

Operative Deliveries & C-section

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Objectives:

1. Identify the incidence of operative delivery.
2. Mention the indications for operative deliveries including the pre-requisites to be fulfilled before applying forceps or ventouse.
3. Identify the rate of caesarean deliveries, their mortality and fetal and maternal morbidity.
4. Discuss the types of cesarean deliveries and their complications.
5. Indicate when a trial of normal labor may be offered after caesarean section delivery.
6. Describe the measures to reduce Caesarean section rates.
7. Describe common measures for the prevention of infections, deep vein thrombosis and other complications of operative delivery.
8. List the key components of postoperative care.

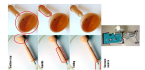
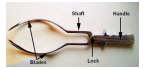
Operative Vaginal Deliveries

Definition When we have obstructed or too long labor we have to use vaginal instrument or take the patient to the OR and perform a cesarean section.

- It is the delivery of the fetus using an **instrument** through the vaginal route. (a non-natural “non-spontaneous vaginal” form of delivery).
- Incidence of operative vaginal deliveries is 3.5 %.
- Instrumental delivery has to be done in the operating room, because you may need an emergency C-section if you fail, that’s why we call it operative vaginal delivery.

Instruments used in operative vaginal delivery

1. **Forceps:** provide traction and rotation of the fetal head
 - Sometimes we use the forceps to get the baby out of a cesarean incision.
2. **Vacuum (ventouse extractor):** a suction cup that is applied to the fetal head and allow it to follow the normal extension > internal rotation as it comes underneath the pubic bone.
 - The **vacuum extractor is contraindicated in preterm delivery bc the head and scalp are more prone to injury**



Indications of operative delivery (including the instrumental and CS)

Maternal	Fetal
<ul style="list-style-type: none"> • Prolonged or arrested 2nd stage labor (full dilatation of the cervix (10cm dilated) until the baby is out (delivery), when the mother start pushing, so you can’t decide to use an instrument in the 1st stage of labor) (the biggest indication). <p>for maternal benefit (pushing can be hazardous to the patient), especially in:</p> <ul style="list-style-type: none"> • Maternal cardiac disease or pulmonary disease you don’t want a patient with a cardiac disease to perform a Valsalva maneuver this has a detrimental effect on her and she is unable to perform that effectively to deliver the baby, so we tend to shorten 2nd stage • Poor maternal effort (exhaustion) the mother is not able to push the baby out on her own. • Patients with retinal detachment or post op for similar ocular conditions. It is detrimental to perform the Valsalva maneuver(taking a deep breath) and pushing as well. 	<ul style="list-style-type: none"> • Prolonged 2nd stage due to posterior occiput fetal presentation “ it’s harder to push out.” • Fetal distress demonstrated on the fetal heart tracing that we monitor during the course of labour , whether its repetitive deceleration or a sudden bradycardia or loss of variability • Prematurity (use Forceps only to protect the baby’s skull cuz the skull of a preterm baby can’t tolerate the application of the vacuum(negative suction) may lead to intracranial hemorrhage or subdural hematoma due to the weak skull of the premature baby, and this also prevent sudden decompression of the fetal head which prevent hemorrhage. • Certain malpositions you should know the difference between presentation and malposition. Here it means the diameters that should come in the pelvis are not the right diameters for the easy passage of the fetal head through the maternal pelvis. This can be sometimes corrected with an instrument(but you should know the position of the head exactly and which position you want to correct the head into. So you are actually bringing the right diameter through the maternal pelvis and that's how you accomplish successful vaginal delivery. e.g. occipitoposterior. To make the head of the baby perfectly suitable you get out of the vagina.

Prerequisite for forceps and ventouse you have to know before applying an instrument on the fetal head what to look for to make sure this is gonna be **safe** primarily and this is going to **succeed** secondarily.

Must be checked ¹	Conditions to be fulfilled things that ideally should be present. But if you don't have them cuz of time you can apply the instrument.
<ul style="list-style-type: none"> ● Cervix has to be fully dilated (10cm which defines the beginning of the 2nd stage) If you did it with the cervix not fully dilated, you may end up pulling the cervix with you!!! you can tear the cervix that and that may cause severe maternal hemorrhage, and of course if the cervix is not fully dilated, you won't be able to deliver the baby. ● Membranes ruptured whether they have ruptured spontaneously (most likely the situation) or you have ruptured them by yourself to expedite the course of labor. If the cervix is fully dilated but the membranes are not ruptured yet you have to rupture it yourself to access the fetal head. ● Head has to be engaged (0 station) the biparietal diameter has to be below the mother's ischial spine. Because here where you can make sure that the delay in delivery is not that because mother's pelvis is too small for the baby's head (cephalopelvic disproportion → the head is not low enough → if you apply the instrument that could be very traumatic) and the head can pass through it. ● Head position known: Forceps can also be used to stabilize the coming head in breech presentation. ● Vertex (cephalic) presentation. <ul style="list-style-type: none"> ○ Ventouse can only be applied on the head². 	<ul style="list-style-type: none"> ● Adequate analgesia. But sometimes you don't have time. ● Experienced operator. ● Empty bladder (to prevent damage to that structure and to provide more room to facilitate delivery). ● Adequate episiotomy. to make things easier (adequate space) and prevent multiple perinatal and vaginal lacerations and tears.

¹ Mandatory clinical assessment to determine the level of the presenting part, an estimate of the fetal size, and the adequacy of the maternal pelvis.

² The vacuum extractor is suitable for all vertex presentations, but unlike forceps, it must never be used for delivery of fetuses presenting by the face or breech. **But we can apply a specific type of forcep on the head and not on the feet or buttocks (application on an after coming head).**

Complications of Instrumental Delivery

Maternal	Fetal
<ul style="list-style-type: none"> • Genital tract lacerations (Cervix, vagina) “due to entrapment using ventouse”. which leads to: • Hemorrhage. • Extensions of episiotomy in difficult deliveries and big babies. which leads to: • Sphincter lacerations. 3rd or 4th (into the rectum) degree of injury³ which will lead to Fecal and flatus incontinence. (more with the forceps) and if it happens you have to repair it at the same time bc you might end up with: • Injury to the rectal mucosa. serious condition that needs to be addressed immediately 	<ul style="list-style-type: none"> • Skull fractures if you apply the blades inappropriately, and you're not locking them well. • Cephalohematoma > ↑ICP because the forceps is too tight on the baby's head. • Caput succedaneum⁴ Caused only by the vacuum due to suction of the fetal head. • Facial Palsy. Due to compression on the facial nerves (sometimes it recovers sometimes it doesn't depending on the severity). • Scalp laceration Neonatal jaundice arises from scalp bleeding. whether it's due to the wrong application of the forceps(the blade in a wrong place) or by excessive negative suction of the metal cup of the ventouse) • Intracranial hemorrhage & subgaleal hematoma. • Infant death.

TRIAL OF INSTRUMENTAL DELIVERY

- Should be performed in O.R. with an anesthetist present + pediatrician to resuscitate. Unless if there is acute bradycardia and the head is almost out then you may do it Labour room
- All teams ready to proceed to C.S. in case failed instrumental delivery nursing staff, anesthetist, pediatrician.

C-section if you primarily plan for it or if the instrumental delivery failed.

- Rate » 25%. if you exceed this number the indications have to be reviewed.
- Maternal mortality: 5 – 6 / 100,000 C/S.
- Perinatal mortality: 3/1000 in USA & 7/1000 in the U.K.

Classification

1. **Elective C/S:** previously Planned and timed
2. **Emergency C/S:** Unplanned during labor or before the onset of labor. The delivery was meant to be vaginally but something went wrong.

Indications of primary CS:

1. Cephalopelvic disproportion (CPD). it means the pelvis is too small for the fetal head.
2. Fetal malpresentation.
3. Category III EFM strip. The FHR monitor pattern suggests the fetus may not be tolerating labor, but commonly this is a false-positive finding.

³ Third degree: a laceration involving the anal sphincter

⁴ Edema above the skull.

Different Methods of Performing Different Types Of C/S there is no relationship between what you see in the skin and what's happening inside the uterus.

SKIN INCISION	UTERINE INCISION
<ul style="list-style-type: none"> Low transverse most commonly Midline. 	<ul style="list-style-type: none"> Upper Segment (Classical): made in the contractile fundus of the uterus and is less commonly performed⁵. <u>used only if we can't approach the lower segment e.g. previous C/S, multiple adhesions in the L segment, adhesion of the bladder, the way the baby is lying in the uterus you can't deliver the baby from the lower segment</u> <ul style="list-style-type: none"> transverse. vertical. disadvantages: the risk of bleeding and adhesions because the upper segment is near to the bowels and rupture rate is higher in the next pregnancy. Lower segment (best and ideally used): through the noncontractile portion of the uterus. <ul style="list-style-type: none"> Transverse⁶ incision of choice. Why? Less bleeding, less risk vertical

So put in mind that if you see a scar on the mother's bikini it doesn't mean the uterus was opened the same. The most common combination is low transverse skin incision and low transverse lower segment uterine incision.

Caesarean Section complications

COMPLICATIONS OF UPPER SEGMENT	COMPLICATIONS OF LOWER SEGMENT <i>less likely</i>	COMMON POST OP COMPLICATION
<ul style="list-style-type: none"> Bleeding ↑↑. bc ↑ thicker & more muscle Organ injury: <ul style="list-style-type: none"> Bowel. Bladder. Ureter. Adhesions formation. Rupture scar in future pregnancy higher than lower segment scar. More difficult to repair. 2-3 layers. 	<ul style="list-style-type: none"> Haemorrhage Organ injury: <ul style="list-style-type: none"> Bladder Bowel. Ureter. Adhesions, especially bladder. More Ruptured scar less likely than Upper S. Abnormal placentation in future pregnancy, placenta tends to like to implant onto the C-section scars Low lying placenta, previa or Accreta, increta, and percreta > roll that out in future pregnancies by US. Extension of incision: <ul style="list-style-type: none"> Lateral to the uterine artery causing bleeding & Downwards deep into vagina → difficult to repair. 	<ul style="list-style-type: none"> Atelectasia. Infections: <ul style="list-style-type: none"> Endometritis. Wound. UTI. Pneumonia. DVT & PE. And there is a protocol to prevent it.

⁵ Although it easier bc there is no need for bladder dissection, it is not common due to the Risk of uterine rupture both before labor as well as in subsequent labor which is so significant (5%)

⁶ the uterine incision is made transversely in the lower uterine segment after a bladder flap (separation of the bladder from the lower uterine segment by sharply incising the vesico-uterine peritoneum or serosa and using blunt and/or sharp dissection to develop this potential space which facilitates placement of a retractor) is established.

Measures to reduce C.S. RATE

1. Proper antenatal care for early detection and management of conditions that lead to ↑ C.S. rate e.g.:
 - Controlling macrosomia (large baby) in diabetes.
 - Early detection of HTN to prevent preeclampsia.
 - Post term if you keep the baby to the 41 and 42 weeks they will become big and hard to deliver vaginally.
2. Vaginal birth after Cesarean (VBAC) is a trial of labor that is offered after:
 - **Non recurrent** (can be prevented in next delivery) indications (of the 1st pregnancy) e.g. fetal distress, cord prolapse, placental abruption, and breech presentation. Recurrent = small pelvis. **this is imp**
 - **Pelvic adequacy** is confirmed by proper clinical and *radiological* methods as needed.
 - **Lower Segment scar.** If the pt has an **upper** segment scar you **can't** allow them to have the trial of **vaginal delivery** in the future pregnancies bc there is a high chance of the scar to rupture.
 - **Placental localization.** you have to make sure that the placenta is not on the scar
 - **Scar integrity** is assured by taking proper post operation history. if the pt had post-op fever and was diagnosed to have endometritis or fever related to any source of infection related to procedure → infected scars are usually weak and tend to rupture in the 2nd labour
 - Standard of care is to offer VBAC after **one previous C/S and not multiple.** The mother has no chance of having a normal delivery after having the 2nd C/S.
 - **Safe set up:** Tertiary care center which can perform **emergency C.S as needed** is a must.
 - **Patients' approval.**

POST Delivery CARE

1. Vital Signs hourly then x 4 hours.
2. I.V. fluids.
3. Analgesia.
4. Checking Fundus + Lochia⁷ (The blood that comes after delivery).
5. Urine output + catheter care.
6. Wound care.
7. **Prevent infections:**
 - Prophylactic Ab.
 - Aseptic technique.
 - Prevention of anemia.
8. To prevent DVT:
 - TEDS⁸ stocking
 - **Thromboprophylaxis.**
 - Early ambulation.
9. Breast care and breastfeeding.

⁷ **lochia** is the vaginal discharge after giving birth (puerperium) containing blood, mucus, and uterine tissue. **Lochia** discharge typically continues for 4 to 6 weeks after childbirth, which is known as the postpartum period. What's abnormal? [Picture](#)

⁸ Thromboembolism-deterrent (TED) stocking

MCQs

1- A 23 years old G1 at 38 weeks gestation presents in active labor at 6 cm dilated with ruptured membranes. On cervical Examination the fetal nose , eyes ,and lips can be palpated. The fetal heart rate tracing is 140 beats per minute with accelerations and no decelerations. The patient's pelvis is adequate. Which of the following is the most appropriate management for this patient?

- A- Perform immediate cesarean section without labor.
- B- Allow spontaneous labor with vaginal delivery.
- C-Perform forceps rotation in the second stage of labor to convert mentum posterior to mentum anterior and to allow vaginal delivery.
- D-Attempt manual conversion of the face to vertex in the second stage of labor.

2- A 25-years old G1P0 patient at 41 weeks present to labor and delivery complaining of gross rupture of membranes and painful uterine contractions every 2 to 3 minutes. On digital examination, her cervix is 3cm dilated and completely effaced with fetal feet palpable through the cervix. The estimated weight of the fetus is about 6 lb. and the fetal heart rate tracing is reactive. Which of the following is the best method to achieve delivery?

- A- Deliver the fetus vaginally by breech extraction.
- B- Deliver the baby vaginally after external cephalic version.
- C-Perform an emergent cesarean section .
- D-Perform some forceps -assisted vaginal delivery.

3- A 28-years old G1 at 38 weeks had a normal progression of her labor. She has an epidural and has been pushing for 2 hours. The fetal head is direct occiput anterior at +3 station. The fetal heart rate tracing is 150 beats per minute with variable decelerations. With the patient's last push the fetal heart rate had a prolonged deceleration to the 80 seconds for 3 minutes. You recommend forceps to assist the delivery owing to then on reassuring fetal heart rate tracing. Compared to the use of the vacuum extractor, forceps are associated with an increased risk of which of the following neonatal complications ?

- A- Cephalohematoma
- B- Retinal Hemorrhage
- C-Jaundice
- D-Corneal abrasions

4- A G9P8+0 lady at 42 weeks is having a prolonged second stage of labor. The presentation is vertex occiput posterior with head at 1 cm above ischial spine and cervix is 8cm dilated. What is an absolute contraindication for vacuum delivery in this case?

- A- Head station.
- B- Parity.
- C-Vertex occiput posterior presentation.
- D-Gestational age.

5- A 41-weeks pregnant lady G2P1 with previous cesarean section due to failure to progress. She has been in the second stage of labor for 55 minutes and the fetal head is at -2 station. The fetal heart is showing bradycardia for 10 minutes deceleration. What would be the best option for management?

- A- Augmentation with oxytocin.
- B- Emergency cesarean section.
- C-Forceps delivery.
- D-Vacuum extraction.

Answers: 1- B. 2- C. 3- D. 4- A. 5- B.