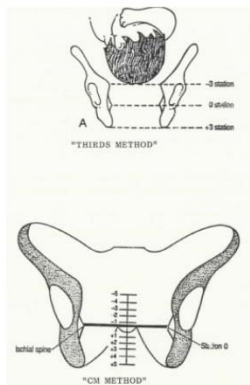


Forceps and Vacuum Delivery (Operative Vaginal Delivery)

Luann Beacom RN, FNP, MPH, MSN

Stations

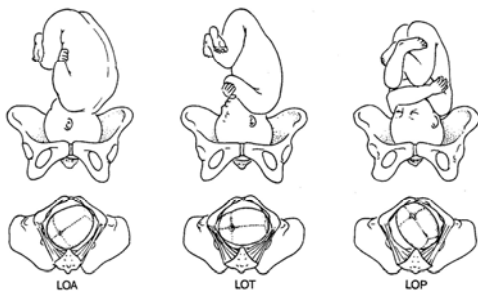
- Centimeter Method
 - 0 station is at the ischial spines
 - -1 to -5 centimeters above the spines
 - +1 to +5 centimeters below the spines
- Thirds Method
 - 0 station is at the ischial spines
 - Pelvis divided into thirds above and below the spines
 - -1 to -3 above the ischial spines
 - +1 to +3 below the ischial spines



Positions of Vertex Presentations

- Left Occiput:
 - Anterior (LOA)
 - Transverse (LOT)
 - Posterior (LOP)
- Right Occiput:
 - Anterior (ROA)
 - Transverse (ROT)
 - Posterior (ROP)
- Direct OA, OP

Fetal presentations. (Redrawn from Benson, RC: Handbook of Obstetrics and Gynecology, 7th ed. Los Altos, California, Lange Medical Publications, 1980)



Vertex Presentations

Cardinal Movements

- Engagement
- Descent, Flexion
- Internal Rotation
- Extension
- Restitution (External Rotation)



Indications for Operative Vaginal Delivery

“When it is technically feasible and can be safely accomplished, termination of second-stage labor by forceps or vacuum extraction delivery is indicated in any condition threatening the mother or fetus that is likely to be relieved by delivery.”

- Williams Obstetrics 2010

Maternal Indications

- Heart Disease
- Pulmonary Injury or Compromise
- Neuromuscular Disease
- Intrapartum Infections
- Exhaustion
- Prolonged second-stage labor

etc.

Fetal Indications

- Prolapsed Cord
 - Abruption
 - Category III and some Category II FHR Patterns
 - Vaginal Breech Delivery
- etc.

Prolonged Second Stage

- ACOG, Guidelines for Perinatal Care, 2013
 - Nulliparous
 - More than 3 hours with regional anesthesia
 - More than 2 hours without regional anesthesia
 - Parous
 - More than 2 hours with regional anesthesia
 - More than 1 hour without regional anesthesia
- ACOG/SMFM, 2014, reaffirmed 2016
 - Recommends allowing one additional hour in the setting of an epidural
 - Nulliparous 4 hrs; Parous 3 hrs

Prolonged Second Stage Causes

- Malposition/presentation, Deflexion, Asynclitism
 - Macrosomia
 - Excessive Analgesia/Anesthesia
 - Nulliparity
 - High Station at Complete Cx Dilation
- etc.

Non-operative Management

- Position Changes
- Assure empty bladder
- Allowing the Effects of Analgesia/Anesthesia to Subside
- Assist with pushing efforts
- Oxytocin Stimulation
- Watchful Waiting

Contraindications

(Relative)

- Prematurity (Vacuum)
 - < approx. 34 weeks gestation
- Non-vertex presentations (Vacuum)
- Suspected Fetal Coagulation Defect
- Unengaged Fetal Head or Unknown Position
- Fetal Bone Demineralization Condition
 - e.g., osteogenesis imperfecta

Trial Operative Vaginal Delivery/Failed Attempt

- Forceps or vacuum are attempted, knowing that a certain degree of CPD may exist.
- Failed attempt is used to describe abandonment of a planned trial with subsequent C/S.
- Trials are an appropriate option when the Provider thinks there is a high likelihood of success.

Combined Methods

- Use of vacuum and forceps generally not recommended.
- Failure of one instrument often indicates CPD.
- ACOG 2015:
 - “The weight of available evidence appears to be against routine use of sequential instruments at operative vaginal delivery.”

Prerequisites & Preparation

- Engaged Head
- Vertex
 - Exceptions: Forceps can also be used for face presentation and for delivery of head with breech presentation (Pipers)
- Position of Head Determined
- Completely Dilated Cervix
- ROM
- Fetal Weight & Pelvic Adequacy Estimated
- Adequate Anesthesia
- Bladder emptied
- > 34 weeks (approx.) for Vacuum

Forceps Function

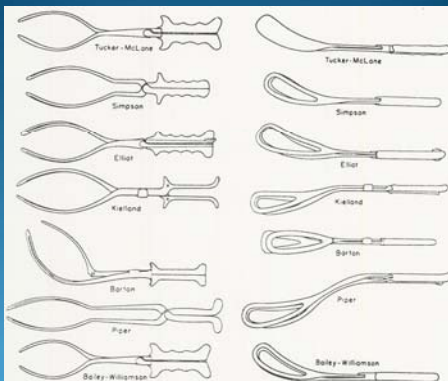
- Traction
 - To assist with descent of head.
- Rotation
 - To assist with internal rotation of the head.

Classification of Forceps Delivery

- Outlet Forceps
- Low Forceps
 - Rotation less than or equal to 45 degrees.
 - Rotation greater than 45 degrees.
- Midforceps

Design of Forceps

- Components
 - Blade
 - oval to elliptical
 - fenestrated vs. solid
 - Shank
 - Lock
 - Handle
- Curves: Cephalic, Pelvic



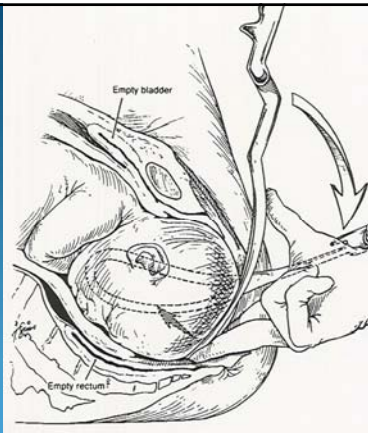
Operative Obstetrics by Douglas & Stromme 1957

Types of Forceps

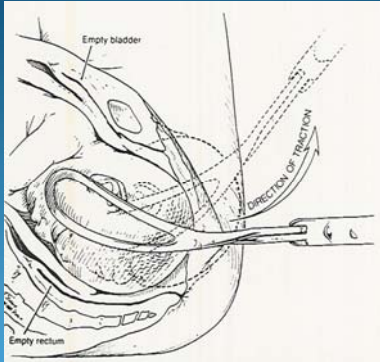
- Elliot
- Simpson
- Tucker-McLane
- Kielland
- Barton
- Piper
 - used for delivery of head in vaginal breech deliveries etc.

Application and Delivery Forceps

- Inserted one blade at a time.
- Applied over cheek and ear.
- Horizontal Traction
- Upward traction as head emerges.



Williams Obstetrics
23rd Ed.
2010



Williams
Obstetrics
20th Ed.
1997

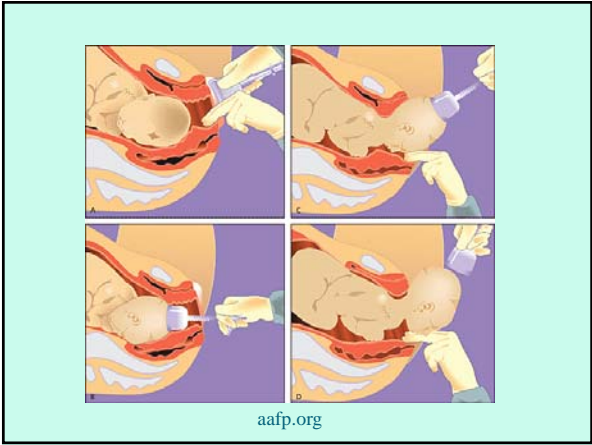
Function and Design of Vacuum Extractor

- Function
 - Traction only
 - Can assist with "autorotation"
- Design
 - Cup
 - Handle
 - Tubing (if using remote suction)
 - Filter
 - Suction Mechanism

Application & Delivery Vacuum

- Evenly Over the Sagittal Suture
 - Prevent asynclitism
- Close to Posterior Fontanelle
 - Prevent deflexion
- Assure no maternal tissue is caught between the cup and the head
- May or may not release vacuum pressure between contractions
- May or may not apply traction only with contractions





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Time & Pop-off Limits With Vacuum

- Descent should be expected with traction and if there is no descent with the first several pulls, a reappraisal is necessary (ACOG 2015).
- Total peak pressure not to exceed 5-10 minutes.
- If the cup becomes detached approximately 3 times, consider abandoning the attempt.

Comparison of Forceps & Vacuum

- Function
 - Forceps can be used for rotation.
 - Vacuum difficult with anything other than anterior positions.
- Success
 - Forceps less likely to fail.
- Application
 - Forceps require application within vagina and knowledge of precise positioning – more difficult
 - Vacuum easier to learn

Comparison of Complications Forceps

- Associated with 3rd & 4th degree perineal tears
- Fetal trauma
 - Long term sequelae is rare
 - Facial depressions or abrasions/lacerations
 - Facial nerve palsy (rare)
 - Corneal abrasions & external ocular trauma
 - Cephalohematoma (no different that with vacuum)
 - If with improper use/placement
 - Skull fracture
 - Intracranial hemorrhage (same as with vacuum, and c-sections)

Comparison of Complications Vacuum

- Perineal lacerations/maternal hematoma occur, but less commonly that with vacuum
- Fetal trauma
 - Long term sequelae is rare
 - Scalp edema (transient)
 - Scalp lacerations
 - Cephalohematoma
 - Hyperbilirubinemia/Jaundice
 - Retinal hemorrhage
 - Intracranial hemorrhage (same as with forceps & c-section)
 - Shoulder dystocia

Nursing Considerations Anticipation

- Effective 2nd Stage Labor Management
 - Labor down?
 - Effective pushing
 - Keep bladder empty
- Consider Maternal Health Problems and/or Chorio
- Anticipate with Fetal Compromise if Vaginal Delivery Imminent

Preparation

- Obtain forceps or vacuum
- Provide lubrication
- Assist with anesthesia

Coaching/Counseling

- Answer questions
- Coach with pushing efforts

Assistance with Vacuum

- Hook up suction if electronic suction used
- Nursing controlled hand-held pumps
 - Prior to application, check suction by pumping to approx 40-60 cmHg
 - Once applied to head, pump to 10 cmHg to maintain cup on head
 - With contractions, 40-60 cmHg to assist with traction
 - Between contractions, decrease pressure to 10 cmHg

Aftercare of Mother, Infant

- Assess and record common side effects
 - e.g., forcep marks, scalp edema
- Assess for signs of trauma
- Notify physician

Documentation

- Forceps or physician controlled vacuum – responsibility of physician
- If nurse assisting with vacuum – unclear
- Follow hospital standard
- Consider documenting (not all agree):
 - Type of vacuum
 - Time started
 - Peak pressure
 - Time on & off
 - Resting pressure
 - Attempts
