |
| • Attempt to ensure two fit, suitable adults to travel as blood donors. | It is never easy to find donors at the district hospital. |
| • Write referral letter indicating social and family history. | Helpful for the medical officer to have this knowledge to help with decisions e.g. tubal ligation. |
| • Explain to the patient the nature of the problem. | This will relieve her anxiety and, we hope, will make her more cooperative. |

*Question 2.3*

*What is the significance of these findings?*

Bandl's ring is found around the level of the umbilicus and represents the division between the distended, stretched lower segment and the contracted upper segment. Its significance is that rupture of the uterus will soon occur. The normal fetal heart rate is 120 - 180/minute. A fetal heart rate of 80/minute signifies severe fetal distress.

*Reference B relates to this question.*

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*Question 2.4*

*What problems face you?*
*What do you do to resolve the problems?*
*Give your reasons.*

I am faced with two problems.

- A very difficult lower segment to open safely. Tearing, downwards and laterally, during delivery and involving the large uterine vessels is very likely.
- Cutting through the large veins will result in considerable blood loss until the baby has been delivered and the uterus contracts.

My approach will be to use the low mid-line incision to avoid lateral tearing and haemorrhage from the veins over the lower segment.

If you decided to perform a lower segment transverse incision then you should enlarge the incision 'upwards' in a broad U shape so that tearing does not continue towards the large uterine vessels. When clamping these in a difficult case it is easy to clamp the ureter(s) in error.

*Reference B relates to this question.*

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*Question 2.5*

*Give two arguments for tubal ligation and two against. What would you personally decide and why?*

For tubal ligation

- The woman has a large family, she will be aware that this pregnancy has brought her close to death and so she will be pleased to stop child-bearing.

- A grand multipara with a uterine scar is a major obstetric risk (of ruptured uterus) in her next pregnancy. We cannot even be sure we will see her in that pregnancy. Tubal ligation is justified as a life- saving procedure in this case.

Against tubal ligation

- She has not given informed consent. Even if she is asked about this while she is in labour, how can you expect her to make up her mind rationally at such a time?

- Such a decision must be taken by the husband and wife together, or even by the husband alone. Tubal ligation should be postponed for a later date after a family discussion.

Personal decision

I would personally perform a tubal ligation. I believe that I have an obligation as a doctor for her future well-being which overrides the consideration of informed consent. The point made in paragraph two above, that she may well not be seen in a future pregnancy, is an important one. In my past experience of similar cases in grand multiparae, such women on being told that they would no longer become pregnant were quite overjoyed. I understand that this reaction will vary between different societies in Africa and there is no 'right' answer applicable everywhere.

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*Question 2.6*

*List the steps you would take to identify the cause of her problem.*

- Short, relevant history asking about vomiting, bowels, dysuria, and lochial discharge.

- Check the pulse and blood pressure - even if these have been recorded I like to check them myself - many nurses find difficulty in counting pulse rates over 100/min and clearly a pulse of 150/min has much greater significance than one of 102/min.

- Examine the abdomen - palpate the non-tender area first. Look carefully for a wound infection and check bowel sounds - if they are absent peritonitis is probable. If present, peritonitis is still possible and you must assess all the signs very carefully. Rectal examination may reveal pelvic tenderness owing to a pelvic cellulitis. Look for abdominal distension suggesting an ileus if peritonitis is present.

- If no cause has yet been found, then look at the urine for cells suggesting a bladder infection. The urine for microscopy should be obtained by supra-pubic aspiration of the bladder or by urethral catheterisation.

- Choose appropriate antibiotics, depending on what you find, and re-examine daily to assess progress or signs of deterioration.

*Reference A (Chapter 53) relates to this question.*

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## CONCLUSION TO PROBLEM 2

In this case of a grand multipara the rural midwife's accurate assessment and action led to a successful Caesarean section and a live baby. Tubal ligation was performed and the husband and wife were both grateful that her life would never again be similarly endangered. The lower abdominal pain was the result of a wound infection which was successfully treated.

At future antenatal classes in the woman's area her story was told by the midwife to illustrate the problems of grand multipara and the importance of supervised labour in a maternity unit.

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# ANSWERS TO PROBLEM 3

*Question 3.1*

*How do you intend to deliver this young woman? Explain why you choose the method you do.*

Craniotomy

I will deliver the baby by doing a craniotomy. I will do so because I want to avoid the alternatives of symphysiotomy or Caesarean section in this situation. Caesarean section in this case would be unnecessary and hazardous. Firstly we would have the danger of anaesthesia in an ill patient. Secondly the risk of intra-abdominal infection after two days of labour would be very high. With no live baby at the end of an operative procedure the woman and her relatives would be very unlikely to return to the hospital in the next pregnancy which would then end in ruptured scar and certain death.

*Reference E relates to this question.*

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*Question 3.2*

*Outline the pre-operative management before you proceed with the delivery.*

Pre-operative management for craniotomy

- Check the haemoglobin and cross-match two units of blood if available.
- Inform the theatre and ask them to be ready for a possible laparotomy.
- Correct dehydration and ketoacidosis by giving at least a litre of 5% dextrose.
- Give broad spectrum antibiotics e.g. chloramphenicol 1 g intravenously to combat the infection.
- Give pethidine 50 mg intravenously slowly for pain relief.
- Pass a nasogastric tube and empty the stomach by suction.
- Give ranitidine 150 mg orally as soon as possible and 30 ml 0.3 M sodium citrate before she goes to theatre.

*Reference A (Chapter 48) relates to this question.*

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*Question 3.3*

*Write down what you will say to him, explaining each step so that he knows the reason for everything he has to do.*

Procedure for craniotomy

- Give diazepan intravenously 10-20 mg - as much as required to make the patient drowsy and unaware of the procedure. If she is still in some pain following the first injection of pethidine in the ward give 25-50 g pethidine intravenously again.
- Place her in the lithotomy position, clean and drape the vulva and perineum.
- Ask an assistant to hold one or two Sims specula in the vagina to give you a good view of the head. It is important not to do anything 'blind' and damage the vagina.
- Find a suture line or fontanelle with your finger and incise the skin in this area with a cross-shaped incision.
- Now use your scissors. Keeping them closed push them between the bones, opening and closing them as you do so to enlarge the opening they have made.
- Brain should now extrude. Put a finger into the skull and break up the septa to allow as much material to extrude as possible.
- Using four strong volsella forceps or Kocher, grip the bony margins of the opening. Pull on these. If one breaks away holding a fragment of bone take a deeper bite on the skull but make sure you do not catch any vaginal tissue or the cervix.
- Be very careful that ragged edges of bone do not lacerate the vagina. Traction on the forceps should result in an easy delivery of the head.
- The rest of the delivery is in my experience usually easy. If you find difficulty delivering the shoulders, turn them through 90°. If this does not work then pull down the posterior arm, then turn the fetus through 180° and pull the other arm down. The delivery is then completed easily.
- Do a manual removal of the placenta and make sure to give ergometrine 0.25 mg intravenously stat. This is most important because in these cases the uterus can be atonic and a primary post-partum haemorrhage is a strong possibility.
- You must be aware of the possibility of ruptured uterus after any destructive procedure, although this is less likely with a cephalic presentation than a transverse lie. After delivering the placenta feel the uterus very carefully for any tear. Then inspect the cervix, vagina and vulva for any tears. Repair any you find.

- He should have asked the theatre to prepare for a laparotomy in case a ruptured uterus was found.
- Insert an indwelling catheter for continuous drainage of the bladder.
- Check that the uterus is now well contracted. If it is not, run in oxytocin 10-40 units/litre intravenously over 12 hours.

*Reference A (Chapter 48) relates to this question.*

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*Question 3.4*

*What post-operative instructions are of particular importance in this case and why?*

Post-operative management of craniotomy

- Because of the high risk of serious pelvic infection, high doses of broad spectrum antibiotics must be continued for seven days, e.g. chloramphenicol 500 mg six hourly.
- Because of the likelihood of pressure necrosis to the bladder during the two days of labour, open bladder drainage must be continued for 14 days.
- Continue intravenous fluids slowly for 24 hours as a precaution for any rapid circulatory collapse either because of septicaemia or because of a primary post-partum haemorrhage.

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*Question 3.5*

*i) What is the likely explanation of this new problem?*
*ii) Outline the main points of management of this problem over the next few months.*

Vesico-vaginal fistula

i) It is very likely that this patient has a vesico-vaginal fistula, a common complication of prolonged obstructed labour in primigravidae.

ii) Management

- Continue bladder drainage for three weeks to help encourage healing in a small fistula.
- Twice daily bathing of the vulva followed by application of a barrier cream to prevent ammoniacal dermatitis.
- Treat any urinary tract infection with antibiotics.
- After three weeks remove the catheter and allow the patient to return home. Explain to her that she must return after three months for specialised treatment.
- See her again sooner than three months after delivery. Ensure that her haemoglobin is at least 11 g%, that there is no urinary tract infection (very rare when the bladder is draining constantly through a fistula) and that schistosomiasis, if present, has been treated. Check that the vagina and vulva are clean. Now is the time to refer her to a gynaecologist at a central hospital for further treatment.

*References A (Chapter 55), H and K relate to this question.*

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## CONCLUSION TO PROBLEM 3

Mary Mwenifumbo had a successful repair of her vesico-vaginal fistula at the central hospital and the following year had a full-term healthy baby delivered by elective Caesarean section at the district hospital.

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## ANSWER TO PROBLEM 4

*Question 4.1*

*Use these three papers and Driessen's notes, (Reference A, Chapter 48, pages 145-147), to construct a short list of reasons for and points against each one of these three procedures for dealing with intra-uterine death with an arm or shoulder presentation.*

| | For | Against |
|---|---|---|
| Caesarean section | • Avoids any possibility of rupturing the uterus; Drs Mphahlele and Van Der Meulen delivered all 33 of their cases by this method. | • Breaks rule of 'no Caesarean for a dead baby.' Assumes good anaesthesia and return of the woman in her next pregnancy. |
| Decapitation | • Avoids any manipulation of the fetus which could damage the stretched lower segment.<br>• Best procedure if neck is easily reached. | • Can be difficult to pass the thimble (see Lawson) over the neck.<br>• Specialised instruments often not available in district hospitals. |
| Evisceration | • Technically easier than decapitation.<br>• Can be performed without any special surgical instruments (see Dr Dutta's 41 cases of transverse lie all delivered this way). | • Does involve gentle version and breech extraction which may cause damage to the thin lower segment of the uterus. |

# ANSWERS TO PROBLEM 5

*Question 5.1*

*Write down your diagnosis and your reasons for making it.*

Ruptured uterus

The diagnosis is ruptured uterus, for the following reasons.

Reasons

- The history is that of obstructed labour in a multigravida. We know that rupture of the uterus is the almost inevitable outcome of obstructed labour which is unrelieved by an operative delivery.
- The examination reveals no contractions. Whereas a primigravida with obstructed labour may eventually stop contracting this is not the case in the multigravida. The cessation of contractions is highly suggestive of uterine rupture.
- The ease with which the fetal parts can be palpated is another common finding in this condition.
- The absence of the fetal heart supports the diagnosis but on its own is not diagnostic. However in this case its absence confirms, with the other signs, the diagnosis.

*Reference B relates to this question.*

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*Question 5.2*

*Is the normal blood pressure an expected finding? Give a reason for your answer.*

Yes, the normal blood pressure is an expected finding, particularly in an early case of uterine rupture.

The reason is because of the impacted presenting part compressing the torn bleeding areas. The tear itself may not have involved major vessels. However, in some cases of ruptured uterus the picture may be more dramatic with shock in the early stages if the large uterine vessels in the broad ligament are torn and bleeding freely. The patient will then have a fast, thready pulse and low blood pressure.

*Reference B relates to this question.*

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*Question 5.3*

*Explain why this problem can arise in a fourth pregnancy in a woman who has had previous vaginal deliveries.*

It is recognised that the peak incidence of rupture of the uterus is in the third and fourth pregnancies. Professor Lawson believes that this is due to progressive increase in the birth weight in these pregnancies compared to the first two. In our patient's case we can postulate that she has a borderline pelvis; the combination of a larger baby than she has previously had and the occipito-posterior position which presents a large diameter (11-12 cm) compared to 10 cm in the occipito-anterior position has lead to cephalo-pelvic disproportion as the cause of her obstructed labour.

*Reference I (pages 203-210) relates to this question.*

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*Question 5.4*

*What signs, in addition to those given for this Problem, would you expect your junior medical assistant to look for?*
*List these signs in note form.*

Signs before rupture

- Shortly before rupture occurs contractions become increasingly frequent and last longer. Finally the uterus may reach a state of tonic uterine contraction.

- Bandl's ring may be seen on inspection of the abdomen. It is a contraction ring between the distended lower segment and the contracted upper segment of the uterus. The outline of the distended bladder may also be noted.

- On vaginal examination the cervix is usually fully dilated and the presenting part is high.

Signs after rupture

- When the uterus has actually ruptured the woman will complain of severe pain which is now continuous and she will be distressed.

- On examining the abdomen the commonest finding is of generalised tenderness, although in some cases tenderness is confined to the lower segment. It is often very difficult to feel the uterus separate from the fetal parts but there is usually an irregularity rather than the smooth surface of the uterus.

- Vaginal examination may reveal bleeding and the head which was previously impacted may now be easily dislodged.

- Catheterisation can be easily performed whereas it is frequently impossible or very difficult in obstructed labour. The urine may well be blood-stained.

*Reference B relates to this problem.*

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*Question 5.5*

*Write down the pre-operative instructions to be carried out by the nurses.*

Pre-operative management of ruptured uterus

- Blood to be taken for haemoglobin estimation, and cross-matching of two units of blood at least.
- Start intravenous infusion of normal saline; try to give 1-2 litres in the time available.
- Catheterise and record urine volume.
- Give a large dose of broad-spectrum antibiotic e.g. chloramphenicol 1 g intravenously.
- Nil by mouth. Pass nasogastric tube, aspirate stomach contents and give antacids.
- Prepare the patient for laparotomy as soon as theatre is ready.

*References A (Chapter 45) and D relate to this question.*

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*Question 5.6*

*i) Which should he give?*
*Explain the reason for your decision.*
*ii) Should he consider any other form of anaesthesia and why?*

i) You should ask him to give a general anaesthetic. If the woman's general condition is very poor, as is sometimes the case in those who present many hours after rupture has occurred, then you may have to proceed with local anaesthesia and intravenous pethidine.
ii) Spinal anaesthesia should not be used because of the very great danger of circulatory collapse in a patient who is already hypotensive.

*Reference D relates to this question.*

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*Question 5.7*

*Outline briefly how you will proceed. Write your answer as if you are explaining to your assistant at the operation what you are doing, step-by-step, so that he can eventually take over from you in future cases.*

Procedure for ruptured uterus

- First of all we must decide whether we shall repair the tear or do a sub-total hysterectomy. As we are inexperienced a simple repair is almost always the easier procedure. Sometimes when there is a posterior tear or a tear so extensive that the uterus is almost detached from the cervix then there is no choice but to do a sub-total hysterectomy.
  In this case, which is an anterior tear, we shall do a repair.

- We look for any dead tissue to excise; we do not excise any other tissue in an attempt to trim a ragged tear.

- We now gently reflect the bladder downwards with a gauze swab to help us avoid it when suturing the tear.

- If the tear is in the lower segment and extends low and laterally, look out for the ureter so that you can avoid it. Only put sutures in the uterine tear when you have clearly identified the edges. Our aim must be to avoid catching a ureter in a suture and ligating it.

- We now repair the tear starting at the apex using continuous chromic cat-gut number one or two. If it is difficult to start at the apex we can start at the other end and with traction on the suture bring the apex into a more accessible position. We use only one layer of suture material.

- Close the peritoneum over the uterus. Abdominal drains are not useful in cases of this nature but if the broad ligament has been involved in the tear then we would place a drain from the broad ligament into the vagina by leaving a small enclosed area at the inferior end of the tear.

- We tie both fallopian tubes. This, unfortunately, is mandatory because a repaired uterus cannot withstand a future pregnancy.

- Finally we clean out the abdomen with warm saline and close in three layers in the usual way.

*References A (Chapter 45) and D relate to this question.*

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*Question 5.8*

*Write down the post-operative instructions which you wish the nurses to follow on the ward.*

Post-operative management of ruptured uterus

Post-operative instructions for ward staff:

- Record pulse and blood pressure hourly for the first six hours, then continue with four hourly temperature, pulse and blood pressure recordings. (We cannot expect such ideally frequent observations if there is only one nurse running the entire maternity unit in the hospital).
- Transfuse whole blood, if depending on estimated blood loss and signs of shock.
- 'Drip and suck' until bowel sounds return.
- Cover with broad spectrum antibiotics for five days.
- Continuous bladder drainage with a catheter for ten days if there is any suspicion that the bladder has been damaged.

*Reference A (Chapter 45) relates to this question.*

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*Question 5.9*

*i) Write down the important clinical signs you would look for when you see her in the ward.*

*ii) Outline the important management steps at this stage, before possible surgical intervention.*

i) Check her pulse and blood pressure to assess whether the blood loss has been large enough to affect her circulation by making her hypovolaemic.

ii) Correct hypovolaemia, if present, with normal saline. Cross match blood and re-check the haemoglobin. Give ergometrine 0.25 mg immediately via an intravenous infusion. Arrange an examination under anaesthesia with the theatre staff prepared for you to proceed to a laparotomy.

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*Question 5.10*

*i) What possible alternatives are there to deal with this problem?*
*ii) Which would you choose and why?*

i) The alternatives are to resuture the wound or to do a sub-total hysterectomy.
ii) I would choose to do the hysterectomy on the basis that I could not be sure that secondary suturing would be more successful than the first repair. I do not want her to undergo a third laparotomy and indeed either she or her husband might well not give consent for yet another operation.

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*Question 5.11*

*Write down exactly what you will say to her. Do so in a way which takes account of her level of knowledge and which acknowledges the sadness she feels having lost this baby and learning that she can have no more.*

Whenever I have to explain to patients about problems such as this I try to make sure that they understand what has happened to them and why. Simple statements of fact are not enough. Beware of sounding 'matter of fact' about a problem which you deal with quite often but which for the patient is a once in a lifetime disaster. It is a good rule never to underestimate intelligence and never to overestimate knowledge. Uneducated people are not unintelligent people.

I should start by talking to her about the way the hospital has helped her. Go over the story of her labour reminding her of her unusually long labour and severe pain. She will probably believe that this was due to outside forces in keeping with her cultural beliefs so do not stress your explanation of why she had obstructed labour. Tell her that when she arrived at the district hospital the baby was dead and that she was bleeding inside. Ask her if she knows of women who have died in childbirth.

I would then outline the operation, how the womb was torn apart and how two operations were required to stop her bleeding to death. Although she has lost a baby her two children at home have not lost their mother.

At this point it is not uncommon to be praised and thanked. Now is the time to explain that the torn womb has been removed. Tell her quite truthfully that she will have no more monthly periods or ever again conceive. At the same time say that a further pregnancy in a womb which has torn apart always ends in the same, often fatal, way.

I should end by saying that I know how sad she must be to know that she can have no more children but that I am also glad to see her well again and able to go home to her children.

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# ANSWERS TO PROBLEM 6

*Question 6.1*

*Prepare this talk in note form. You may find it useful to divide it into four sections:*

- *The indications for symphysiotomy.*
- *The procedure itself.*
- *The complications and the post-operative care.*
- *Concluding summary stating the case for the usefulness of symphysiotomy in the district hospital.*

Indications for symphysiotomy

- Cephalo-pelvic disproportion with the head jammed deeply in the pelvis.
- Vacuum extraction has only just failed or when it would succeed but with great difficulty, thus endangering the baby.
- Prolonged second stage; immediate symphysiotomy is better than first trying the vacuum extractor when the conditions make you suspect that delivery is unlikely.

Before starting the procedure we check that certain conditions are present and that other conditions which are contra-indications are absent.

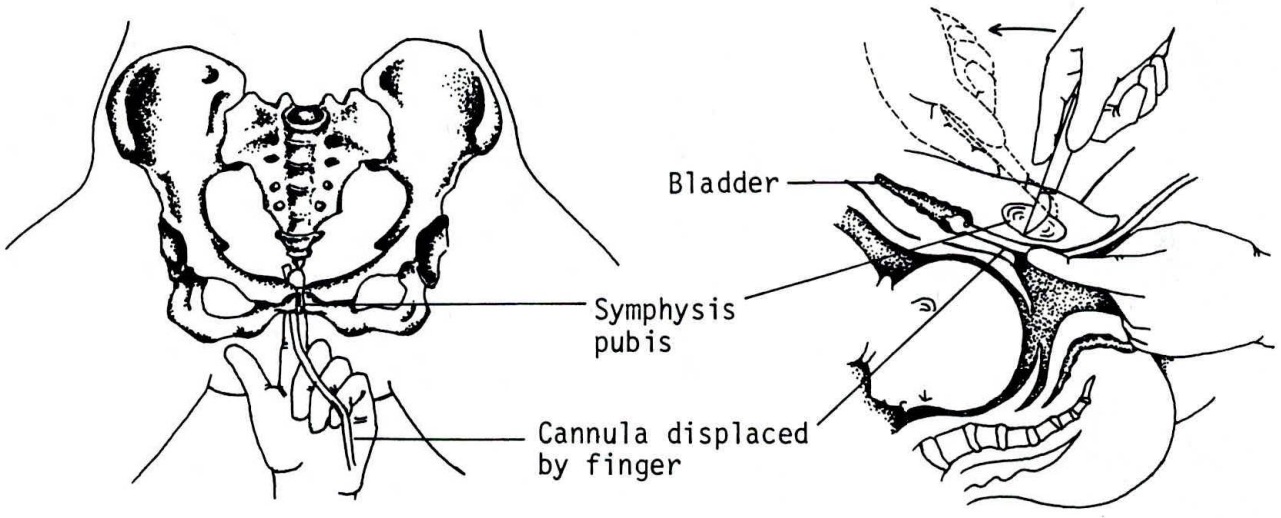
- The baby must be alive.
- The head is 2/5 or less palpable abdominally.
- There is no overlap of the anterior parietal eminence over the symphysis pubis.
- The baby is not very big - severe damage to the pelvis may ensue if the baby is large.
- The cervix is 8 cm or more dilated.
- There should be no maternal locomotor disability arising from the spine, pelvis or legs.
- There should not be gross obesity.
- There should not be gross cephalo-pelvic disproportion and no evidence of impending rupture.

Procedure

- Explain what you are doing to the patient.
- Place patient in lithotomy position with the legs abducted to not more than $80^{o}$; two assistants must hold the legs. Greater abduction will damage the sacroiliac joints.
- Disinfect the lower abdomen and vulva and then infiltrate around the symphysis pubis and perineum.
- Catheterise.
- Apply vacuum extractor and pull once to check that an easy delivery will not occur.
- Put one finger between the head and the symphysis to push the urethra, with the catheter in it, aside.

- Incise the symphysis pubis in the mid-line as in the diagrams below. If there is any difficulty feeling the tip of the blade with the finger behind the pubis symphysis then you are not in the exact mid-line. The symphysis now separates and you should be able to place a finger in the gap. The separation should be limited to 2.5cm.
- Make a large episiotomy.

Figure 1 Symphysiotomy




- Deliver using the vacuum extractor; deliver the baby 'away' from the symphysis to avoid more strain on the urethra.
- Any bleeding from the area of the incision can be stopped by pressure between finger and thumb. It usually stops bleeding as soon as the baby is born.
- Repair the skin incision over the symphysis with one suture and then repair the episiotomy.

Complications

- Sepsis and haematoma at the operation site - both rare.
- Stress incontinence - fairly common but full control is usually regained.
- Injury to bladder and urethra - occur if technique is faulty; therefore a complication which should not occur.
- Pelvic instability - this can occur but is remarkably uncommon.
- Failure to effect vaginal delivery - this will only happen if the procedure is attempted in the presence of unfavourable conditions. If the indications are correct and there are no adverse factors, failure will not occur.

Post-operative care

- Continuous bladder drainage with a Foley catheter: for three days if procedure uncomplicated but if any suspicion of prolonged pressure on the bladder during labour, or if there is blood stained urine then leave the catheter in for one to three weeks.
- Complete bed-rest for three days; allow gentle mobilisation only for the next few days. Most patients will walk well by the tenth day.
- Give antibiotics using the same regimen as for a Caesarean section.
- Analgesia as required.

Concluding summary

- Clinical decisions in district hospitals have to be made in the light of limited resouirces both of people and equipment. A hospital may have no intravenous fluids and sometimes even no antibiotics. Anaesthetics may have to be administred by unqualified assistants. The nurse who attends the operating theatre may, by doing so, leave the maternity ward unattended.
- Symphysiotomy avoids the dangers of general and spinal anaesthesia used for Caesarean section.
- The complications of Caesarean section are avoided.
- There is no risk of ruptured scar in future pregnancy - rural patients can sometimes not reach the district hospital in the rainy season.
- Symphysiotomy takes less than 15 minutes to perform. This is an important considertion for a single District Medical Officer. Medical ethical philosophers argue that our duty to the individual patient may have to be balanced by our obligations to others when we are faced with allocating scarce resources. In this situation the District Medical Officer's time is the limited resource.

*References A (Chapter 42), C and I relate to this question.*

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*Question 6.2*

*Using the study material produce two arguments against:*

*i) his statement that the pelvis will be unstable following symphysiotomy, and,*

*ii) his recommendation of Caesarean section in all cases.*

i) Professor Philpott, the ex-Professor of Obstetrics in Nairobi, has described his experience of over 500 symphysiotomies (*Reference C*). He admits that we cannot be certain how frequently women develop pelvic instability after symphysiotomy but that the evidence available suggests that it is not common. The stability of the pelvis depends on the sacro-iliac joints; by doing a surgical symphysiotomy they are in fact protected from a dangerous degree of separation by controlling the abduction of the legs and by the relatively short time that the delivery takes compared to the considerable time for a difficult vaginal delivery.

Professor Philpott writes that symphysiotomy fell into disrepute because of the worry about pelvic instability and difficulty with walking as a consequence. This came about because the operation was being done incorrectly for cases of gross cephalo-pelvic disproportion. He feels that the operation needs to be reinstated as an excellent procedure in developing countries for cases of mild cephalo-pelvic disproportion.

ii) Dr Driessen (*Reference A*) writes that in cases where the head is deeply jammed in the pelvis with caput visible at the vulva, Caesarean section will be disastrous because of tears in the lower segment, bleeding and sepsis. In his opinion symphysiotomy is life-saving for the mother and in his words 'a must'.

Professor Lawson writes in his textbook (Reference I) something that all district medical officers know only too well that in rural areas where many people live great distances from the hospital, Caesarean section leads to the possibility of a ruptured scar in a subsequent unsupervised labour. This long-term consideration should always be in our minds when we are considering delivery by Caesarean section.

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# UNIT 2

# Prevention

# ANSWERS TO PROBLEM 1

*Question 1.1*

*Write a statement defining the role of the midwife in a rural area in the prevention of obstructed labour and its complications.*

Midwife's role

The midwife's role is to prevent obstructed labour and its complications by using her knowledge of the predisposing factors which she can discover through taking a thorough obstetric history and by being alert to those clinical signs found on examination which indicate potential problems in labour. She must ensure that all such women are seen by a senior midwife or the District Medical Officer for a further assessment at a future date either at her rural unit or at the district hospital if appropriate.

*Reference M relates to this question.*

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*Question 1.2*

*Produce such a protocol. It should contain the risk factors that a midwife must identify, the reason this antenatal finding is a risk factor, and the steps she should take when she has identified the woman at risk.*

| **Risk factor** | **Reason** | **Action** |
|---|---|---|
| • Previous obstetric history of prolonged labour or still-birth. | Both suggestive of cephalo-pelvic disproportion (CPD). | Refer to senior staff for pelvic assessment. Explain to woman that delivery at district hospital may be necessary. |
| • Past history of vesico-vaginal fistula | Confirms severe CPD in previous labour | Arrange transfer to district hospital at 36 weeks to await elective Caesarean section. |
| • Previous delivery of large baby. | Subsequent baby can be even larger leading to CPD or shoulder dyslocia even in a woman with a good past obstetric record. | Refer to senior staff for assessment. |
| • Young girls not physically fully mature | High risk of CPD owing to pelvis not fully grown. Maternal mortality known to be higher in this age group compared to 20-30 year olds. | Refer to senior staff for assessment. Delivery may be planned at rural unit if i) labour closely supervised, ii) good communication to facilitate transfer to district hospital. |
| • Past history of section for prolonged despite previous deliveries. | Despite subsequent vaginal deliveries these women remain a high risk for obstructed labour and ruptured scar. | Transfer at 36 weeks to district hospital or close by. Delivery must take place in a unit with operative facilities. |

| Risk factor | Reason | Action |
|---|---|---|
| • Pelvic assessment revealing a contracted pelvis. | High risk of CPD. | Refer to senior staff to confirm findings. |
| • Very short women, for example those below 147 cm. (This height varies in different populations). | Very short women have smaller pelvises & are more likely to have CPD than taller women. | Refer to senior staff for assessment. |
| • Grand multipara. | At risk of abnormal presentation e.g. arm presentation and can progress to obstructed labour and ruptured uterus in a short time. | Advise these women to await delivery in or near the district hospital. Reassure them you expect a vaginal delivery in most cases. |

*Reference A (Chapter 2) relates to this question.*

*Question 1.3*

*Produce a list for the use of all your maternity staff of five causes of obstructed labour excluding cephalo-pelvic disproportion.*

Causes of obstructed labour excluding CPD

- Abnormal presentation: an impacted transverse lie.
- Abnormal presentation: breech, obstructed most commonly by the arm and head together after traction on the trunk.
- Abnormal presentation: compound presentation of head and arm; certain others which cannot be delivered - brow, face with chin in the posterior position.
- Abnormality of the fetus, for example hydrocephalus or locked twins.
- Tumours in the pelvis, cervical stenosis.

*Reference L relates to this question.*

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*Question 1.4*

*i) Write down what you will say to the midwife using this example to make sure she understands the points it illustrates.*

*ii) Produce a further example with notes on the teaching points it emphasises for you to use in practice in your district.*

i) I shall ask her what risk factors she can identify in the history as given so far: age, because we know that in general girls of this age are a high-risk group for cephalo-pelvic disproportion (CPD) and the previous early neonatal death at six hours. Although some early neonatal deaths are due to severe congenital abnormalities, the midwife can discover if CPD was the cause by asking about the length of the first labour. A labour lasting more than 24 hours followed by an early death like this is almost confirmatory of CPD.

I would then go on to discuss with the midwife the future management. She should be able to tell me that this girl needs to have a careful supervised trial of labour at the district hospital with a strong possibility of an operative delivery.

ii) The way to approach this is to choose a risk factor and incorporate it into a case-history in such a way that the point you want to get over is established by the midwife asking more questions to show you that she understands. For example, you could choose a past history of a stillbirth; many midwives will record this and inquire no further. What you want to know and what they must ask is: 'Was the baby alive at the start of labour?'; 'How long was the labour?'; 'If the baby was delivered at a district hospital was an anaesthetic given - suggesting a destructive procedure?' These questions provide the information which allows the midwife to infer that the stillbirth was caused by obstructed labour.

*References A (Chapter 2) and J relate to this question.*

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*Question 1.5* *Make a list of the main points you wish her to understand, then for each point outline how you will explain it to her.*

| Main points | Explanation |
|---|---|
| • Ask all women about the length(s) of previous labour and whether there has been a stillbirth. We want to see women who have laboured for more than a day. | Long labour and stillbirths are not the result of any wrong done by the woman or her husband but occur because the baby is too big for the birth passage. This problem does not go away but happens in each labour. Take the woman to a midwife for her advice. |
| • Has the woman ever had an operation at the time of childbirth? (This question should identify all those who had Caesarean section, symphysiotomy, destructive operation or vesico-vaginal fistula surgery). | These operations saved the woman's life and maybe her baby's. She may die if you try to deliver her in the village. Take the woman to a midwife for her advice. |
| • All very young girls, and all older women who have had five or more babies. | Young girl's bodies are not ready for childbirth; older women's bodies are tired of bearing babies. All these women can die or become very ill in childbirth. Take all such women to a midwife for advice. |

*Reference N relates to this question.*

*Question 1.6*

*What steps could you take and what provision would you make to ensure that all the women identified by midwives and TBAs throughout the district are under your close observation at the beginning of labour?*

Accommodation for at-risk women

The whole programme of selecting high risk women and so preventing obstructed labour from occurring, and therefore eliminating its sometimes dreadful complications, fails if these women are not in the district hospital or close by at the start of labour. It depends for its success on one practical issue: the provision of accommodation for the waiting mothers, their relatives who will help them in the ward after delivery and any children who must be with them.

Buildings must be constructed on a scale to accommodate the expected numbers; plan one room for three people for each expected 'case'. There must be cooking areas, adequate latrines and an area for storing firewood.

Funding can be a problem. Bureaucracy often makes it impossible to assign any of the hospital's 'votes' to such a project despite the fact that it is a most cost effective programme. Good buildings can be built, however, using local materials on a 'self-help' basis with the cooperation of local leaders, churches and politicians.

In my old district, having built this type of accommodation for waiting mothers, as an extra inducement for its use we provided all at-risk women with food tickets which allowed them to collect meals for themselves from the hospital kitchen, throughout their waiting period.

*Reference M relates to this question.*

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*Question 1.7*

*Are there any groups of women whom you would not want to go into labour in the first place but rather deliver by Caesarean section as an elective procedure? Make a list of these cases with an explanation for the inclusion of each on your list.*

Elective Caesarean section

- Two or more previous Caesarean sections - ruptured scar very likely if allowed to labour.
- One previous Caesarean section for cephalo-pelvic disproportion - ruptured scar likely.
- One previous Caesarean section for other indications combined with the following findings at or near term - breech, persistent transverse lie, borderline pelvis, large baby, previous classical section or inverted 'T' incision - all predispose to the likelihood of ruptured scar.
- Previous surgery for or continued presence of vesico-vaginal fistula - confirms severe cephalo-pelvic disproportion. Likelihood of obstructed labour. Any new fistula formed would be very difficult to repair.

*Reference A (Chapter 5) relates to this question.*

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## CONCLUSION TO PROBLEM 1

You are now in a position to ensure that all the health workers in the district involved with maternity work are able to identify at risk women and to make correct decisions about their management. As you know, some women may not be recognised as having problems until cephalo-pelvic disproportion is identified during labour itself. The next section of the unit will be on the labourgraph and its use in particular for identifying abnormal labour due to cephalo-pelvic disproportion.

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# ANSWERS TO PROBLEM 2

*Question 2.1*

*Using the resource material provided with this module, write down in note form answers to the following questions.*

*i) Why is the labourgraph so useful to midwives and doctors?*

*ii) What is the gradient in cm/hour of normal cervical dilatation? Why is this figure taken as the normal rate?*

Usefulness of labourgraph

i) The labourgraph has been found to be an excellent way of recording the progress of labour. It provides a visual record of labour and is easy to use. The alert line provides a simple screening device for abnormal labour due to cephalo-pelvic disproportion and inefficient uterine contraction. It is particularly helpful to midwives working on their own in rural areas allowing them to assess and transfer patients at clearly defined times. The labourgraph is also useful in teaching midwives about abnormal labour.

Rate of normal cervical dilatation

ii) The gradient for normal labour of cervical dilation is 1 cm per hour or faster, i.e. more than 1 cm per hour. Philpott and Castle have taken this rate from their studies of African primigravidae. It represents the mean rate of cervical dilatation of the slowest 10%. They showed that by taking this rate as the slowest rate of normal labour, abnormal labour could best be distinguished from normal labour.

*Reference P relates to this question.*

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*Question 2.2*

*Write down a short definition of the following:*

- *Alert line*
- *Action line*
- *Latent phase of labour*
- *Prolonged latent phase of labour*
- *Active phase of labour*
- *Prolonged active phase of labour*
- *Descent of the fetal head.*

Definitions

The **alert line** is a line drawn on the labourgraph starting at 3 cm of dilatation on that section of the labourgraph on which we record the active phase of labour. It is the line which separates normal from abnormal labour.

The **action line(s)** is drawn four hours to the right of the alert line for primigravidae and three hours to the right for multigravidae. It is called the action line because action to correct delay in the progress of labour must be taken before the action line is reached or at the very latest when it is reached. A doctor must see the patient if the action line is crossed.

The **latent phase of labour** extends from the onset of labour until in primigravida the cervix is 3 cm dilated and fully effaced, and in multipara the cervix is 3 cm dilated but not necessarily fully effaced. This phase can last up to eight hours and is recorded on the left side of the labourgraph.

The **prolonged latent phase of labour** occurs if a patient who has been admitted in labour has not progressed to the active phase after eight hours. In rural Africa an expectant approach is best. You may need two labourgraphs to plot out a prolonged latent phase.

The **active phase of labour** begins when the latent phase ends and continues until full dilatation of the cervix signifies the onset of the second stage.

The **prolonged active phase of labour** occurs when the active phase proceeds too slowly. Either cervical dilation occurs too slowly from the start of the active phase and the graph lies to the right of the alert line or cervical dilation proceeds at a normal rate, i.e. to the left of the alert line but then at 6 cm or more progress stops - a condition known as secondary arrest.

**Descent of the fetal head** is measured by abdominal palpation and recorded on the labourgraph as a measure of the progress of labour. This descent is measured in 'fifths' of fetal head palpable above the pelvic brim.

*Reference O relates to this question.*

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*Question 2.3*

*Write down in note form the guidelines for the intervals between assessments of the progress of labour.*
*Give reasons for the guidelines.*

Assessment of the progress of labour

- Vaginal examinations should be carried out every four hours in primigravidae and every three hours in multiparae. The shorter interval in multiparae is because labour progresses more rapidly in these women.

- Vaginal examination should be performed when the membranes rupture in addition to the other examinations to exclude prolapse of the cord. This is particularly likely to occur when the presenting part is high.

- If a woman wishes to push, then a vaginal assessment is made to see whether or not she is fully dilated.

- If at the last vaginal examination the cervix was 7cm or more dilated the next vaginal examination is brought forward to the anticipated time of full dilatation.

- In a primigravida who is to the right of the alert line and who, after excluding cephalo-pelvic disproportion is being stimulated by oxytocin, vaginal examinations should be at intervals of three hours, unless there is fetal distress when a further assessment must be made.

*Reference A (Chapter 20) relates to this question.*

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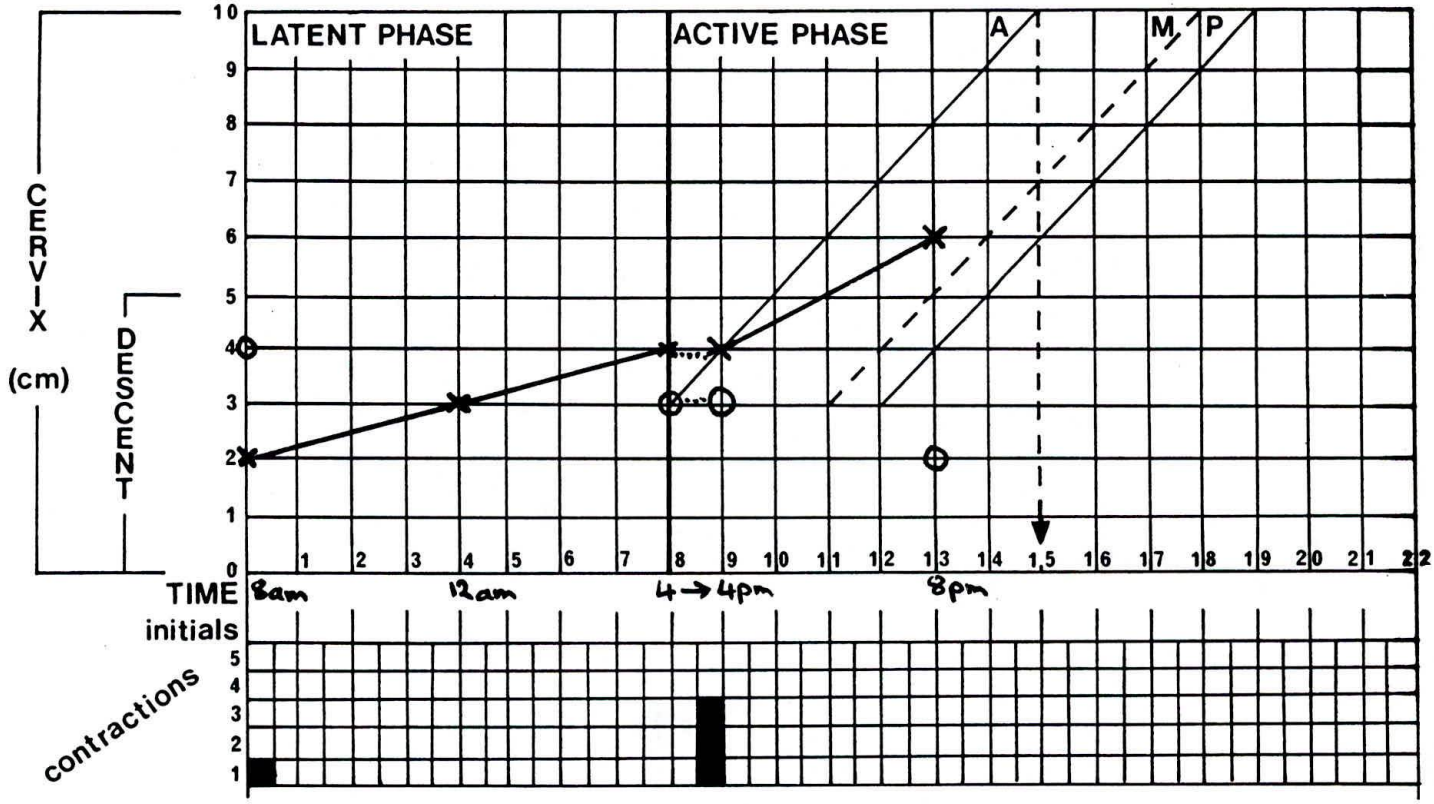
A 16-year-old primigravida who has attended antenatal clinics arrives at a rural maternity unit at 8 a.m. in early labour. Examination shows her to be contracting 1 in 10 minutes, the head is palpable 4/5 abdominally and the cervix is 2 cm dilated. The midwife performs the next vaginal examination at 12 a.m. and finds the cervix 3 cm dilated but not fully effaced. At 4 p.m. repeat examination reveals a fully effaced cervix, 4 cm dilated; the head is now 3/5 palpable and she is contracting 3 in 10 minutes, each contraction lasting about 30 seconds. The membranes have ruptured spontaneously and the fetal heart is good. At 8 p.m. the cervix is 6 cm dilated, the head 2/5 abdominally.

*Question 2.4* *Complete the labourgraph with the information provided so far.*



*Question 2.5*

*What should the management decision be at this point?*

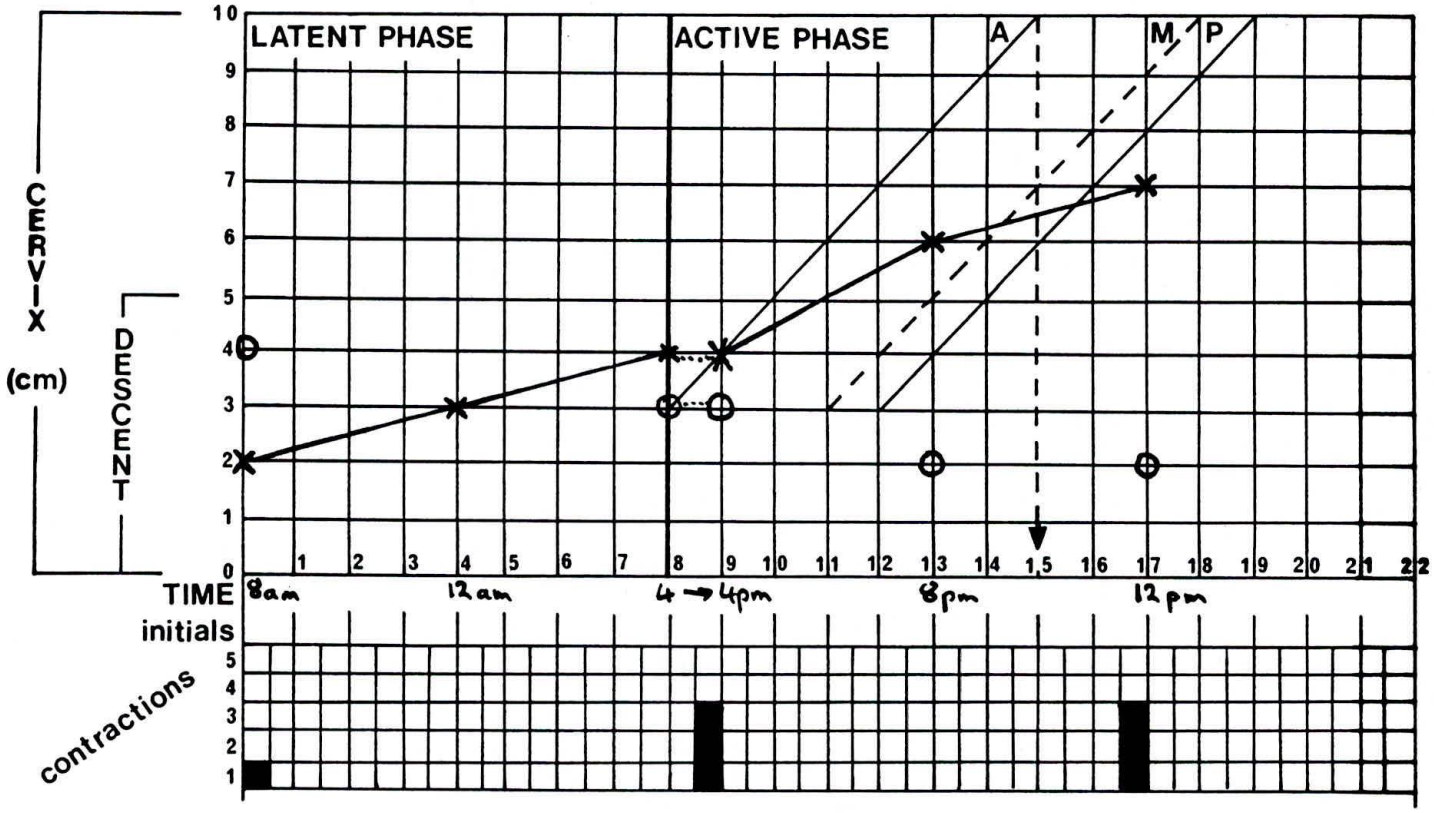
Transfer the patient as soon as possible to the district hospital. The labourgraph must be sent with her.

---

The patient arrives at the district hospital at midnight and the midwife reports that the head is 2/5 palpable, contractions are 3 in 10 minutes, lasting for 30 seconds and the cervix is 7cm dilated. The pelvis, she feels is adequate and the fetal heart good.

*Question 2.6*

*Enter this information in the labourgraph. What should the midwife do now?*




The action line has been reached; the medical officer or a senior midwife must be called to assess the patient.

*Question 2.7*

*Assume that this patient had been at the district hospital throughout her labour (and had not started at a rural unit). What would have been the correct management at 8 p.m.?*

If the patient had been at the hospital throughout her labour then the assessment by a senior midwife or medical officer should have been carried out as soon as the alert line was crossed. In this example of a young primigravida the problem will almost certainly be cephalo-pelvic disproportion or inefficient uterine contractions. If the pelvis is thought to be adequate, labour should be stimulated with oxytocin. The important point is that action should be taken before the action line is reached if possible.

*Reference Q relates to this question.*

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*Question 2.8*

*When should the next vaginal examination be performed?*

After an interval of three hours or earlier if there is evidence of fetal distress or if the patient wishes to push.

---

*Question 2.9*

*If the 3 a.m. vaginal examination had revealed cervical dilation of 8 cm, what decision would you have made?*
*Give your reasons.*

At this stage with there having been strong contractions for a number of hours and still lack of progress, the problem becomes one of cephalo-pelvic disproportion. In this case, the descent of the head and the cervical dilatation of 8 cm make delivery by symphysiotomy an attractive method, providing the other conditions are fulfilled (see Unit 1). The alternative would be delivery by LSCS.

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*Question 2.10*

*Make a list of the problems rural midwives face when they want to transfer women in labour to the district hospital. For each problem try to suggest a solution.*

Problems in arranging transfers

- Patient refuses to travel, may even abscond at this stage in labour. Her husband may be required to give his permission.

  Anticipate this problem by including it as the subject of a talk given by the midwife to each antenatal class as part of her health education talks.

  Try to find someone in the village who has been through a similar problem - with a successful outcome - to talk to the woman in labour to help you persuade her to go to the district hospital.

- Problems with actually getting a message through to the district hospital. Someone usually has to travel with it and this can take a long time. Problems I met were of bicycles being broken and messengers refusing to go out after dark because of their fear of wild animals.

  Midwives may sometimes have to request transfer towards the end of the day when they have a suspicion, rather than proof, that labour may not progress during the night. Medical officers need to inspect bicycles when they visit rural units and make sure repairs are done.

- Transport may be unavailable at the district hospital. This may be because the vehicle is out on other duties or broken down.

  Vehicle breakdown, as all District Medical Officers know only too well, is a major problem. In urgent cases, other government departments - agriculture, police, etc. may be asked to help out while the hospital supplies the petrol. In general the use and movements of the hospital vehicle(s) must be firmly controlled by the medical officer.

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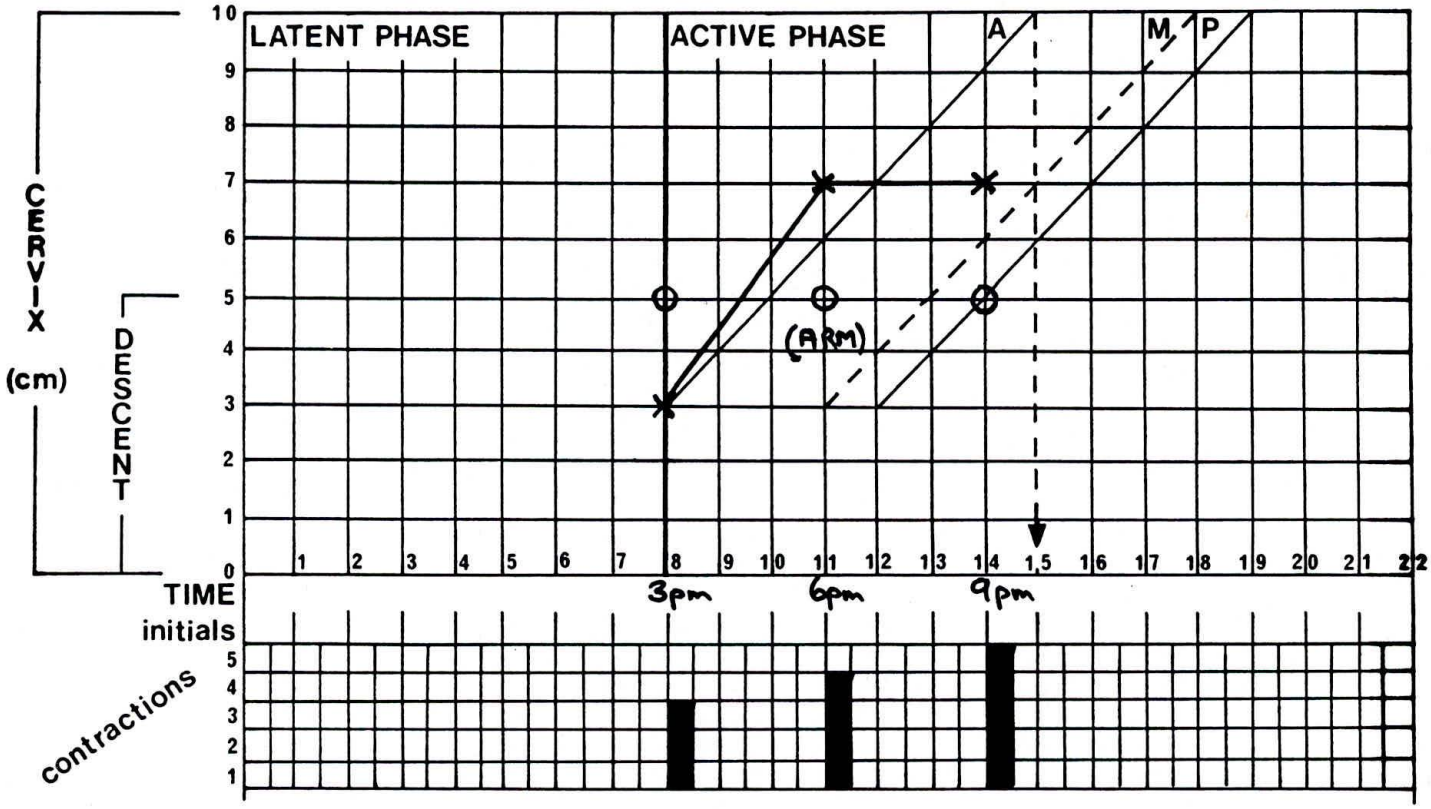
*Question 2.11*

*i) Write down the main point(s) each labourgraph illustrates.*
*ii) What management decision should be made at the time of the last assessment?*

Labourgraph A: Gravida 3, para 2.

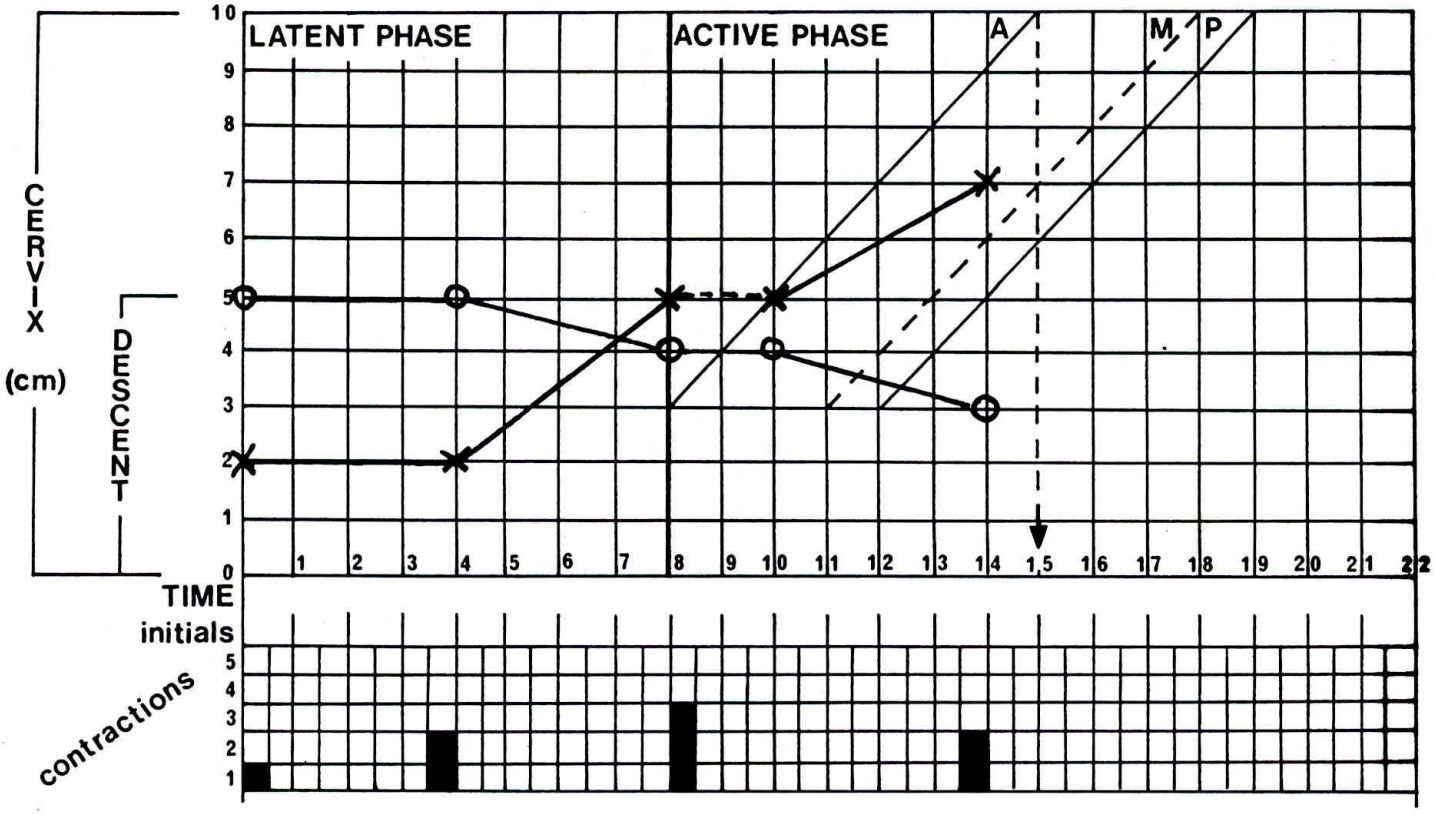



**Labourgraph 'A'**

i) This illustrates secondary arrest in a multiparous woman. Labour has progressed normally to 7 cm and then despite strong, frequent contractions for three hours there has been no progress.

ii) The management is:
- At a rural hospital arrange urgent transfer; this is the sort of woman who will have a ruptured uterus.
- At the district hospital ask senior staff to assess, but really there is no choice but to proceed to an urgent LSCS.

Labourgraph B: Primigravida




**Labourgraph 'B'**

i) This labourgraph is an example of how the graph is transferred to the alert line at the third vaginal examination as the woman is in active labour. The next vaginal examination shows she has gone to the right of the alert line. This means she is not progressing normally.

ii) The management is assessment by a senior midwife or doctor. Providing the pelvis is thought to be adequate and the fetal heart satisfactory the labour should be stimulated using oxytocin.

## CONCLUSION TO PROBLEM 2

You have now completed Unit 2 of this module. I hope you will put the ideas for teaching about prevention in this field into practice in your district.

In both Units 1 and 2 we have looked at problems relating to obstructed labour in general terms, in a way which would apply equally well to all doctors working in isolated conditions with poor resources. However, you will have in your district additional problems only to be faced by you and your co-workers. Some of these problems will be produced by the people themselves, some will be due to the geography of the area and some will be due to the lack of specific resources, not only medical resources but resources such as communication or petrol supplies. Therefore any plans which you develop to improve the maternity service must take account of these factors.

In the last unit of this module you will be looking at some of the factors which directly influence the prevalence and outcome of obstructed labour in your district. This subject is called epidemiology. You may remember epidemiology from your student days as less exciting than the clinical subjects. I believe that by working through Unit 3 you will find epidemiology is all about those matters which directly affect your daily clinical work and that it is a vitally important subject for the District Medical Officer organising the district's health service.

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# UNIT 3

# Epidemiology

# ANSWERS TO PROBLEM 1

*Question 1.1*

*Write down definitions of the following terms.*

- *Maternal mortality rate*
- *Stillbirth rate*
- *Perinatal mortality*
- *Birth rate.*

Definitions

- **Maternal mortality rate** is the number of maternal deaths occurring in pregnancy and in the puerperium up to the end of the sixth week, per 1000 total births.

- **Stillbirth rate** is the number of deliveries of dead infants after 28 weeks of pregnancy, occurring during one year in every 1000 total births (live and dead births).

- **Perinatal mortality** is the number of stillbirths and infant deaths in the first week of life per 1000 total births (live and dead births). (Although some first week deaths will be due to severe congenital abnormalities, some will be due to prolonged, traumatic, difficult labour and therefore provide a measure of the effectiveness of maternity care).

- **The birth rate** is calculated by relating the total live births in a year to the total population and is recorded as the number of births per 1000 population.

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The first part of the project is to establish the prevalence of obstructed labour and its complications in your district.

*Question 1.2*

*Write down two reasons why this will be useful.*

i) These data will serve as a basis for comparison when the programme to improve maternal mortality has been implemented.

ii) The data you collect can be compared with those from other districts. Differences may help point to particular problems in different districts.

*Question 1.3*

*Write a list of the factors which could be studied in your district:*
*i) Factors relating to prevalence;*
*ii) Factors relating to outcome of patients with cephalo-pelvic disproportion.*

i)
- Age.
- Parity.
- Height.
- Ethnic group.

ii)
- Distance from home to maternity unit.
- Distance to maternity unit from the district hospital.
- Local geographical features - terrain, seasonal weather changes.
- Failure by health workers to identify risk factors in antenatal period.
- Failure to use labourgraph correctly.
- Women who have not booked.
- Formal education.

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