Instrumental Vaginal Delivery When and How?

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Operative Vaginal Delivery

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4.3 When should operative vaginal delivery be offered?

Table 2. Indications for operative vaginal deliverv²⁴

Operators should be aware that no indication is absolute and should be able to distinguish 'standard' from 'special' indications.

A vacuum extractor should not be used at gestations of less than 34 weeks +o days. The safety of vacuum extraction at between 34 weeks +o days and 36 weeks +o days of gestation is uncertain and should therefore be used with caution.

Туре	Indication
Fetal	Presumed fetal compromise (see text)
Maternal	To shorten and reduce the effects of the second stage of labour on medical conditions (e.g. cardiac disease Class III or IV*, hypertensive crises, myasthenia gravis, spinal cord injury patients at risk of autonomic dysreflexia, proliferative retinopathy)
Inadequate progress	Nulliparous women – lack of continuing progress for 3 hours (total of active and passive second-stage labour)17 with regional anaesthesia, or 2 hours without regional anaesthesia
	Multiparous women – lack of continuing progress for 2 hours (total of active and passive second-stage labour)17 with regional anaesthesia, or 1 hour without regional anaesthesia
	Maternal fatigue/exhaustion

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ASSISTANCE IN SECOND STAGE

Non reassuring Fetal status Prolonged Second Stage Maternal conditions/ exhaustion

BW/ Shoulder Dystocia

HOW – FIRST ASSESSMENT OF SECOND STAGE

- **Fetal Condition**
- **Uterine Contractions**
- Caput and Moulding
- Descent of Head Abdominal Head Level/station
- Position of Head and Degree of Flexion
- Size of Pelvis
- Descent With Contraction and Bearing down effort

SECOND STAGE FHR PATTERNS

*Prolonged bradycardia

*Prolonged decelerations (depth to < 80 bpm), lasting >90 secs and recovery to baseline <30 secs *Deceleration pattern with loss of baseline variability - flat trace – if associated with reduction in BL rate – sudden bradycardia

*Deceleration – associated with rise in base line rate

IVD FOR SUSPECT FETAL COMPROMISE

Cord arterial pH and blood gases

Apgar score at 1 and 5 min

IVD ESSENTIALS

IV Line Blood for group and save /cross-match Consent form Proper positioning Do not underestimate blood loss Do not hesitate to abandon, ask for assistance, give blood/antibiotics

FORCEPS

Fetal head - < 1/5th palpable Not excessive moulding Adequate analgesia **Experienced** Obstetrician When in doubt - Trial in theatre Intention - to abandon Moderate traction - 3 contractions

Table 1. Classification for operative vaginal delivery

Outlet Fetal scalp visible without separating the labia

Fetal skull has reached the pelvic floor

Sagittal suture is in the anterio-posterior diameter or right or left occiput anterior or posterior position (rotation does not exceed 45°) Fetal head is at or on the perineum

- Low Leading point of the skull (not caput) is at station plus 2 cm or more and not on the pelvic floor Two subdivisions:
 - rotation of 45° or less from the occipito-anterior position
 - rotation of more than 45° including the occipito-posterior position
- Mid Fetal head is no more than 1/5th palpable per abdomen

Leading point of the skull is above station plus 2 cm but not above the ischial spines

Two subdivisions:

- rotation of 45° or less from the occipito-anterior position
- rotation of more than 45° including the occipito-posterior position
- **High** Not included in the classification as operative vaginal delivery is not recommended in this situation where the head is 2/5th or more palpable abdominally and the presenting part is above the level of the ischial spines

Adapted from the American College of Obstetrics and Gynecology, 2000²³































Sagittal suture is perpendicular to the shank Distance between heel of blade and head is one finger breadth on either side The occiput is three cms above the shank

> Bimalar-bitemporal application Direction of pull through flexion point

FP- FLENION POINT

APPLICATION OF FORCEPS

Both blades should sit horizontally Oblique position of one blade suggests asynclitism and or malposition Forceful application - vaginal tears, nerve palsies (e.g. phrenic, brachial plexus) Forceful locking -? Mal-application on occipito frontal diameter - fracture of skull






























Occipito frontal























Vacuum or Forceps -Whose choice P









Mityvac[®] Vacuum Extractor Cups

Assertion Position for Standard & MillySoff" cups

Standard Cup with Pearl Edge Lip #004M

MitySoft" Cup MO20M

Universal Vacuum Release allows the user to control the release of vacuum at the cup." Intertion Position for "M" Style Cup

"M" Style Cup . #007M





















TRIAL OF FORCEPS/ Vacuum

Intention - to abandon forceps/Vacuum
e.g. failure in application, locking, rotation, descent with traction
Descent with first bearing down effort and traction should prompt likely outcome

"Taming of a lion" - Ian Donald

TRIAL OF FORCEPS/ Vacuum

No. of failed / Abandoned forceps
Step at which the instrument was abandoned
Procedure in OT - staff and anaesthetist ready for CS within mins
Patient well informed

IVD - EPISIOTOMY

Shorter the perineum - more mediolateral the incision

- Higher the presenting part higher the apex of the incision
- Avoid distension of vagina causing spiral tears, apical extensions or isolated vault tears
- Beware of button hole tears

THIRD DEGREE PERINEAL TEARS AND MEDIOLATERAL EPISITOMY

- Multivariate analysis birth weight, forceps delivery, induced labour, epidural anaesthesia and parity
- Nulliparae are at higher risk
- Mediolateral sphincter saving (esp. in nulliparae) and prevent chronic faecal incontinence

Br J Obstet Gynaecol 1997: 104: 563

EPISIOTOMY - VAULT TEARS Good light, retractors, assistants Infiltration of vasopressin beneath and beyond the edges of vaginal wound Interrupted haemostatic sutures - vaginal skin of one or both sides Raw area heals well if interrupted sutures placed for either side Stay sutures on one side & tied – then the other side and tied. Traction to allow visualisation of apex

UNRECOGNISED TRAUMA

Rectal mucosa/anal sphincter Early repair is best Good exposure, good light, good assistance **Experienced** person Double layer closure of rectum Repair of retracted sphincter

PPH and IVD

Usually IVD follows long labour

Atonic and traumatic PPH

Avoid bleeding from above

IS THE VACUUM EXTRACTOR THE INSTRUMENT OF FIRST CHOICE?

Use of forceps as first choice-12,000 unnecessary pudendal blocks/regional anaesthesia: 10,000 women experience moderate to severe pain unnecessarily; 5,000 more women with severe perineal or vaginal trauma than used to be; 3,500 women suffer unnecessarily from severe pain for several days after delivery. (UK - 5,000 women require IVD every year) Obstetric vacuum extractor is the instrument of first choice

Chalmers & Chalmers, 1989

IS THE VACUUM EXTRACTOR THE INSTRUMENT OF FIRST CHOICE?

- In well selected cases performed by Senior Obstetricians, head rotation can be affected (auto rotation) *Low et al*, 1993
- No detriment caused by vacuum. *Johanson* et al, 1993
- Forceps delivery caused more maternal injury than vacuum extraction. *Vacca et al*, 1983

CHOICE AND INSTRUMENTAL DELIVERY

Women's point of view:

- What is my chance of a normal delivery?
- Will my IVD be done by an expert?
- What is the chance of IVD damaging me or my baby?

Drife. Br J O&G, 1996: 103: 608
SHOULDER DYSTOCIA AND OPERATIVE VAGINAL DELIVERY

Randomised - Forceps n=315 & M-cup n=322 21 had shoulder dystocia in both groups (3.3%) No significance: epidural analgesia, station, previous vaginal delivery, fetal gender, indication of IVD, >45° rotation, episiotomy, maternal weight, diabetes Nearly attaining significance: randomised to vacuum

Bofill et al. J Mat. Fet. Med. 1997: 4: 220

IS THERE A BENEFIT TO EPISIOTOMY AT OVD?

 Significant reduction in episiotomy for OVD was not associated with change in rate of 3° tears

 There was increase in rate of vaginal lacerations, but decrease in 4° tears

OCCULT ANAL SPHINCTER TRAUMA FOLLOWING RANDOMISED FORCEPS AND VACUUM DELIVERY

- 5 Years after randomisation anal endosonography and manometry showed defect in 44 of 313 women
- 82% of forceps and 48% of vacuum delivery had occult sphincter defects
- Significant fall in maximum squeeze pressure in forceps group (56 Vs 36mm Hg þ=0.0007)
- Twice as many in forceps group suffered anal incontinence (32% Vs 16% but no significance reached)
- Large prospective study is needed

Int. J O&G, 1998: 61: 113

FAILED TRIAL OF VACUUM OR FORCEPS - MATERNAL AND FETAL OUCOME

- Morbidity with failed trial Vs Direct CS during second stage of labour
- All second stage CS 1986-92 (total births = 29,457)

401 - 326 direct CS and 75 failed IVD
(75 = 33 forceps, 25 vacuum and 17 both)
Failed IVD - followed by CS - morbidity
not increased to mother or baby

5.4 When should operative vaginal delivery be abandoned?

Operative vaginal delivery should not be attempted unless the criteria for safe delivery have been met (see Table 3).

Operative vaginal delivery should be abandoned where there is no evidence of progressive descent with moderate traction during each contraction or where delivery is not imminent following three contractions of a correctly applied instrument by an experienced operator.

Adverse outcomes, including unsuccessful forceps or vacuum delivery, should trigger an incident report as part of effective risk management processes.

5.5 Is there a place for sequential use of instruments?

The use of sequential instruments is associated with an increased risk of trauma to the infant; however, the operator must balance the risks of a caesarean section following failed vacuum extraction with the risks of forceps delivery following failed vacuum extraction.

Obstetricians should be aware of increased neonatal morbidity with failed operative vaginal delivery and/or sequential use of instruments and should inform the neonatologist when this occurs to ensure appropriate management of the baby.



В

LITIGATION RELATED TO ASSISTED VAGINAL DELIVERY

Attempting vaginal delivery when:

- Mechanical warning signs are ignored/ misinterpreted (size of pelvis, fetus, partogram late 1st stage)
- Basic rules are disregarded

(Assessing head position, station and fetal ear)

• Fetal compromise

Delivery undertaken by too junior or inexperienced doctors Repeated attempts at delivery by junior doctors Delay in decision to delivery interval

INTERVENTION STRATEGIES TO REDUCE BIRTH TRAUMA

Protocols and guidelines

Regular ward rounds and availability of senior obstetrician

Identification of high risk cases

Education and training

Vacuum or Forceps -Whose choice P





Winse choice ?



NEONATAL SUBGALEAL HAEMATOMA : ASSOCIATED RISK FACTORS, COMPLICATIONS AND OUTCOME (N=37)

All except one had IVD 89% had vacuum cf 10% of births Increased risk of failed vacuum (45% had forceps as well)

Intracranial haemorrhage, skull fracture and cerebral oedema (40%)

Neonatal encephalopathy (73%) - not correlated to severity of SGH

Hypovolaemia and coagulopathy was common *Chadwick et al. J Paed Child Hlth, 1996, 32: 228*

Augmentation of Labour - Mode of Delivery Related to Cervimetric Progress

Table 3. Prerequisites for operative vaginal delivery

Full abdominal and	Head is ≤1/5th palpable per abdomen
vaginal examination	Vertex presentation.
	Cervix is fully dilated and the membranes ruptured.
	Exact position of the head can be determined so proper placement of the instrument can be achieved.
	Assessment of caput and moulding.
	Pelvis is deemed adequate. Irreducible moulding may indicate cephalo-pelvic disproportion.
Preparation of mother	Clear explanation should be given and informed consent obtained.
	Appropriate analgesia is in place for mid-cavity rotational deliveries. This will usually be a regional block. A pudendal block may be appropriate, particularly in the context of urgent delivery.
	Maternal bladder has been emptied recently. In-dwelling catheter should be removed or balloon deflated.
	Aseptic technique.
Preparation of staff	Operator must have the knowledge, experience and skill necessary.
	Adequate facilities are available (appropriate equipment, bed, lighting).
	Back-up plan in place in case of failure to deliver. When conducting mid-cavity deliveries, theatre staff should be immediately available to allow a caesarean section to be performed without delay (less than 30 minutes). A senior obstetrician competent in performing mid-cavity deliveries should be present if a junior trainee is performing the delivery.
	Anticipation of complications that may arise (e.g. shoulder dystocia, postpartum haemorrhage)
	Personnel present that are trained in neonatal resuscitation

4.5 What type of consent is required?

Women should be informed in the antenatal period about operative vaginal delivery, especially during their first pregnancy.

For deliveries in the delivery room, verbal consent should be obtained before an operative vaginal delivery and the discussion documented in the notes. If circumstances allow, written consent may also be obtained.

5.1 Who should perform operative vaginal delivery?

An operative vaginal delivery should be performed by an operator who has the knowledge, experience and skills necessary to assess and to use the instruments and manage complications that may arise.

Obstetricians should achieve experience in spontaneous vertex delivery before commencing training in operative vaginal delivery.

Obstetric trainees should receive appropriate training in operative vaginal delivery. Competency should be achieved before conducting unsupervised deliveries and should be monitored regularly thereafter.

An experienced operator, competent at mid-cavity deliveries, should be present from the outset for all attempts at rotational or mid-cavity operative vaginal delivery.

5.2 Where should operative vaginal delivery take place?

Operative vaginal births that have a higher risk of failure should be considered a trial and conducted in a place where immediate recourse to caesarean section can be undertaken.

Higher rates of failure are associated with:

- maternal body mass index over 30
- estimated fetal weight over 4000 g or clinically big baby
- occipito-posterior position
- mid-cavity delivery or when 1/5th of the head palpable per abdomen.

5.3 What instruments should be used for operative vaginal delivery?

The operator should choose the instrument most appropriate to the clinical circumstances and their level of skill. Forceps and vacuum extraction are associated with different benefits and risks. Failed delivery with selected instrument is more likely with vacuum extraction.

The options available for rotational delivery include Kielland forceps, manual rotation followed by direct traction forceps or rotational vacuum extraction. Rotational deliveries should be performed by experienced operators, with the choice depending on the expertise of the individual operator.

Vacuum extraction compared with forceps is:

- more likely to fail delivery with the selected instrument (OR 1.7; 95% CI 1.3-2.2)
- more likely to be associated with cephalhaematoma (OR 2.4; 95% CI 1.7-3.4)
- more likely to be associated with retinal haemorrhage (OR 2.0; 95% CI 1.3-3.0)
- more likely to be associated with maternal worries about baby (OR 2.2; 95% CI 1.2-3.9)
- less likely to be associated with significant maternal perineal and vaginal trauma (OR 0.4; 95% CI 0.3-0.5)
- no more likely to be associated with delivery by caesarean section (OR 0.6; 95% CI 0.3-1.0)
- no more likely to be associated with low 5-minute Apgar scores (OR 1.7; 95% CI 1.0-2.8)
- no more likely to be associated with the need for phototherapy (OR 1.1; 95% CI 0.7-1.8).

5.6 What is the role of episiotomy for operative vaginal delivery?

In the absence of robust evidence to support routine use of episiotomy in operative vaginal delivery, restrictive use of episiotomy, using the operator's individual judgement, is supported.

5.7 Should prophylactic antibiotics be given?

There are insufficient data to justify the use of prophylactic antibiotics in operative vaginal delivery.

Good standards of hygiene and aseptic techniques are recommended.

6.1 Should thromboprophylaxis be given?

Women should be reassessed after an operative vaginal delivery for risk factors for venous thromboembolism and, if appropriate, thromboprophylaxis should be prescribed.



6.4 How can we reduce psychological morbidity for the mother?

There is no evidence to support the use of midwife-led debriefing in reducing maternal depression following operative vaginal delivery.

The woman should be reviewed prior to hospital discharge to discuss the indication for operative delivery, management of any complications and the prognosis for future deliveries. Best practice would be for the woman to be reviewed by the obstetrician who conducted the delivery.

6.5 How should we advise women for future deliveries?

Women should be encouraged to aim for a spontaneous vaginal delivery in a subsequent pregnancy as there is a high probability of success.

Care should be individualised for women who have sustained a third- or fourth-degree perineal tear.

Audits in IVD

Maternity unit:

rate of operative vaginal delivery.

Maternity unit and individual operator:

- percentage of women with failed operative vaginal delivery
- rate of sequential instrument use
- case notes review to audit appropriate management of women with failed operative vaginal delivery or sequential instrument use, i.e. when to use a sequential instrument and when to abandon
- percentage of women with third- and fourth-degree perineal tears
- rate of neonatal morbidity, composite trauma (subgaleal haemorrhage/brachial plexus injury/fracture/facial nerve palsy/cerebral haemorrhage), low Apgar <7 at 5 minutes and cord arterial pH <7.1
- documentation of written or verbal consent for operative vaginal delivery
- documentation of written consent for trial of operative vaginal delivery in operating theatre
- accuracy of documentation.





Submento bregmatic

Error Producing Conditions (William, 1988) – Need for OSATs

Condition	<u>Risk Factor</u>
Unfamiliarity with task	x17
Time shortage	x11
Information overload	хб
Misperception of risk	x4
Poor feedback from system	x4
Inexperience	x3
Poor instructions	x3
Inadequate checking	x3
Disturbed sleep patterns	x1.6
Hostile environment	x1.2

Unfamiliarity with the task – No supervision –



Future > Adequate supervision > proper assessment (OSATS) > Safety

Objective structured assessment of technical skills (OSATS)

- Opening and closing the abdomen
- Caesarean section (of varying levels of complexity)
- Assisted vaginal delivery
- Fetal blood sampling
- Perineal repair
- Manual removal of placenta
- Diagnostic laparoscopy
- Operative laparoscopy
- Hysteroscopy
- **ERPC**

OPENING AND CLOSING THE ABDOMEN

Trainee Name:			StR Year:			Date	
Assessor Name:	Name:		Post				
Clinical details of difficulty of case	f complexity/						

	Performed independently	Needs help		
	PLEASE TICK RELEVANT BOX			
Items under observation: opening				
Appropriate preoperative preparation: bladder empty, prepare and drape abdomen				
Appropriate skin incision (e.g. length, position) with safe use of surgical knife				
Subcutaneous fascia opened with attention to haemostasis				
Rectus sheath incised either side of linea alba, extended with scissors and dissected off rectus musde with attention to haemostasis				
Safe entry of peritoneal cavity by either sharp or blunt dissection				
Item under observation: closing				
Identification of peritoneal edge and closure (optional) using appropriate suture material, instruments and technique				
Ensure haemostasis of peritoneum and posterior surface of rectus sheath				
Secure dosure of rectus sheath using appropriate suture material, instruments and technique for knot tying and placement of sutures				
Ensure haemostasis before skin closure				
Accurate skin closure using appropriate method, instruments and technique (trainees should demonstrate competence in the full range of closure methods)				
Appropriate and safe use of needle holder: needle baded correctly, no touch technique, no inappropriate movements				
Comments (please state skin closure method)				

Examples of minimum levels of complexity for each stage of training

BasicTraining	patient with no previous lower transverse incision
Intermediate Training	patient with previous lower transverse incision but without suspicion of severe abdominal adhesions
Advanced	patient with previous abdominal surgery and likely severe abdominal adhesions

OSATS

Asynclitism The Sagittal Suture is lying behind the Symphysis Pubis..

mm





-Forceps of the type known as Graily Hewitt's ordinary forceps, introduced in 1861. (In the Wellcome Historical Medical Museum.)



-The obstetrical forceps of Lazarewitsch of Kharkoff (1866). From Mathieu's Catalogue of 1890. (Drawn from a photograph supplied by Wellcome Historical Medical Museum.)



-McFerran's forceps (1884). From the American armentarium chirurgicum of George Teimann, New York (1889). (Drawn from a photograph supplied by Wellcome Historical Medical Museum.)



-Boryakovsky's forceps (1889). (From Das, Obstetric Forceps, The Art Press, Calcutta.)

DEEPLY ENGAGED HEAD

Problem of deeply engaged head – Breech extraction

Alternative to pushing from below or extracting from above

Excludes pressure on head especially in preterm fetuses

MID FORCEPS

Head is engaged but skull above station +2
Special circumstances - sudden onset of severe maternal or fetal compromise
Simultaneously prepare for CS
Do not attempt - unengaged head, cervix not completely dilated

OUTLET FORCEPS

Scalp is visible at the introitus without separating the labiaThe fetal skull has reached the pelvic floorThe sagittal suture is in the anterior posterior diameter in the DOA, ROA, LOA or DOP position

Fetal head is at or on the perineum

COCHRANE DATABASE OF SYSTEMIC REVIEWS ISSUE 4 - 1998

Vacuum Vs. forceps

- Significantly less maternal trauma
- Less general and regional anaesthesia
- Overall fewer CS in vacuum group
- Increase in neonatal cephal-haematoma
- Serious neonatal injury uncommon with either instrument