

OPERATIVE VAGINAL DELIVERY



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INTRODUCTION

An operative delivery refers to an obstetric procedure in which active measures are taken to accomplish delivery.

These procedures can be divided into operative vaginal delivery (**OVD**) and cesarean section.

We are concerned here with the operative vaginal delivery (OVD).

OVD

What & Why?

What: Direct traction on the fetal head with forceps or vacuum

Why: Indications for vacuum and forceps are the same (see next slide)

INDICATIONS OF OVD

FETAL

- Malposition with relative dystocia (e.g. occiput posterior or transverse).
- Suspected or anticipated fetal compromise.

MATERNAL

1-Shorten and reduce the effects of the second stage of labor on medical conditions;

- cardiac disease, NYHA III or IV
- hypertensive crises
- myasthenia gravis
- spinal cord injury patients at risk of autonomic dysreflexia
- proliferative retinopathy

2- Inadequate progression of labor;

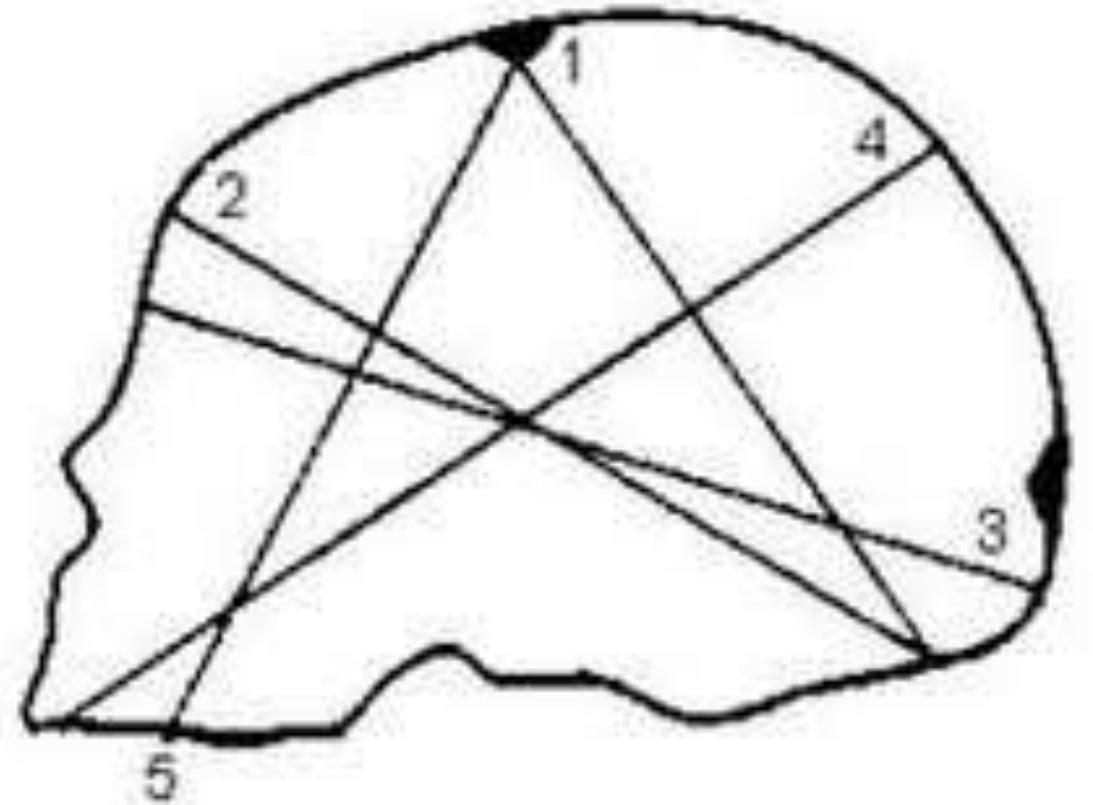
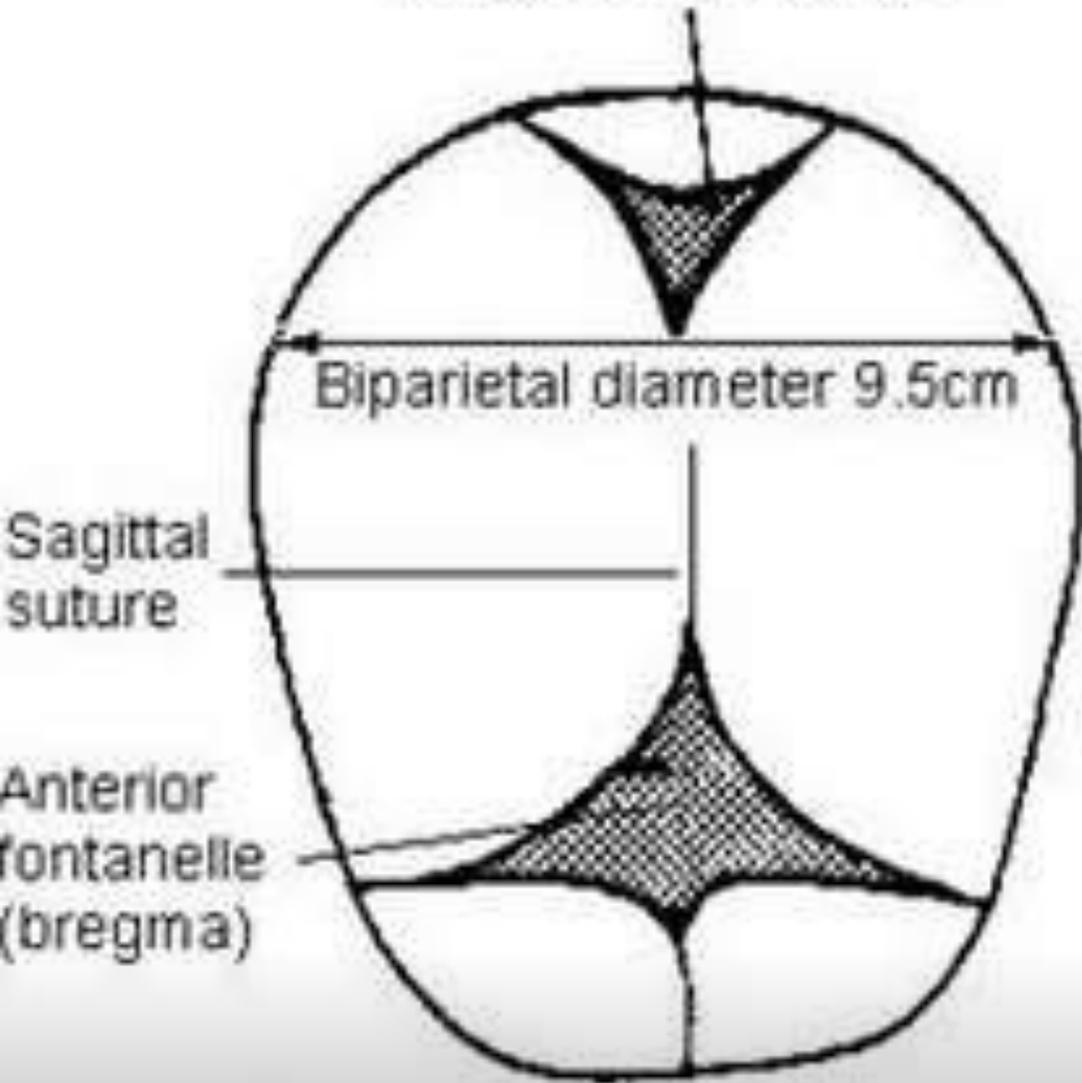
- Nulliparous women 2hrs without epidural analgesia (EA)/ 3hrs with EA)
- Multiparous women 1hr without EA /2hrs with EA.

3-Maternal fatigue/exhaustion

CONTRAINDICATIONS OVD

ABSOLUTE	RELATIVE
<ol style="list-style-type: none">1. Operator inexperience2. Incompletely dilated cervix3. Unknown fetal position4. Unengaged head5. Undeliverable malpresentation e.g. brow or face mento-posterior.6. Suspected CPD (assess with abdominal and pelvic assessment).7. <u>Ventouse delivery</u>: Gestation < 36+0 weeks (risk of intracranial hemorrhage and cephal-hematoma).	<ol style="list-style-type: none">1. Predisposition to fracture (e.g. osteogenesis imperfecta).2. Suspected bleeding disorder such as hemophilia or alloimmune thrombocytopenia.3. Vertically transmitted disease i.e. HIV.

Posterior fontanelle



- 1 Suboccipitobregmatic 9.5cm flexed vertex presentation
- 2 Suboccipitofrontal 10.5cm partially deflexed vertex
- 3 Occipitofrontal 11.5cm deflexed vertex
- 4 Mentoverical 13cm brow
- 5 Submentobregmatic 9.5cm face

The fetal head diameters

Pre-requisites for OVD

- According to RCOG green top guidelines number 26, january 2011

- Devided into 3 sections ; full abdominal & vaginal examination, preparation of the mother , and preparation of the staff.

1- FULL ABDOMINAL & VAGINAL EXAMINATION

- 1- Head is $\leq 1/5$ th palpable per abdomen
- 2- Vertex presentation.
- 3- Cervix is fully dilated and the membranes ruptured.
- 4- Exact position of the head can be determined so proper placement of the instrument can be achieved.
- 5- Assessment of caput and moulding.
- 6- Pelvis is deemed adequate. Irreducible molding may indicate CPD.

Pre-requisites for OVD

2- PREPARATION OF THE MOTHER

- 1-Clear explanation should be given and informed consent obtained.**
- 2-Appropriate analgesia is in place for mid-cavity rotational deliveries. This will usually be a regional block.**
- 3-A pudendal block may be appropriate, particularly in the context of urgent delivery.**
- 4-Maternal bladder has been emptied recently. In-dwelling catheter should be removed or balloon deflated.**
- 5- Aseptic technique.**

Pre-requisites for OVD

3- PREPARATION OF THE STAFF

- 1- Operator must have the knowledge, experience and skill necessary.**
- 2- Adequate facilities are available (appropriate equipment, bed, lighting).**
- 3- Back-up plan in place in case of failure to deliver.**
- 4- 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).**
- 5- A senior obstetrician competent in performing mid-cavity deliveries should be present if a junior trainee is performing the delivery.**
- 6- Anticipation of complications that may arise (e.g. shoulder dystocia, postpartum hemorrhage)**
- 7- Personnel present that are trained in neonatal resuscitation.**

Classification of OVD

-According to the ACOG classification 2000.

-Classified into ; **outlet** , low, mid, and high OVD operations.

1- OUTLET

- 1- **Fetal scalp visible without separating the labia**
- 2- **Fetal skull has reached the pelvic floor**
- 3- **Sagittal suture is in the antero-posterior diameter or right or left occiput anterior or posterior position (rotation does not exceed 45°)**
- 4- **Fetal head is at or on the perineum**

Classification of OVD

-According to the ACOG classification 2000.

-Classified into ; outlet , **low**, mid, and high OVD operations.

2- LOW

1- **Leading point of the skull (not caput) is at station +2 cm or more and not on the pelvic floor**

2-**Two subdivisions:**

A) . rotation of 45° or less from the occipito-anterior position.

B). rotation of more than 45° including the occipito-posterior position.

Classification of OVD

-According to the ACOG classification 2000.

-Classified into ; outlet , low, **mid**, and high OVD operations.

3- MID

1-Fetal head is no more than 1/5th palpable per abdomen

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

3- Two subdivisions:

A). rotation of 45° or less from the occipito-anterior position

B). rotation of more than 45° including the occipito-posterior position

Classification of OVD

-According to the ACOG classification 2000.

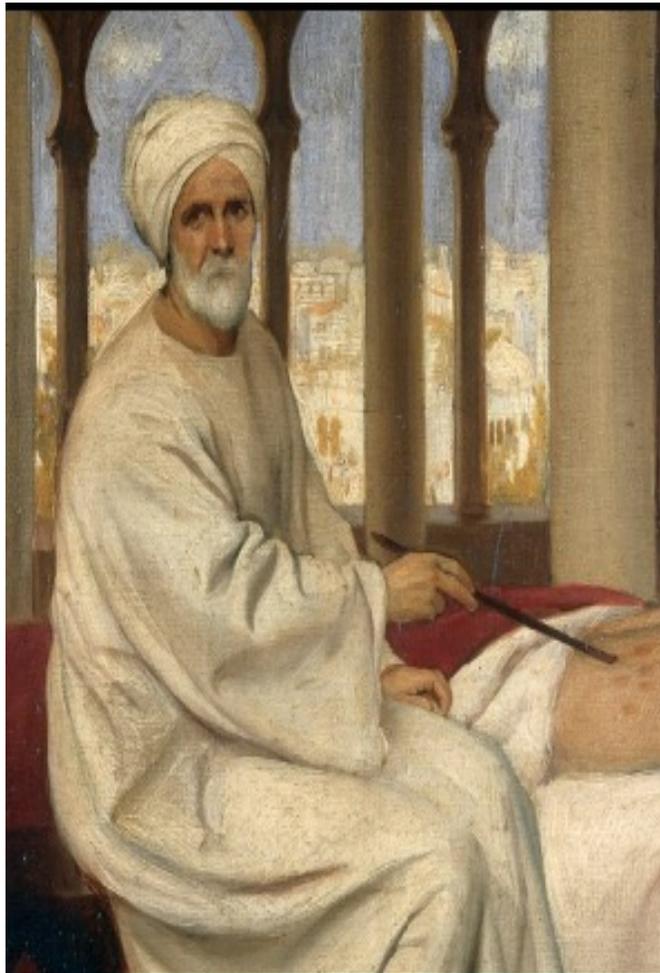
-Classified into ; outlet , low, mid, and **high** OVD operations.

4- HIGH

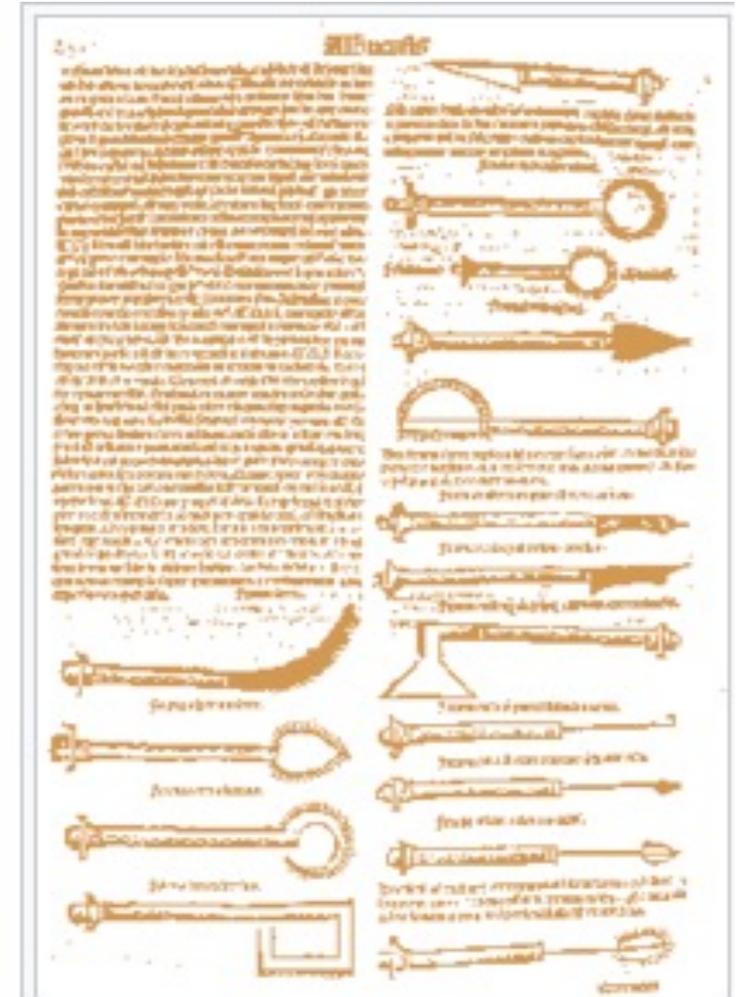
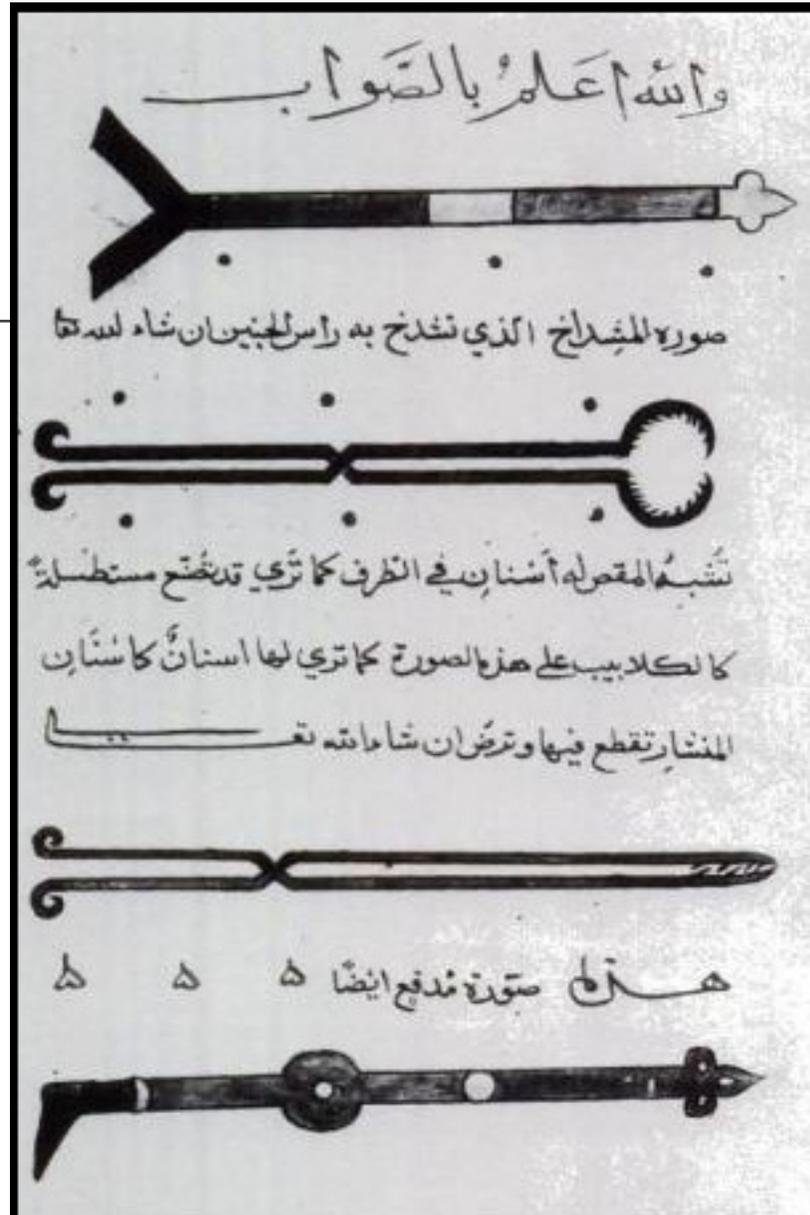
Not included in the classification as operative vaginal delivery is not recommended in this situation where the head is 2/5th or more palpable abdominally and the presenting part is above the level of the ischial spines

OBSTETRIC FORCEPS

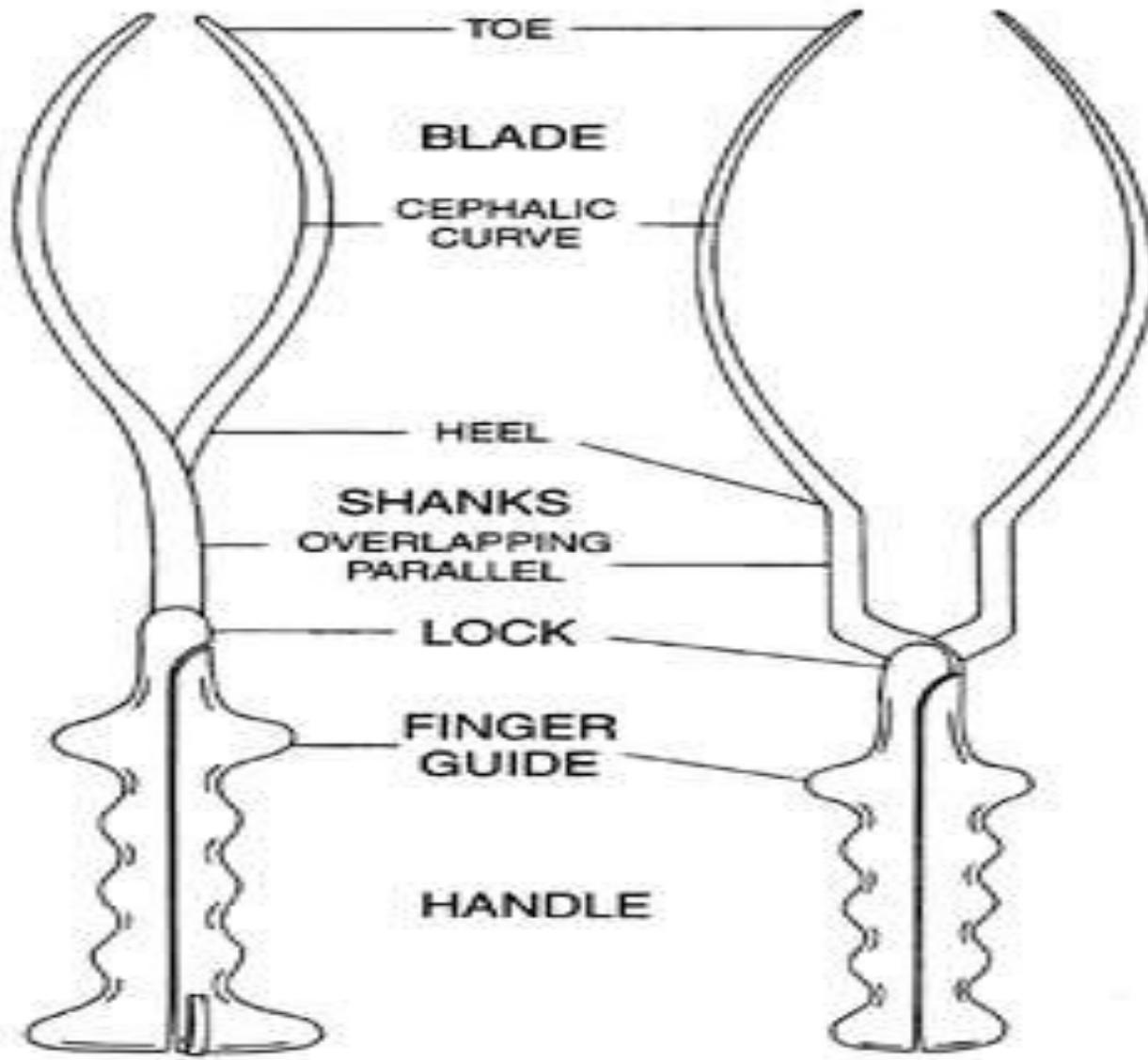
- **This is an instrument designed to aid in the delivery of the fetus by applying traction on the head.**
- **The credit for the invention of the precursor of the modern forceps to be used on live infants goes to **Abū al-Qāsim Khalaf ibn al-‘Abbās al-Zahrāwī al-Ansari (936-1013 AC)**. In most of the European literature they attributed the credit to **Peter Chamberlen of England (circa 1600)**.**
- **Modifications have led to more than 700 different types and shapes of forceps.**



Albucasis (Al-Zahwari) blistering a patient in the hospital at Cordova, 1100 AD.



Page from a 1531 Latin translation by Peter Argellata of Al-Zahrawi's treatise on surgical and medical instruments.



Basic design of obstetric forceps

Note that ;

The blades are oval or elliptical and can be fenestrated or solid.

Commonly used forceps

1- Simpson forceps

- **The most commonly used types of forceps in outlet delivery.**
- **Has elongated cephalic curve.**
- **These are used when there is Substantial molding of the fetal head.**



2. Elliot forceps

- **Has adjustable pin for regulating the lateral pressure on the handles.**
- **They are used most often when there is minimal molding.**
- **More suitable for outlet delivery.**



Commonly used forceps

3-Kielland forceps

- Has small pelvic curve and a sliding lock.
- Suitable for head with little molding.
- The most common forceps used for **rotational** delivery (OP).
- Helps correct asynclitism.



4- Piper's forceps

- Distinct perineal curve.
- Allows for application to the **after-coming head** in breech delivery.



Commonly used forceps

5- Tucker-McLane Forceps

- Suitable for fetal head with little molding.
- Used in **rotational** delivery.



6- Braton Forceps & Traction Handle

- Rotational delivery.
- Most importantly used for delivery of OT positions in a platypelloid pelvis.



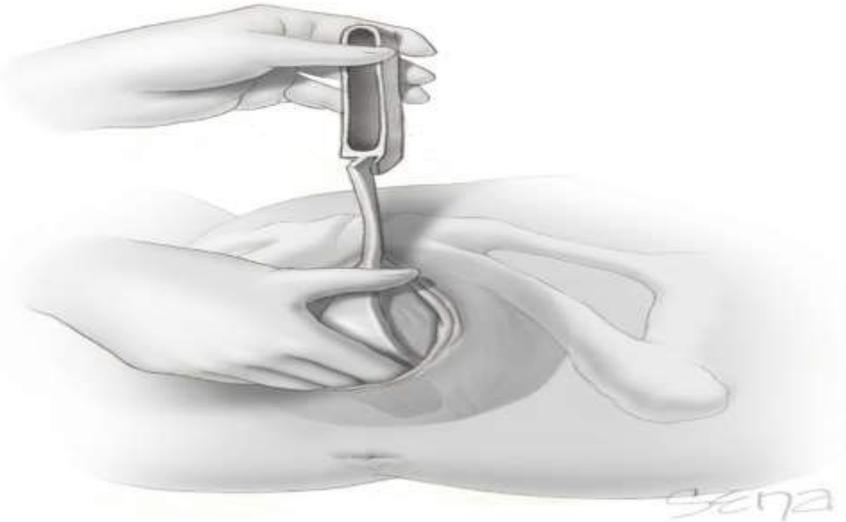
FORCEPS OPERATIVE DELIVERY

1- FORCEPS APPLICATION

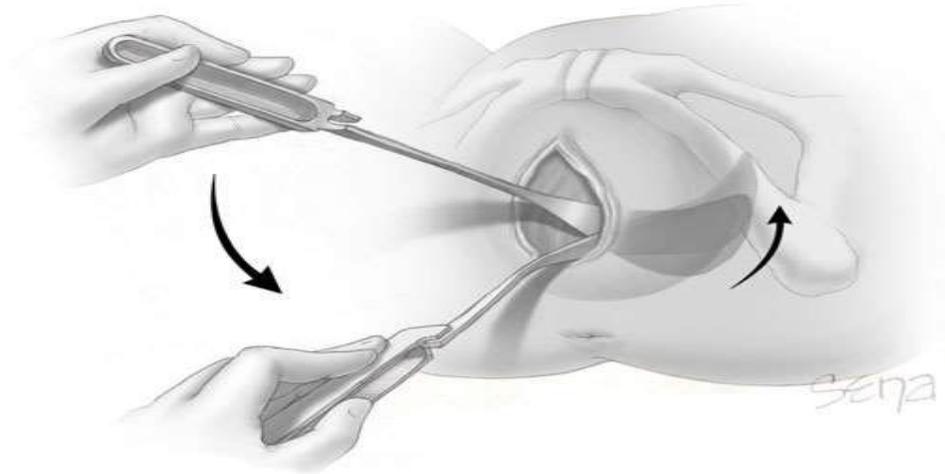
2- GENTLE FORCEPS TRACTION

3- DELIVERY OF THE HEAD

1- APPLICATION OF FORCEPS



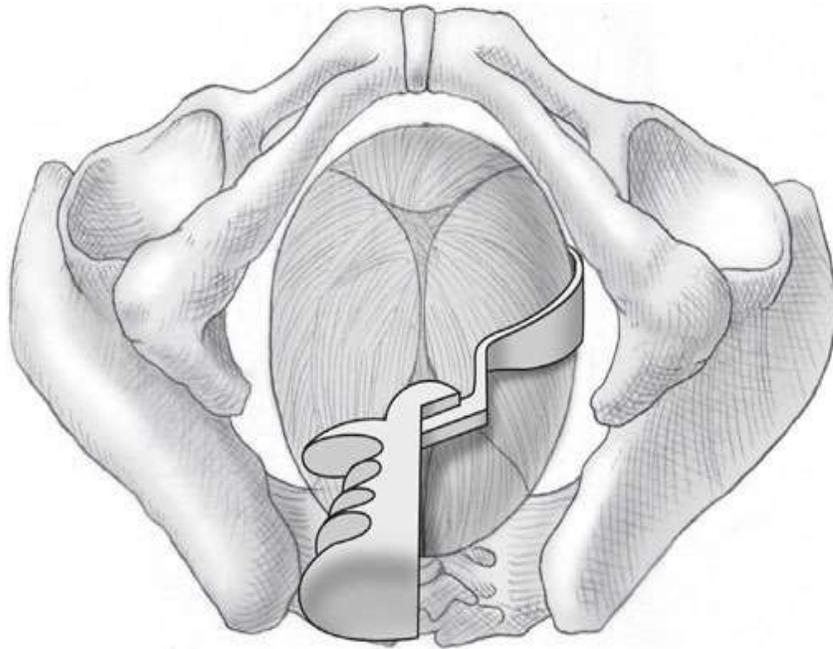
1-The left handle of the forceps is held in the left hand. The blade is introduced into the left side of the pelvis between the fetal head and fingers of the operator's right hand.



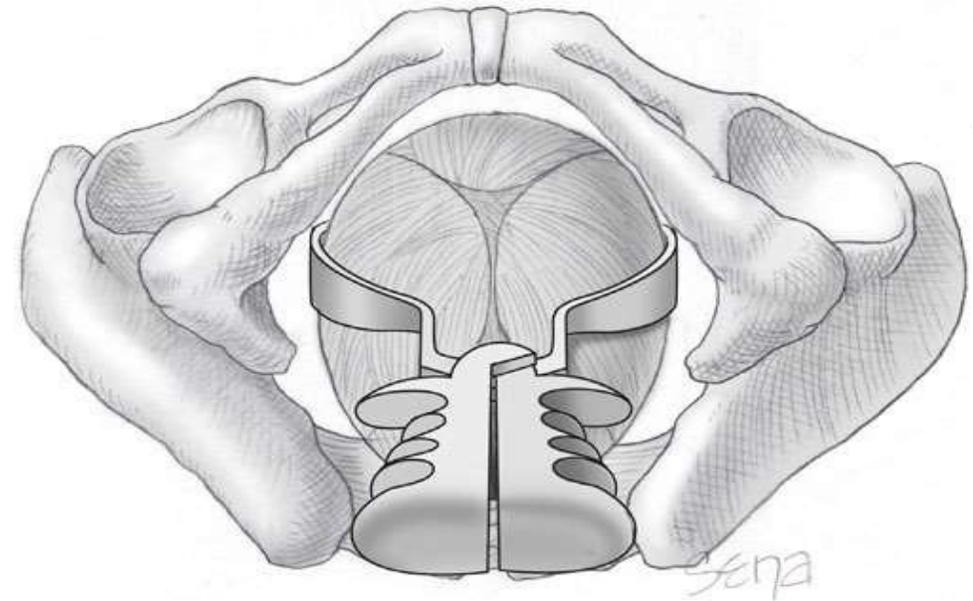
2- Continued insertion of the left blade. Note the arc of the handles as they rotate to be applied to the mother's left.



1- APPLICATION OF FORCEPS

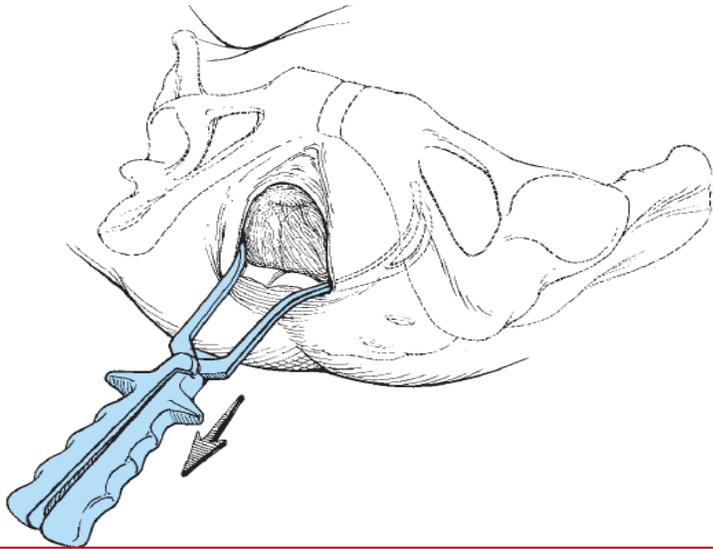


3- First blade (LEFT) in situ.

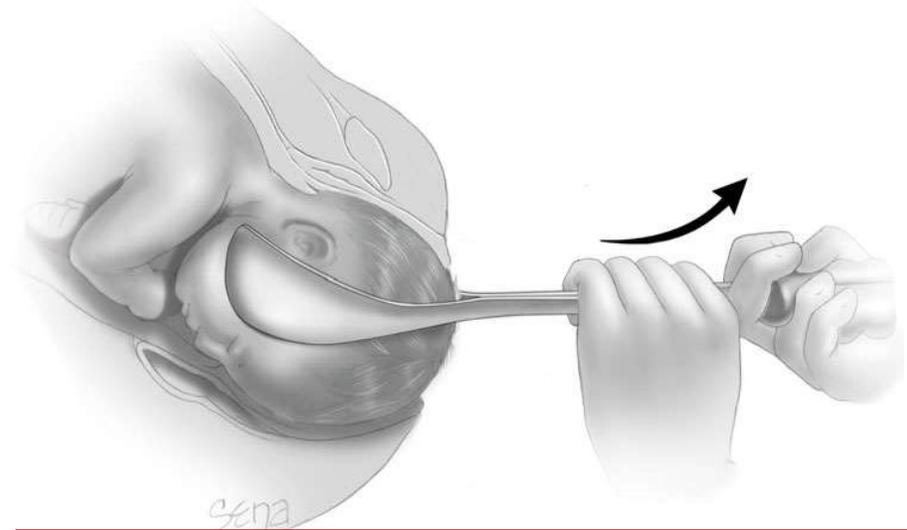


4- Blades symmetrically placed and articulated along occipitomentental diameter.

2- FORCEPS GENTLE TRACTION

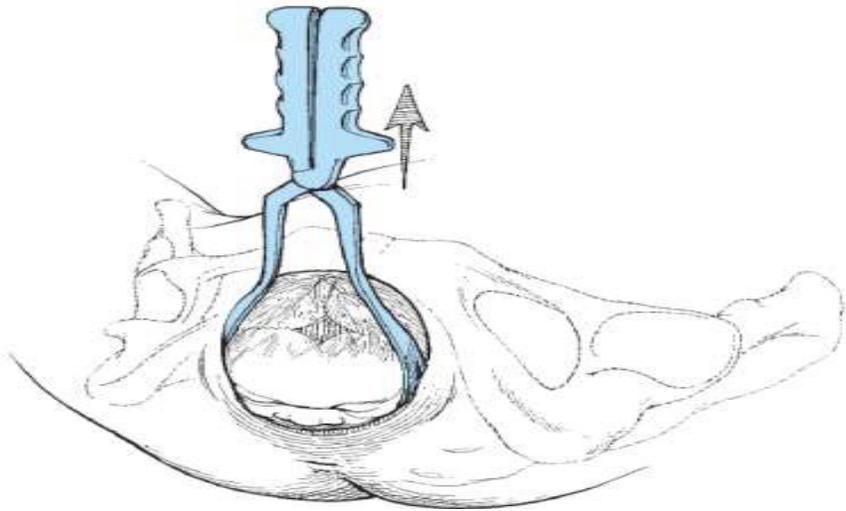


1-With intermittent traction, as the vulva is distended by the occiput, an episiotomy may be performed if indicated.

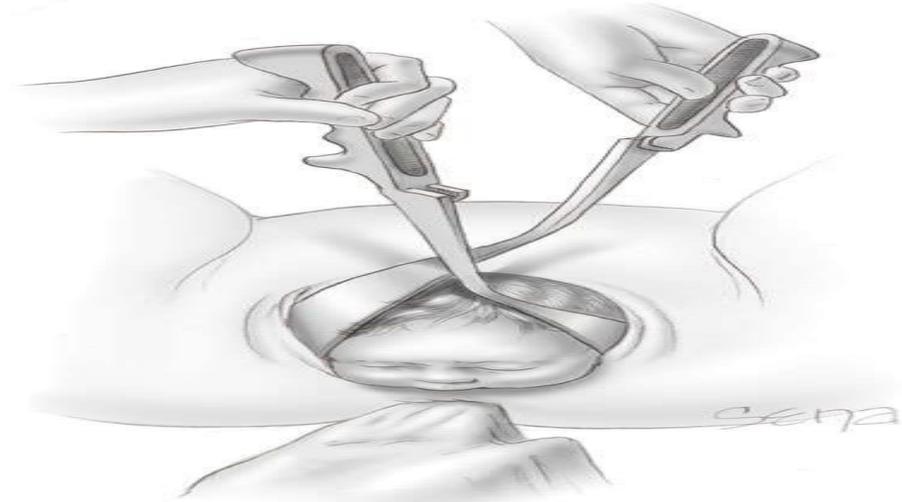


2-Additional horizontal traction is applied, and the handles are gradually elevated, as the handles are raised, the head is extended.

3- DELIVERY OF THE HEAD



3- Upward traction is continued as the head is delivered.



4- Forceps may be disarticulated as the head is delivered. Modified Ritgen maneuver may be used to complete delivery of the head.

INSERTING THE LEFT BLADE OF THE FORCEPS



1

embarazada.com



TRACTION -DELIVERY OF THE HEAD -DISARTICULATION OF FORCEPS

2

VACUUM ASSISTED VAGINAL DELIVERY (VAVD)- THE APPARATUS

Synthetic Cups (soft or rigid)

- Hand held disposable rigid Mityvac (down below), Kiwi Omnicup or conventional soft cup ventouse (silastic).
- Higher failure rate than metal cups.
- Less neonatal scalp injuries than metal cups.
- Suitable for straightforward deliveries (no significant caput).



Metal Cups

- Preferred for delivery of;
 - Occipito-posterior
 - Occipito-transverse.
 - Difficult occipito-anterior positions .



VACUUM ASSISTED VAGINAL DELIVERY (VAVD)- THE TECHNIQUE

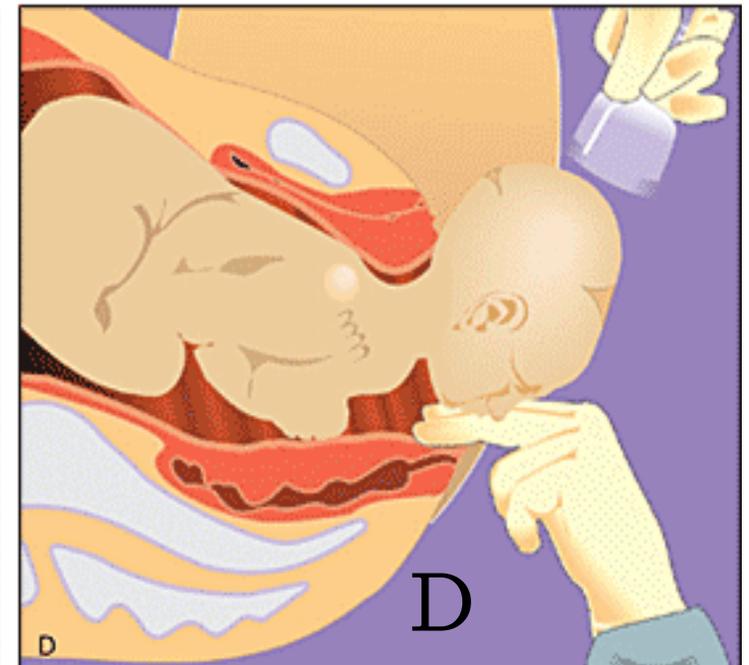
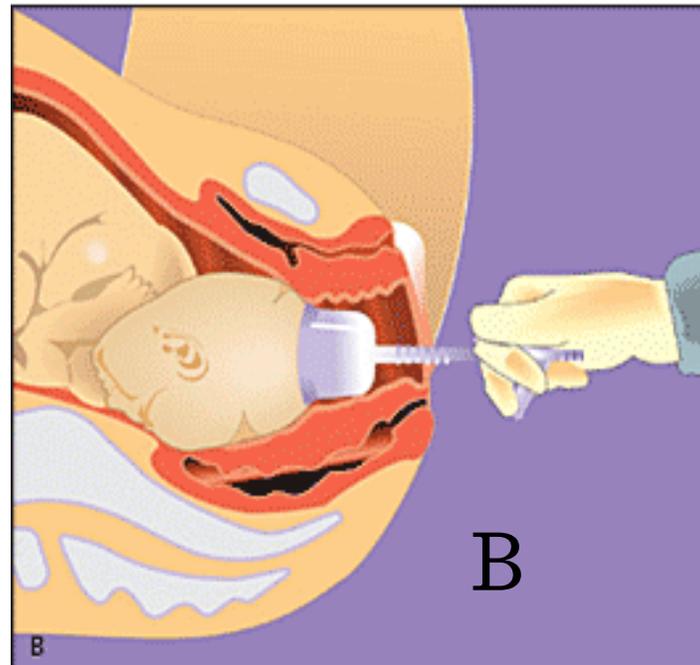
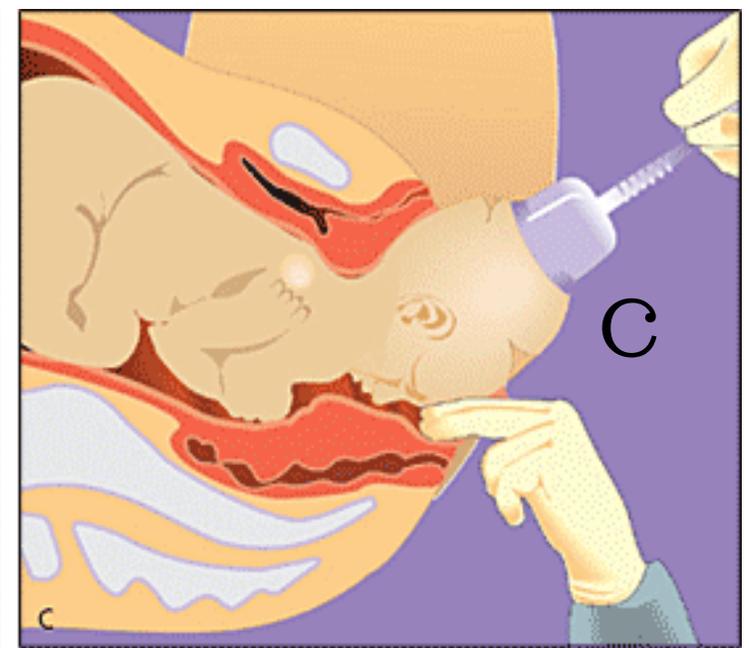
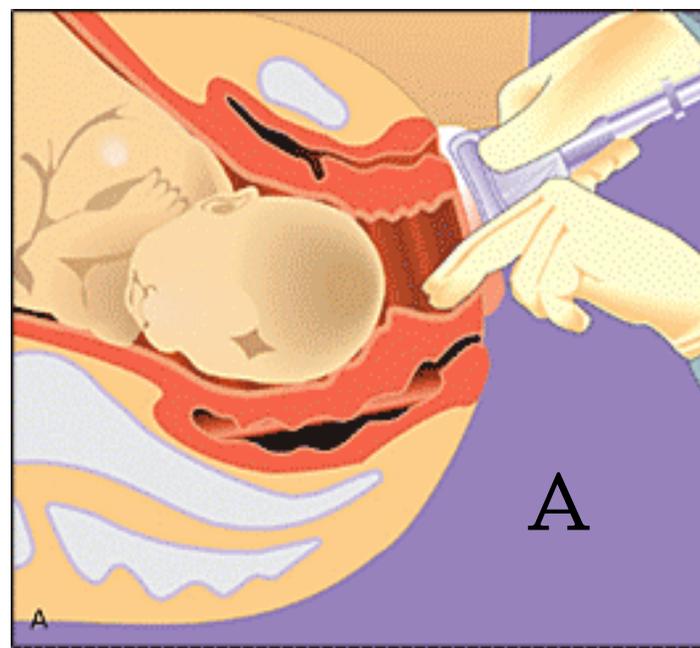
- 1. Position woman in dorsal lithotomy.**
- 2. Insert cup, check no maternal tissue is trapped beneath the cup.**
- 3. The center of the cup should be over the sagittal suture and about 3 cm in front of the posterior fontanel toward the face.**
- 4. Increase scalp suction pressure to around 440 mm Hg (=60 kPa)
= (0.612Kg/cm²).**
- 5. In coordination with contractions and maternal expulsive effort, apply gentle traction in line with the pelvic axis.**

VACUUM ASSISTED VAGINAL DELIVERY (VAVD)- THE TECHNIQUE

- 6- Maintain pressure and moderate traction between contractions.**
- 7- Adequate descent should be verified during each pull.**
- 8- If the cup dislodges, exclude fetal scalp or maternal injury before reapplying**
- 9- Obtain arterial and venous cord blood gases immediately after delivery.**
- 10 Assess and repair any maternal trauma.**

After determining position of the head,

- (A) insert the cup into the vagina , ensuring that no maternal tissues are trapped by the cup.
- (B) Apply the cup to the flexion point 3 cm in front of the posterior fontanel, centering the sagittal suture.
- (C) Pull during a **contraction** with a steady motion, keeping the device at right angles to the plane of the cup. In occipitoposterior deliveries, maintain the right angle if the fetal head rotates.
- (D) Remove the cup when the fetal jaw is reachable



VACUUM ASSISTED VAGINAL DELIVERY (VAVD)- THE TECHNIQUE

- **Do not** apply rocking motion or torque, only steady traction in the line of the birth canal.
- **Stop after:**
 - 3 “pop-offs” (slipping) of vacuum,
 - > 20 minutes elapsed ,
 - 3 pulls with no progress
 - Evidence of fetal scalp injury



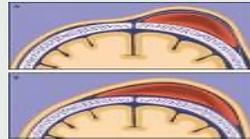
VACUUM ASSISTED VAGINAL DELIVERY (VAVD)- THE TECHNIQUE

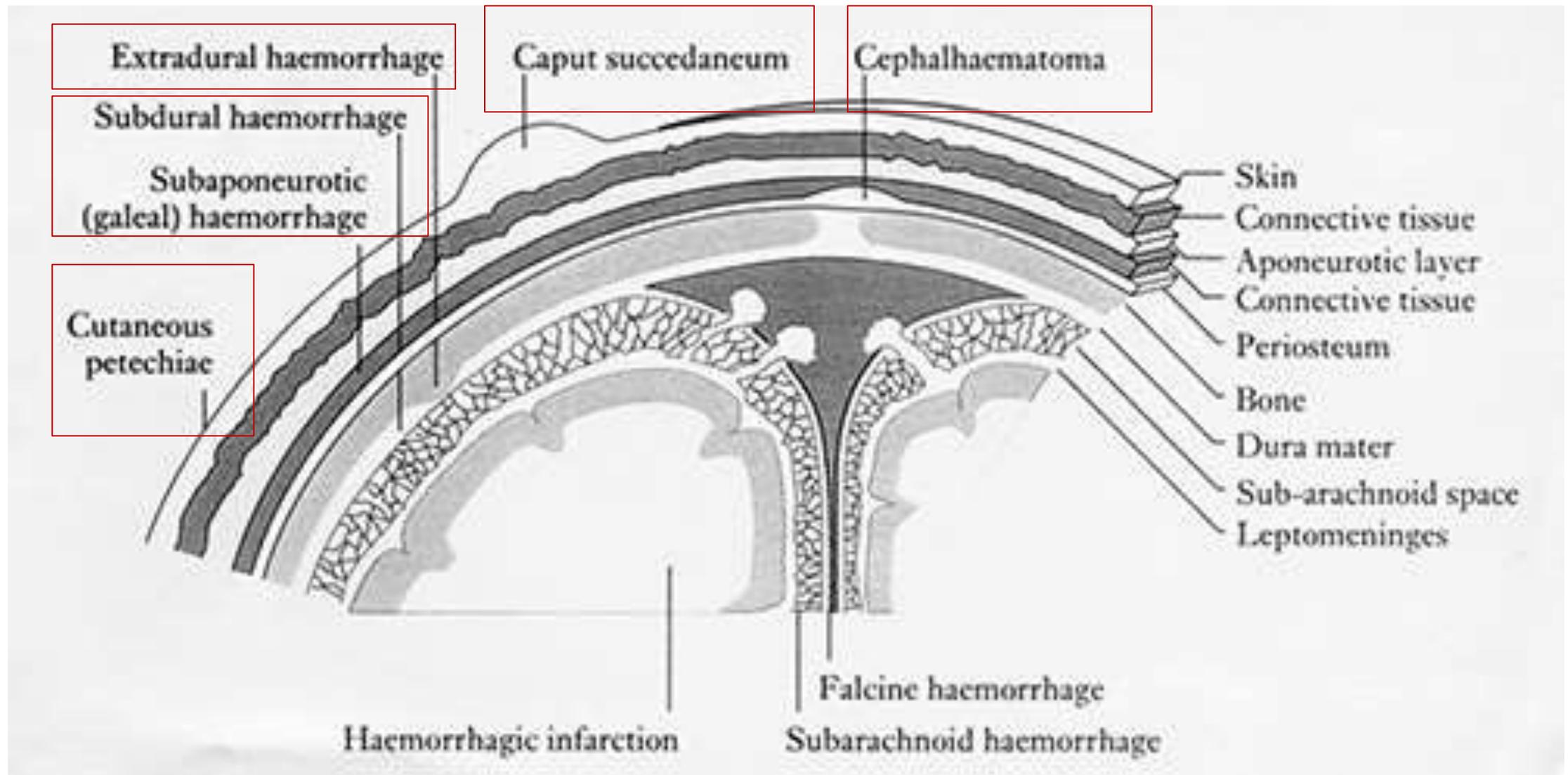
Consider abandoning the procedure if:

- 1- The cup dislodges 2 times despite good technical application and delivery is not imminent
- 2- Delivery is not imminent after 15 minutes (evaluate whether to continue with OVD or consider recourse to C-section).
- 3- Sequential use of vacuum and forceps to achieve delivery may result in increased maternal and neonatal morbidity.

SERIOUS COMPLICATIONS OF OVD

	COMPLICATION	INSTRUMENT
MATERNAL	1- 3rd and 4th degree perineal tears	> FORCEPS
	2- Extensive or significant vaginal / vulval tear	> FORCEPS
	3- Postpartum hemorrhage	> FORCEPS
FETAL	1- Intra-cranial hemorrhage 2- Subaponeurotic (subgaleal hemorrhage)	> VACUUM > VACUUM
	3- Injury of sixth and seventh cranial nerves, Erb palsy	MIXED
	4- Cervical spine injury (fetal)	> FORCEPS (ROTATIONAL)





FREQUENTLY OCCURRING COMPLICATIONS OF OVD

	COMPLICATIONS	INSTRUMENT
MATERNAL	1- 1st and 2nd degree perineal tear.	> FORCEPS
	2- Anal sphincter dysfunction & voiding dysfunction.	> FORCEPS (OP POSITION)
FETAL	1- Forceps marks on face	FORCEPS
	2- Cup marking on the scalp (Chignon)	VACUUM
	3- Cephalhematoma	> VACUUM
	4- Neonatal jaundice / hyperbilirubinaemia	> VACUUM
	5- Retinal hemorrhage	> VACUUM

FORCEPS *versus* VENTOUSE

FORCEPS	VENTOUSE
<ol style="list-style-type: none">1. Less likely to result in neonatal morbidity (cephalhaematoma, sub-galeal & retinal hemorrhage).2. More likely to result in maternal soft tissue injury.3. More likely to result in successful vaginal delivery and will occur over a shorter time.4. Subtle (more delicate) for assisted vaginal deliveries < 36+0 of gestation.	<ol style="list-style-type: none">1. There is an increased incidence of cephal-hematoma, sub-galeal & retinal hemorrhage in the newborn.2. Less likely than forceps to result in successful vaginal delivery.3. Less use of regional anesthesia.4. Less serious maternal injury.5. Less pain 24 hours after delivery.

PREDICTORS OF COMPLICATIONS

Higher rates of failure and serious or frequent complications are associated with:

- 1- Higher maternal body mass index (BMI > 30).
- 2- Ultrasound estimated fetal weight > 4,000 g or
- 3- clinically large baby.
- 4- OP position.
- 5- Mid-cavity delivery or when 1/5 fetal head palpable abdominally.

PREVENTIVE MEASURES OF OVD

RCOG recommends the following;

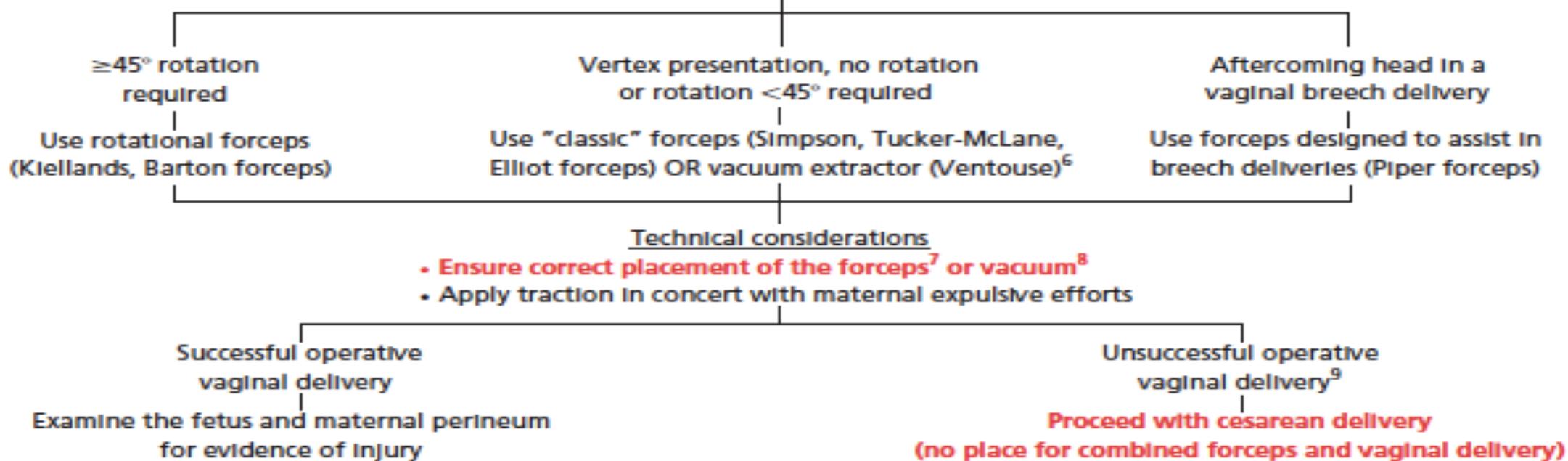
- 1. All women should be encouraged to have continuous support during labor as this can reduce the need for operative vaginal delivery.**
- 2. Use of upright or lateral positions during 2nd stage of labor.**
- 3. Avoiding epidural analgesia.**
- 4. Delayed pushing for 1 to 2hrs in primiparous women with an epidural until the urge to push becomes stronger.**

CONCLUSION

- **OVD should be undertaken by a skilled obstetrician with adequate knowledge of pelvic and fetal skull anatomy.**
- **The same indications and contraindications used for forceps deliveries should be applied to vacuum-assisted deliveries.**
- **Forceps are associated mostly with **maternal** morbidity where as vacuums have higher rates of **neonatal** morbidity.**
- **Early recognition and abandonment of failing procedure and paramount importance.**
- **When performed right, children born via OVD have nneurodevelopmental delay when compared to those born via spontaneous vaginal delivery.**

- **Confirm an indication for operative vaginal delivery²**
- **Exclude contraindications to operative vaginal delivery³**
- Be aware of the type of operative vaginal delivery you will be performing⁴
- **Review the risks, benefits, and alternatives to operative vaginal delivery**
- Discuss potential complications to the mother and fetus⁵

Ensure that all prerequisites for operative vaginal delivery have been fulfilled			
Maternal criteria	Fetal criteria	Uteroplacental criteria	Other criteria
<ul style="list-style-type: none"> • Adequate analgesia • Lithotomy position • Bladder empty • Clinical pelvimetry must be adequate in dimension and size to facilitate an atraumatic delivery • Verbal or written consent 	<ul style="list-style-type: none"> • Vertex presentation • Fetal head must be engaged in pelvis • Position of fetal head must be known • Station of fetal head must be $\geq +2$ • Attitude of fetal head and presence of caput succedaneum and/or molding should be noted 	<ul style="list-style-type: none"> • Cervix fully dilated • Membranes ruptured • No placenta previa 	<ul style="list-style-type: none"> • Experienced operator who is fully acquainted with the use of the instrument • The capability to perform an emergency cesarean delivery if required



THANK
YOU