

# INSTRUMENTAL DELIVERIES

## ■ Definition

- Delivery of a baby vaginally using an instrument for assistance.(ventose or forcepse)
- Prevalence
- In the UK, approximately 12 per cent of deliveries are assisted with forceps/ventouse. The incidence of instrumental intervention varies widely both within and between countries and may be performed as infrequently as 1.5 per cent, or as often as 26 per cent.

- these differences are often related to variations in
- labour ward management.
- Many different strategies have been suggested and
- employed to help lower the rates of assisted delivery.
- A few of these are evidence based:
  - • provision of a caregiver in labour;
  - • active management of the second stage with syntocinon in nulliparous women with epidural analgesia;
  - • delayed pushing in nulliparous women with epidural analgesia.
- Other techniques that are commonly used but have
- no evidence to support their usage are upright
- positions in labour and allowing epidural analgesia

concerning malpositions of the fetal head (occipito-transverse and occipito-posterior). Such positions occur more frequently with regional anaesthesia as a consequence of alterations in the tone of the pelvic floor that impede spontaneous rotation to the optimal occipito-anterior position. Epidural analgesia has been shown to be associated with longer first and second stages of labour, increased incidence of fetal malposition, increased use of oxytocin and increased incidence of instrumental vaginal deliveries. It is possible that the increasing incidence of instrumental deliveries may reflect the rising demand for regional anaesthesia

**Fetal distress is a commonly cited indication** for instrumental intervention, although it is infrequently the fetus that is actually distressed. 'Presumed fetal compromise' is a better term, especially when employed in conjunction with a precise description of the situation surrounding the intervention

- The use of elective instrumental intervention

for infants of reduced weight is more controversial. In infants of less than 1.5 kg, delivery with forceps offers no advantage over spontaneous delivery and may increase the incidence of intracranial haemorrhage. Ventouse carries the same risks, but in addition should be avoided in infants of less than 35 completed weeks

# Maternal

- The most common maternal indications for intervention are those of maternal distress, exhaustion or undue prolongation of the second stage of labour. Labour may be deemed to be prolonged if the second stage lasts 2 hours in a primigravida (3 hours if an epidural is *in situ*), or 1 hour in a multipara (2 hours if an epidural is *in situ*).
- Less common indications include medically significant conditions, such as aortic valve disease with significant outflow obstruction or

## Contraindications

The ventouse should not be used:

- in gestations of less than 35 completed weeks because of the risk of cephalohaematoma and intracranial haemorrhage.
- face or breech presentation.

There is minimal risk of fetal haemorrhage if the vacuum extractor is employed following fetal blood sampling or application of a spiral scalp electrode; no excess bleeding was reported in two randomized trials comparing deliveries performed with forceps or ventouse.

Forceps and vacuum extractor deliveries before full dilatation of the cervix are contraindicated, although possible exceptions occurs with the vacuum delivery of a second twin where the cervix has contracted or with a prolapsed cord at 9 cm if rapid



# Instrument choice

The Royal College of Obstetricians and Gynaecologists has issued clinical guidelines regarding the use of instruments to aid vaginal delivery, and has stated that obstetricians should be competent and confident in the use of both forceps and the ventouse; practitioners should use the most appropriate instrument for individual circumstances. The choice of instrument employed by the accoucheur should be based on a combination of indication, experience and training, and the last two of these issues are particularly pertinent, in the context of changes in 'junior doctors' hours' and working practices. It is certainly the case that only adequately trained or supervised practitioners should undertake any vacuum or forceps delivery.

;

The ventouse, when compared to the forceps is significantly more likely to:

- fail to achieve a vaginal delivery;
- be associated with a cephalohaematoma (subperiosteal bleed);
- be associated with retinal haemorrhage

be associated with maternal worries about the baby;

and is significantly less likely to be associated with:

- use of maternal regional/general anaesthesia;
- significant maternal perineal and vaginal

trauma;

- severe perineal pain at 24 hours;

and is equally likely to be associated with:

- delivery by Caesarean section;
- low 5 minute Apgar scores.

The incidence of maternal injuries in deliveries performed with the ventouse is significantly reduced when compared with forceps; anal sphincter injury in particular is twice as common with forceps delivery.

# Basic rules

It has been suggested that failure rates of less than 1 per cent should be achieved with well-maintained apparatus and the use of the correct technique.

However, this is probably an unrealistic target; most studies suggest failure rates of 10–15 per cent. Several factors contribute to delivery failure:

- inadequate initial case assessment – high head, misdiagnosis of the position and attitude

- failure due to traction in the wrong plane;
- poor maternal effort with inadequate use of Syntocinon to aid expulsive efforts in the second stage;
- failure to select the correct ventouse cup type and

# VACUUM /VENTOUSE

---







# prerequisite

- A – Analgesia ⇒ adequate
  - ⇒ appropriate positioning & access
- B – Bladder ⇒ catheterization
- C – Cervix ⇒ fully dilated / membranes ruptured
- D – Determine ⇒ position, station, pelvic adequacy
- E – Equipment ⇒ inspect vacuum cup, pump, tubing,
  - ⇒ check pressure

- F – Fontanelle ⇒ position the cup over the posterior fontan
  - ⇒ -ve pressure ↑ 10 cm H<sub>2</sub>O initially & between cont
  - ⇒ sweep finger around cup to clear maternal tissue
  - ⇒ ↑ pressure to 60 cm H<sub>2</sub>O with the next contraction
- G – Gentle traction ⇒ pull with contractions only
  - ⇒ traction in the axis of the birth canal
  - ⇒ ask the mother to push during cont

- H – Halt    ⇒ halt traction if no progress with three traction aided contractions
  - ⇒ vacuum pops off three times
  - ⇒ pulling for 30 min without significant progress
- I – Incision    ⇒ consider episiotomy if laceration imminent
- J – Jaw    ⇒ remove vacuum when jaw is reachable or delivery assured

# COMPLICATIONS

- Vacuum –assisted delivery is less traumatic to the mother & fetus than forceps
- Maternal ⇒ Vaginal laceration due to entrapment of vaginal mucosa between suction cup & fetal head

# FETAL COMPLICATIONS

- Scalp injuries ⇒ chignon
  - ⇒ abrasion & lacerations 12.6%
  - ⇒ scalp necrosis 0.25-1.8%
- Cephalohematoma ⇒ 25% ⇒ jaundice /anemia
- Intracranial hemorrhage ⇒ 2.5%
- Subgaleal hematoma

# FETAL COMPLICATIONS

- Birth asphyxia  $\Rightarrow$  2.6-12%  $\Rightarrow$  related to extraction force & time

Some studies showed decrease birth asphyxia

- Retinal hemorrhage            50%
  - Forceps                            31%
  - SVD                                 19%
- Neonatal jaundice

# FETAL COMPLICATIONS

- Fetal mortality 15/1000
  - Lower in cases delivered by vacuum 1.9%/ forceps 5.2 %

No long term effects on neurological psychomotor or intellectual development up to 4 years of age

# FORCEPS







# CLASSIFICATION OF FORCEPS DELIVERY

- Outlet forceps ⇒ Scalp visible at the vulva without separating the labia
- Low forceps ⇒ Vertex at +2 station
- Midforceps ⇒ Head is engaged but leading part above +2 station  
⇒ Sagittal suture not in the AP plane of the mother

# CLASSIFICATION OF FORCEPS DELIVERY

- Outlet ⇨ Wrigley's
- Outlet & low forceps ⇨ Simpson /Elliot
- Midforceps & outlet ⇨ Tucker Mclane
- Midforceps & rotation ⇨ Kielland
- After coming head in breech ⇨ Piper

- A – Anesthesia ⇒ adequate / epidural or pudendal  
⇒ appropriate positioning & access
- B – Bladder ⇒ catheterization
- C – Cervix ⇒ fully dilated / membranes ruptured
- D – Determine ⇒ position, station, pelvic adequacy
- E – Equipment ⇒ complete working forceps  
⇒ anesthesia support

■ F – Forceps ⇒phantom application

⇒Lt blade , LT hand, maternal Lt side pencil grip & vertical insertion with Rt thumb directing blade

⇒Rt blade , RT hand, maternal Rt side pencil grip & vertical insertion with Lt thumb directing blade

⇒Lock blades

⇒ Check application:

- Post fontanelle 1cm above the plane of the shanks
- Sagittal suture lies in the midline of the shanks /perpendicular to the plane of the shanks
- The operator can not place more than a fingertip between the fenestration of the blade & the fetal head on either side

- G – Gentle traction ⇒ applied with contraction & maternal expulsive efforts
- H – Handle elevated ⇒ traction in the axis of the birth canal  
⇒ do not elevate handle too early
- I – Incision ⇒ consider episiotomy if laceration imminent
- J – Jaw ⇒ remove forceps when jaw is reachable or delivery assured



# COMPLICATIONS

- Maternal ⇒ trauma to soft tissue ⇒ 3<sup>rd</sup>/4<sup>th</sup> degree  
double the risk compared to ventouse
- ⇒ bleeding from lacerations
- ⇒ trauma to urethra & bladder ⇒ fistula
- ⇒ Pain 17% ventouse 11%

# COMPLICATIONS

- Fetal
  - ⇒ bruising & laceration to the face
  - ⇒ Injury to the fetal scalp
  - ⇒ cephalohematoma 9%    Vent 25%
  - ⇒ retinal hemorrhage 30%    Vent 50%
  - ⇒ skull fracture
  - ⇒ permanent nerve damage / Facial nerve

The risk of shoulder dystocia is increased following instrumental deliveries