Operative Vaginal Delivery: The Art of Obstetrics

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Objectives

- Define the classification of operative vaginal delivery performed.
- Understand the indications for performing operative vaginal delivery.
- Properly apply both forceps

No disclosures
Timing of Delivery

- I am a fetus in the womb
- I fear it may become my tomb
- If only I could give a shout
- To make my doctor get me out

- Unknown medical student, Dublin Ireland BJOG
Overview of Forceps

- 700+ varieties
- 3 categories
  - Classical
    - Parallel shanks: Simpson, DeLee, Irving, Hawks-Dennen
    - Overlapping shanks: Elliott, Tucker-McLane
  - Rotational (Kielland, Leff)
  - Special (Piper)
Types of Forceps

- **Simpson forceps** (1848) are the most commonly used among the types of forceps and has an elongated cephalic curve. These are used when there is substantial molding of the fetal head.

- **Elliot forceps** (1860) are similar to Simpson forceps but with an adjustable pin in the end of the handles which can be drawn out as a means of regulating the lateral pressure on the handles when the instrument is positioned for use. They are used most often when there is minimal moulding.
Types of Forceps

- **Kielland forceps** (1915, Norwegian) are distinguished by an extremely small pelvic curve and a sliding lock. The most common forceps used for rotation. The sliding lock is helpful in asyncliticit. Kielland forceps lack traction because they have almost no pelvic curve.

- **Wrigley's forceps** are used in low or outlet delivery and in cesarean section delivery where manual traction is proving difficult. The short length results in a lower chance of uterine rupture.

- **Piper's forceps** have a perineal curve to allow application to the after-coming head in breech delivery.
Anatomy of the Forceps: Elliott and Simpson Forceps
Anatomy of the Forceps
Forceps Locks
Sir James Y. Simpson 1845
Luikart-Simpson

- Luikart R. A modification of the Kielland, Simpson, and Tucker-McLane forceps to simplify their use and improve function and safety. Am J Obstet Gynecol 1937;34:686
- pseudofenestrated blade
Elliot

- Overlapping shanks
- Short, rounder cephalic curve
- Set screw between handles (reduce cephalic compression)
- For unmolded heads
Anatomy of the Forceps: Elliot Forceps with Adjustable Pin
Tucker-McLane 1880’s
Arthur H. Bill Axis Traction Handle 1920’s
Christian Kielland 1915
- Long shanks of the forceps are curved backwards like a reverse pelvic curve
- This design drops the handles below the blades
- The unique construction of the shanks provide more spring to the blades and results in less head compression
Operative Vaginal Delivery

- Applying direct traction to the fetal skull (forceps) or the fetal scalp (vacuum) along with maternal expulsive efforts to effect a vaginal delivery
- Incidence estimated at 8-15%
- Fetal head must be engaged
- Membranes ruptured
- Cervix completely dilated
- Bladder empty of urine
Operative Vaginal Delivery

- Indications for operative vaginal delivery
  - Prolonged second stage of labor (nulliparous 3 hours with regional anesthesia or 2 hours without) multiparous (2 hours with regional anesthesia and 1 hour without regional anesthesia)
  - Fetal compromise
  - Shorten of the second stage of labor for maternal indications
Prerequisites for Forceps Delivery

- The head should be engaged and the station of the head accurately known.
- The cervix should be completely dilated.
- The exact position of the head should be known. Occasionally ultrasound may help if the degree of molding creates confusion.
- The type of pelvis should be known. Certain pelvic types will not allow for rotation. For example, a fetus in a posterior position in an android or anthropoid pelvis is best delivered in the occipitoposterior (OP) position.
Prerequisites for Forceps Delivery

- The operator should be familiar with the advantages and disadvantages of the different forceps.

- There should be adequate anesthesia for the forceps delivery contemplated. A low or outlet forceps delivery can be performed under pudendal block; a forceps rotation of greater than 45° or a midforceps procedure requires a good epidural

- The bladder should be empty.

- This is an operative procedure, and it should be accorded the same respect and care for aseptic technique as any other operative procedure.
Contraindications for Operative Vaginal Delivery

- Unengaged fetal head
- Inability to determine fetal position
- Malpresentation (face or brow)
- CPD actual or suspected
- Prematurity (< 34 weeks vacuum)
- Repeated scalp pH (vacuum)
- Inability to apply instrument correctly
- Incompletely dilated cervix
Position of the fetal head
Position of the Fetal Head

- Left occiput anterior
- Right occiput anterior
- Occiput anterior
- Left occiput transverse
- Right occiput transverse
- Occiput posterior
Outlet Forceps

- Scalp is visible at the introitus without separating the labia
- Fetal skull has reached the pelvic floor
- Sagittal suture in A-P diameter, or Right or Left anterior or posterior position
- Fetal head is at or near the perineum
- Rotation does not exceed 45 degrees

ACOG
Outlet Forceps

Lift out deliveries and at CS

- The fetal scalp is visible without separating the labia
- The fetal skull has reached the pelvic floor
- The sagittal suture is in the antero–posterior diameter or right or left occiput anterior or posterior position (rotation does not exceed 45 degrees)
- The fetal head is at, or on, the perineum

RCOG
Low Forceps

- Leading point of skull at or > +2 and not on pelvic floor
- Rotation is 45 degrees or less (R or L ant to OA or R or L posterior to OP)
- Rotation is > 45%

ACOG
Midforceps

- Stations is above +2 but the head is engaged
- High forceps are no longer included in the classification

ACOG
Rotational Forceps

Kielland's forceps
Forceps Delivery OA, LOA, ROA
Checks for proper placement

- Sagittal suture lies in the midline of the shanks
- No more than one finger can be placed between the fetal head and the blades or fenestrations on either side
- Posterior fontanelle is not more than one finger’s breadth above the plane of the shanks (in OA position)
Pajot-Saxtorph Maneuver
Rotation with Forceps
Maternal and Neonatal Outcomes of Successful Kielland’s Rotational Forceps Delivery

Sarah J. Stock, PhD, Katherine Josephs, BSc, Sarah Farquharson, BSc, Corinne Love, MD, Sarah E. Cooper, MD, Chris Kissack, MScB, Ranjit Akolekar, PhD, Jane E. Norman, MD, and Fiona C. Denison, MD
Rotational Forceps
Classical Application
Classical Application
Classical Application
Classical Application
Direct Application
Wandering Application
Piper Forceps

- Application to the after-coming head in a breech delivery
- Overall morbidity decreased by 50% with use of forceps
- Controls the flexion attitude of the head, avoids hyperextension, no traction on the cervical spine or trunk
- Avoid delayed descent and possible hypoxia
Piper Forceps: Technique

- Application: shoulder and arms delivered with head in pelvis
- Infants body is held horizontal by an assistant (towel sling)
- Operator assumes low sitting or kneeling position
Piper Forceps: Technique

- Insertion from below and upward the handle is swept in a downward arc toward the midline. L blade inserted into L side of pelvis over infant's R ear (Direct Application).
- Application of the blade guided by 2 fingers of the R hand.
Piper Technique

- The fetus is then swung towards the maternal L thigh and the R blade is inserted from below and upward, the R handle being swept in a downward arc toward the midline with the R blade inserted into R side of pelvis over infants L ear (Direct Application)
- Application of the blade guided by 2 fingers of the R hand
- If resistance is met, the toe of the blade is introduced more posteriorly and wandered into place
Piper Forceps: Technique

- After the shanks are locked the infant is straddling the forceps
- The handles rest in the upturned palm with middle finger in the space between the shanks
- The neck is splinted by the fingers of the operators L hand
Piper Forceps: Technique

- The fetus is then delivered over the perineum by flexion without removal of the forceps (Note how the application of the forceps keeps the head flexed and prevents deflexion/extension of the fetal head)
- Mauriceau Maneuver: index and middle finger are applied over the maxillae to flex the fetal head while the body is elevated towards the abdomen
Mauriceau Maneuver

- Index and middle finger are applied over the maxilla to flex the fetal head while the body is elevated towards to abdomen.
Occiput Posterior