

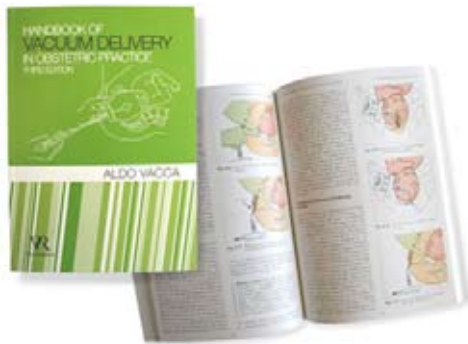
## How to use the case study

The case study is divided into thirty multiple choice questions (MCQs) representing the main steps encountered during a vacuum-assisted delivery. Although the reader's opinion may differ from that of the author regarding the answers to some questions, in all but two of the MCQs, one option per question is considered to be correct. In two of them, more than one choice is acceptable.

The answers to each question, with references to the relevant sections of the Handbook of Vacuum Delivery in Obstetric Practice (3rd ed), are presented at the end of the case study.

The DVD – The Technique of Vacuum-Assisted Delivery focuses entirely on the practical aspects of vacuum extraction and is aimed at clinicians who perform the procedure. Operators will find the material useful as a visual resource to illustrate the steps described in the case study. In addition, essential knowledge and technical skills that are required for safe and successful vacuum delivery are outlined in the content of the DVD. Actual video footage of a vacuum delivery is presented in the program followed by explanatory simulations of the procedure using high-fidelity training manikins.

## Reference Resources:



**HBVD:** Handbook of Vacuum Delivery in Obstetric Practice – 3rd edition



**DVD:** The Technique of Vacuum-Assisted Delivery DVD

The following resources are also available online at [www.vaccaresearch.com](http://www.vaccaresearch.com) through the link Clinician's Resources:

- ESSENTIAL PRE-READING FOR MASTERCLASS IN VAD.pdf
- HANDOUT- Prerequisites and Technique.pdf
- GENERAL KNOWLEDGE MCQ.pdf
- CASE STUDY.pdf
- HANDBOOK REVIEW QUESTIONS.pdf
- THE HISTORY OF VACUUM EXTRACTION –By Professor Tom Baskett.pdf
- A POEM ABOUT VAD –'It's always more posterior than you think'.pdf
- CHOICES WITH CHILDBIRTH GUIDE.pdf

## Clinical Background

CB is a 29 year old nulliparous woman who presented to hospital at 9am in spontaneous labour with ruptured membranes at 39 weeks gestation. Progress during the first stage of labour was normal and the condition of the mother and of the fetus were also assessed to be normal. CB requested and received an epidural anaesthetic for pain relief during the labour when the cervix was 5cm dilated. At 10.30pm the cervix was noted to be completely dilated. Electronic monitoring suggested the fetal condition was normal.

At 11.30pm CB was involuntarily pushing with contractions. The fetal heart rate was recorded at 150 beats per minute with occasional variable decelerations present on the fetal monitoring trace. In addition, the amniotic fluid was lightly stained with fresh meconium. Contractions were assessed as strong with a frequency of 3-4 minutes and lasting about 60 seconds. The level of the fetal head was assessed abdominally to be '1/5th' and, on subsequent vaginal examination was noted to be engaged at 0cm station. There was moderate caput and a slight degree of moulding of the head. Position was judged to be left occipitoposterior (LOP) with some deflexion and slight asynclitism of the head present. A fetal scalp blood pH measured from a sample obtained at 11.35pm was 7.28.

1. Having assessed the clinical circumstances your subsequent management would be:
  - a. review in one hour; anticipate normal delivery
  - b. review in one hour; anticipate vacuum delivery
  - c. review in one hour; anticipate caesarean delivery
  - d. consider immediate delivery by vacuum extraction
  - e. consider immediate delivery by caesarean section.

## Clinical review

Delivery of the baby had not occurred by 1.00am. CB had been pushing with contractions for over 1 hour. The contractions were strong, occurring every 3-4 minutes and lasting 40-60 seconds. However, CB stated that she was feeling "exhausted" and requested assistance with the delivery. On examination, the amniotic fluid was lightly meconium stained and a variable deceleration pattern persisted on the fetal monitoring trace with a baseline heart rate of 148 beats per minute. Scalp blood sampling had been repeated at 12.45am and the pH was reported to be 7.31. No fetal head was palpable abdominally and station was assessed to be at +2cm below ischial spines. The position was still LOP with deflexion and slight asynclitism present. There was a moderate amount of caput and the degree of moulding of the head was slight.

2. Having assessed the clinical circumstances your management would be:
  - a. review in one hour; anticipate normal delivery
  - b. review in one hour anticipate vacuum delivery
  - c. review in one hour anticipate caesarean delivery
  - d. consider immediate delivery by vacuum extraction
  - e. consider immediate delivery by caesarean section.
  
3. Having evaluated the selection variables your assessment of the obstetric circumstances with regard to suitability for vacuum delivery is:
  - a. patient is suitable for vacuum delivery classified as an outlet procedure
  - b. patient is suitable for non-rotational vacuum delivery classified as a low procedure
  - c. patient is suitable for rotational vacuum delivery classified as a low procedure
  - d. patient is suitable for rotational vacuum delivery classified as a mid cavity procedure
  - e. patient is suitable for vacuum delivery classified as a "trial" procedure
  - f. patient is not suitable for vacuum delivery.

4. The vacuum delivery is classified as a low pelvic procedure because:
  - a. the fetal head is judged to be engaged
  - b. the fetal head is in occipitoposterior position
  - c. the presenting part is at +2cm station below ischial spines
  - d. the presenting part is not visible between contractions
  - e. the presenting part is not visible during contractions.
  
5. For vacuum delivery, the recommended maternal position is:
  - a. dorsal position with the end of the bed lowered
  - b. modified lithotomy position with some lateral tilting
  - c. left or right lateral position
  - d. sitting position in a birthing chair or stool
  - e. semi-squatting position supported on each side by birth attendants
  
6. In this patient, additional analgesia for vacuum delivery should be provided by:
  - a. nitrus oxide and oxygen inhalation
  - b. perineal infiltration with a local anaesthetic solution
  - c. pudendal nerve block
  - d. topping-up of the epidural nerve block
  - e. general anaesthesia.
  
7. When the fetal head is stationed in the low pelvis, and the position is LOP the flexion point is most likely to be located:
  - a. on the presenting part within the introitus
  - b. midway between the middle of the introitus and the left ischial tuberosity
  - c. in the sacral cavity near the mother's midline pelvic axis about 3/4 (8cm) of a finger length from the posterior fourchette
  - d. in the sacral cavity slightly to the mother's left of midline about 1/2 (5cm) of a finger length from the posterior fourchette
  - e. against the left pelvic side wall about half a finger's length from the posterior fourchette
  
8. For rotational low pelvic vacuum delivery, which type of cup(s) should you select for the procedure:
  - a. one of the soft plastic cups
  - b. one of the soft silicone cups
  - c. one of the Malmstrom-type rigid cups (metal or plastic)
  - d. one of the Bird-type anterior metal cups
  - e. one of the posterior cups (metal or plastic)
  
9. For this LOP vacuum delivery, after the cup has been inserted through the introitus and a check has been made to exclude maternal tissue entrapment, the cup should be manoeuvred:
  - a. until it is over the posterior fontanelle
  - b. laterally towards the left ischial tuberosity
  - c. posteriorly towards the sacrum, slightly to your right of midline, a distance of 5-6cm
  - d. posteriorly towards the sacrum in the midline pelvic axis, a distance of 8-9cm
  - e. until it is on the vertex presenting within the introitus.

10. The operator can confirm that the cup is correctly positioned on the fetal scalp when:
  - a. the cup covers the posterior fontanelle
  - b. the cup straddles the sagittal suture, 3cm from the posterior fontanelle
  - c. the cup straddles the sagittal suture, 3cm from the anterior fontanelle
  - d. the cup avoids all suture lines and fontanelles to minimise scalp injury
  - e. the head is seen to descend with the first pull.
  
11. In this case, if the operator uses any of the other cups or has not been trained in the use of a posterior cup, what type of cup application on the fetal scalp is likely to be achieved (draw a diagram of position of the head):
  - a. flexing median application
  - b. flexing paramedian application on the left parietal bone
  - c. flexing paramedian application on the right parietal bone
  - d. deflexing median application
  - e. deflexing paramedian application on the left parietal bone
  - f. deflexing paramedian application on the right parietal bone.
  
12. When you are satisfied that the cup has been correctly positioned over the flexion point, the working vacuum pressure may be induced:
  - a. rapidly as a one step procedure
  - b. in a series of steps over 2 minutes
  - c. in a series of steps over 3 minutes
  - d. in a series of steps over 5 minutes
  - e. in a series of steps over 8-10 minutes.
  
13. When the working vacuum pressure level has been achieved, traction may be commenced:
  - a. immediately, with a contraction
  - b. after 1 minute, with a contraction
  - c. after 2 minutes, with a contraction
  - d. after 3 minutes, with a contraction
  - e. after 5 minutes, with a contraction.
  
14. During a low-pelvic rotational vacuum delivery the non-pulling hand:
  - a. monitors descent of the head during traction
  - b. controls the amount of traction force exerted on the fetal scalp
  - c. presses the head towards the sacrum to assist with axis traction
  - d. presses the cup against the fetal scalp to help prevent detachment
  - e. remains applied to the cup and fetal head until the head has delivered
  - f. all of the above.
  
15. Traction for vacuum extraction should be applied:
  - a. in a series of short pulls whenever the woman is pushing
  - b. at the start of a contraction and maintained for the duration of the contraction
  - c. during a contraction, synchronous with maternal expulsive effort
  - d. as a series of rocking movements from side to side to assist descent of the head
  - e. continuously, independent of uterine contractions to keep the head applied to the pelvic floor muscles.

16. In this woman, the number of pulls you would expect for delivery to be completed or to be imminent are:
- 1-2 pulls
  - 2-3 pulls
  - 3-4 pulls
  - 4-5 pulls
  - 5-6 pulls.
17. For rotational vacuum delivery, the first pull on the cup should be directed:
- upwards at an angle of 45 degrees to the horizontal
  - horizontally until the head has crowned then upwards
  - downwards of an angle of 45 degrees to the horizontal
  - almost vertically downwards to the floor
  - at right angles to the body of the cup.
18. With rotational vacuum delivery, lengthening of the tube or traction cord outside the vagina during the first pull is an indication that:
- descent of the presenting part has occurred
  - flexion of the head and correction of asynclitism has occurred
  - the head has undergone increased moulding
  - the cup has begun to detach from the scalp
  - auto-rotation has occurred.
19. In the interval between contractions the operator should:
- check for maternal tissue entrapment under the cup
  - inform the mother of progress and offer encouragement and advice
  - inform the mother of the transient nature of the chignon and cup marking on the baby's scalp
  - decrease the vacuum pressure from 80kPa to 20kPa
  - monitor the fetal heart rate
  - maintain traction to keep the fetal head on the pelvic floor.
20. With rotational vacuum delivery, the direction of traction with the second pull should be:
- upwards at an angle of 45 degrees to the horizontal
  - horizontally until the head has crowned then upwards
  - downwards at an angle of 45 degrees to the horizontal
  - downwards almost vertically towards the floor
  - at right angles to the body of the cup.
21. With rotational vacuum delivery, anterior rotation of the fetal head occurs:
- by manually rotating the head with the non-pulling hand
  - by digitally rotating the cup itself during traction
  - by physically rotating the handle of the vacuum cup
  - automatically if traction is directed upwards to alter the attitude of the head
  - automatically if traction is directed downwards initially in the midline.

22. The operator confirms that anterior rotation (auto-rotation) is occurring by:
- digital examination of the posterior fontanelle
  - digital examination of the anterior fontanelle
  - noting a shift in position of the suction tube (or its recessed groove) to one or other side
  - noting a twist in the traction cord or chain
  - noting a lessening in the traction force requirements.
23. As the cup becomes visible in the introitus, the direction of the traction should be:
- upwards, at an angle of 45 degrees to the horizontal
  - horizontally or slightly downwards until the head has crowned
  - downwards at an angle of 45 degrees to the horizontal
  - downwards almost vertically towards the floor
  - at right angles to the body of the cup.
24. The operator confirms that progress is occurring by:
- noting an increase in visible length of the traction cord outside the introitus
  - noting descent of the vacuum cup
  - observing auto-rotation of the fetal head
  - observing descent of the fetal scalp
  - feeling descent of the head with the index finger of the non-pulling hand.
25. When the cup has emerged through the introitus, the direction of traction should be:
- upwards at an angle of 45 degrees to the horizontal
  - horizontally until the head has crowned, then upwards
  - downwards at an angle of 45 degrees to the horizontal
  - downwards almost vertically towards the floor
  - at right angles to the body of the cup.
26. For rotational vacuum delivery, episiotomy should be performed:
- routinely to achieve correct direction of traction
  - when the fetal head descends to the level of the pelvic floor
  - when the fetal head distends the perineum
  - when the perineum begins to tear
  - for delayed progress over the perineum
  - episiotomy is not usually required for vacuum delivery.
27. With rotational vacuum delivery, you should release the pressure and remove the cup from the fetal head:
- when the head has rotated to the occipitoanterior position
  - when it is obvious that vaginal delivery will occur without further assistance
  - when the head has crowned
  - when the fetal head has been delivered
  - after the baby has been delivered.

28. You should routinely check for injury to the fetal scalp:
- after the delivery of the baby
  - after the delivery of the placenta or suture of the episiotomy
  - after completion of the case records and data form
  - at one hour following the delivery
  - at 12-24 hours following the delivery in the presence of the mother.
29. If the vacuum delivery was difficult or the attempt was unsuccessful, the baby's scalp should be re-examined:
- after completion of the case records and data form
  - every hour following the delivery for 4 hours then 4 hourly for 24 hours
  - every 4 hours following the delivery for 12 hours
  - after 12-24 hours in the mothers presence
  - prior to discharge from the hospital.
30. The operator should routinely check the baby's scalp and cup application site in the presence of the mother:
- after completion of the case records and data form
  - after one hour following the vacuum delivery
  - after 4 hours following the delivery
  - after 12-24 hours following the delivery
  - prior to discharge from the hospital.

## Answers to vacuum delivery Case study

- Q1. The answer is: a  
*Page & figure ref: 34, 40, Fig 3.1*
- Q2. The answer is: d  
*Page & figure ref: 34, 40, Table 3.5*
- Q3. The answer is: c  
*Page & figure ref: 36, 40, Table 3.3, Table 3.5*
- Q4. The answer is: c  
*Page & figure ref: 35, Fig 3.1 Table 3.3*
- Q5. The answer is: b  
*Page & figure ref: 44*
- Q6. The answer is: b  
*Page & figure ref: 43*
- Q7. The answer is: c  
*Page & figure ref: 18, Fig 2.14b, Table 2.20*
- Q8. The answer is: e  
*Page & figure ref: 3, 5, 26, 67, Table 2.1*

- Q9. The answer is: d  
*Page & figure ref: 68, Fig 2.20*
- Q10. The answer is: c  
*Page & figure ref: 22, Fig 2.27*
- Q11. The answer is: f  
*Page & figure ref: 24, Fig 2.28*
- Q12. The answer is: a  
*Page & figure ref: 50*
- Q13. The answer is: b  
*Page & figure ref: 50*
- Q14. The answer is: f  
*Page & figure ref: 52, Fig 5.4*
- Q15. The answer is: c  
*Page & figure ref: 52, Fig 5.6*
- Q16. The answer is: d  
*Page & figure ref: 86, 88, Fig 7.2*
- Q17. The answer is: d  
*Page & figure ref: 51, 70, Fig 2.34a*
- Q18. The answer is: b  
*Page & figure ref: 53, 70, Fig 6.8h, Fig 6.8i*
- Q19. The answer is: b, c, e  
*Page & figure ref: 52*
- Q20. The answer is: c  
*Page & figure ref: 51, 70, Fig 2.34b*
- Q21. The answer is: e  
*Page & figure ref: 78, Fig 6.8h, Fig 6.8j*
- Q22. The answer is: c  
*Page & figure ref: 78, Fig 6.22*
- Q23. The answer is: b  
*Page & figure ref: 51, 70, Fig 2.34c*
- Q24. The answer is: a, b, c, d, e  
*Page & figure ref: 53*
- Q25. The answer is: b  
*Page & figure ref: 70, Fig 2.34d, Fig 2.34e*
- Q26. The answer is: e  
*Page & figure ref: 104*

- Q27. The answer is: d  
*Page & figure ref: 54*
- Q28. The answer is: b  
*Page & figure ref: 54*
- Q29. The answer is: b  
*Page & figure ref: 54, 100*
- Q30. The answer is: d  
*Page & figure ref: 54*

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