ABNORMAL LABOUR: INSTRUMENTAL DELIVERY AND CAESAREAN SECTION

SAVVAS ARGYRIDIS

CONSULTANT OBSTETRICIAN GYNAECOLOGIST

UNIVERSITY of NICOSIA | MEDICAL SCHOOL

Contents

Instrumental delivery: definition, epidemiology, types, comparison, indications

pre-requisites, classification, application

Caesarean section: definition, epidemiology, classification, indications,

preoperative evaluation, technique, postoperative care,

complications

Instrumental delivery: definition

-vaginal delivery assisted with the use of instruments such as forceps or vacuum

Instrumental delivery: epidemiology

Forceps

-1968: 29%, 1978: 12% (US): drop in rate over recent years

-reasons: difficult to learn, fear of litigation, rise of c/s

Vacuum

-stable number: 4%

-reasons: easy to learn

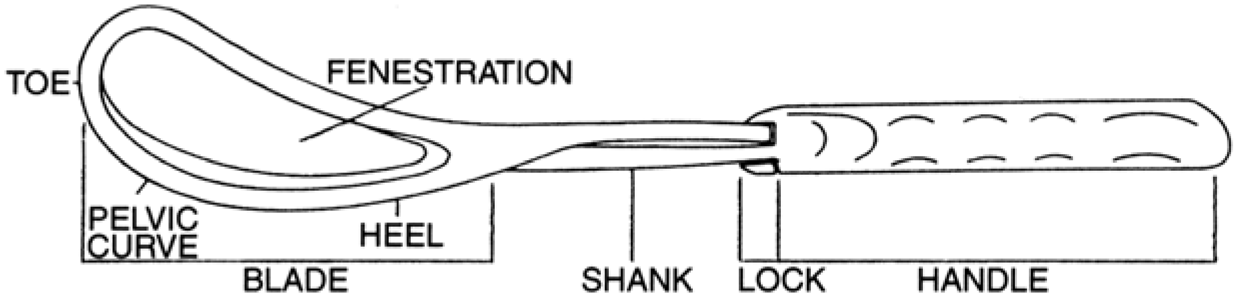
Instrumental delivery: types

Forceps

-handle

-shank: fulcrum point, lock

-blade: fenestrated or solid, pelvic curve, cephalic curve



Instrumental delivery: types

Vacuum

-traction bar

-chain or tube

-cup: metal or soft

Instrumental delivery: comparison

Vacuum advantages

-more physiological: head spontaneous rotation during traction

-patient assistance: pushing when traction applied

-traction applied: less-limit

-biparietal diameter: not increased

-perineal trauma: less

-skull injury: less

-easier to learn

Instrumental delivery: comparison

Vacuum disadvantages

-more cranial injury

-more cephalohematomas, galeal hemorrhages, retinal hemorrhages

-more failures

-no application in <34/40 gestation

Instrumental delivery: indications

Maternal

-inadequate maternal expulsive efforts: exhaustion, sedation

-prolonged second stage of labour

Fetal

-fetal distress

Instrumental delivery: pre-requisites

-cephalic presentation

-occipito-anterior or occipito-posterior position

-station: engaged

-gestational age: >34 weeks (for ventouse)

-cephalopelvic disproportion: absent

-cervix: full dilatation

-membranes: ruptured

-urinary bladder: empty

-anesthesia: adequate

Instrumental delivery: classification

According to fetal head position

i. Outlet:

-skull at pelvic floor, perineum, visible

ii. Low:

-skull: at +2

iii. Mid:

-skull: between 0 to +1

iv. High:

-skull: unengaged

Instrumental delivery: application

Forceps application

-landmarks: posterior fontanelle, sagittal suture

-left blade: hold with right hand and guidance with left hand, placed 1st

-right blade: hold with left hand and guidance with right hand, placed 2nd

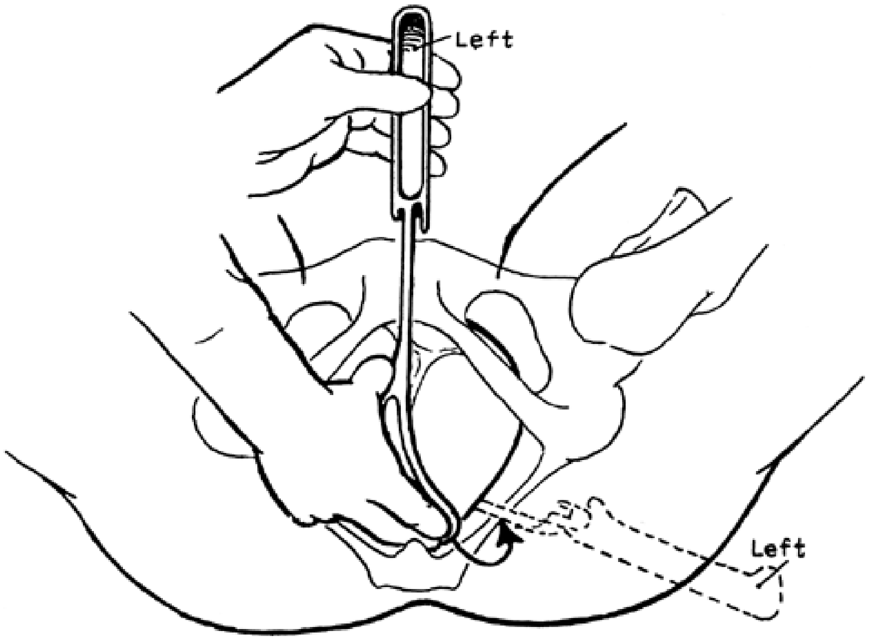
-accuracy of placement: posterior fontanelle: above level of blades

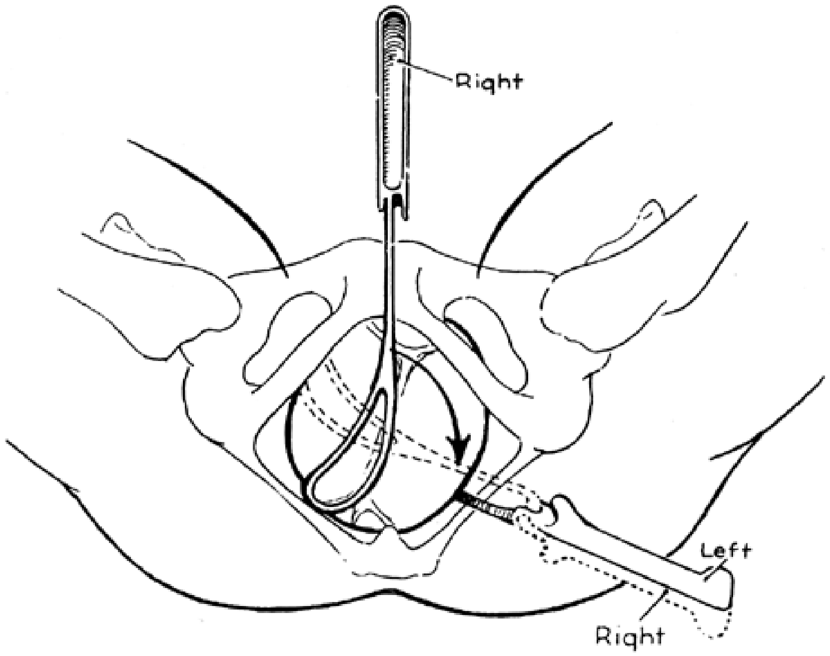
sagittal suture in middle

fenestration: 1 finger fits

Instrumental delivery: application

Forceps application



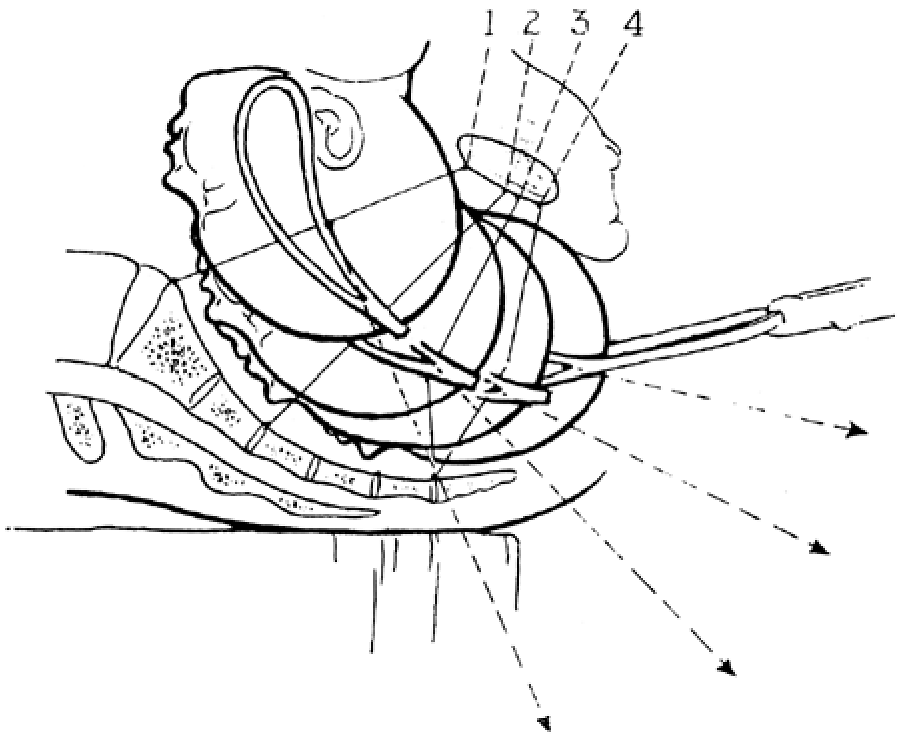


Instrumental delivery: application

Forceps application

-left hand: shanks: downward pull

-right hand: handles: parallel pull



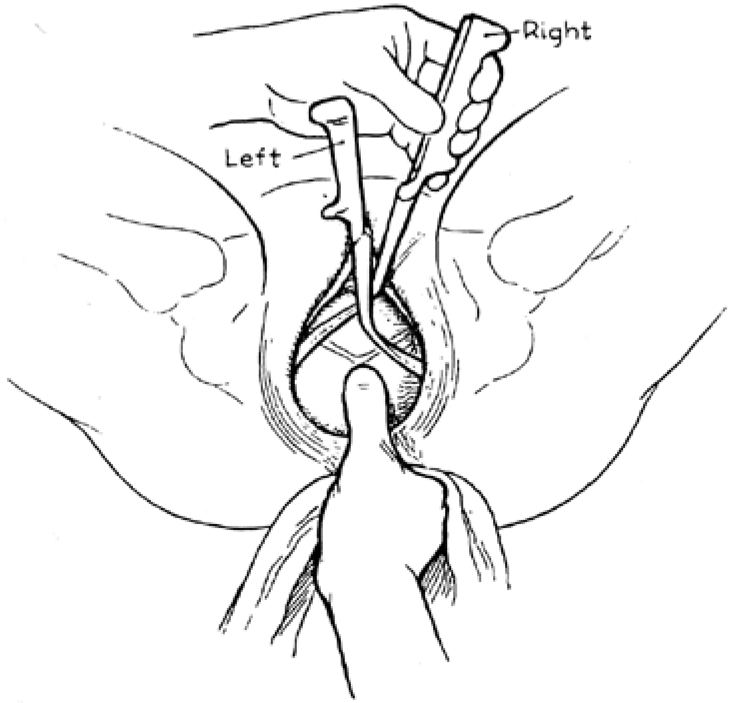
Instrumental delivery: application

Forceps application

-episiotomy

-head delivery

-removal in the opposite order of placement



Instrumental delivery: application

Vacuum application

-landmarks: posterior fontanelle, sagittal suture

-cup: placed on sagittal suture in front of posterior fontanelle

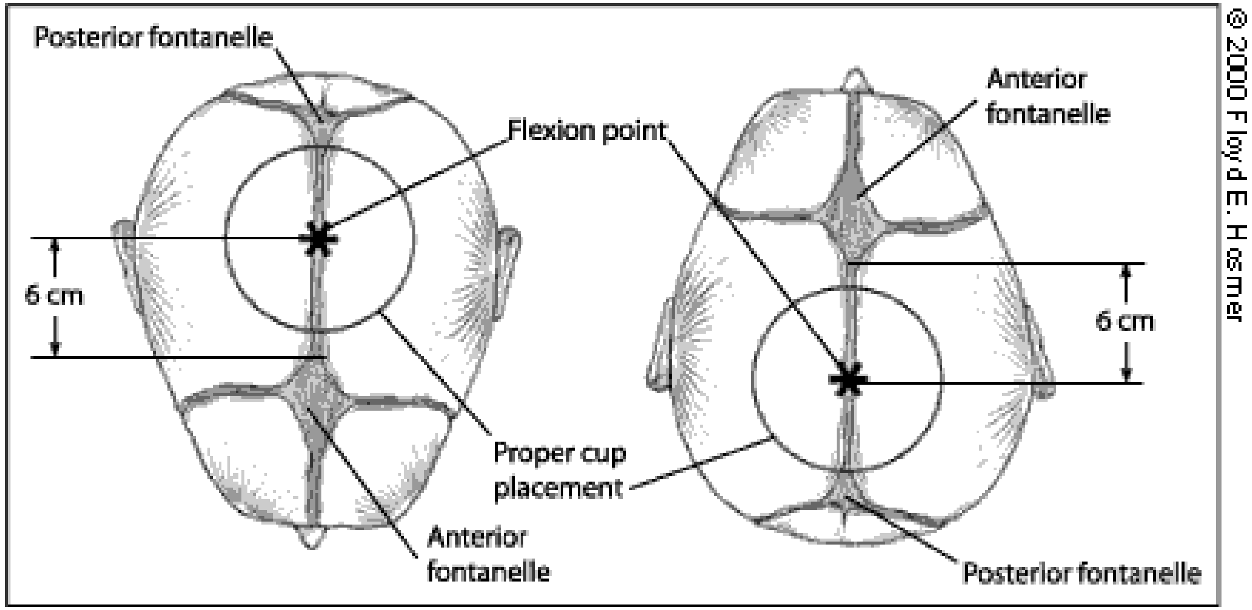
-traction during contraction simultaneously with pushing

-episiotomy

-removal when head is delivered

Instrumental delivery: application

Vacuum application



Caesarean section: definition

-delivery of fetus through an abdominal and uterine incision

-laparotomy followed by hysterotomy

-descriptions since ancient Greek and Roman times

-500BC until middle ages: crude procedures, mortality rate high,
uncertain outcome

-modern era development: since late 1800s, mortality rate reduction

Caesarean section: epidemiology

-rate: number of c/s over the total number of livebirths

-WHO: suggested rate of 10-15% (remains controversial)

-rate: increasing over the years for a number of reasons

-alternative indicator for measuring access to medical care

-availability of medical care (hospital care)

-development of fetal wellbeing methods (ultrasound, cardiotocography)

-medicolegal reasons (no offer breech, twin delivery or VBAC, CPD definition)

-demographic changes: high BMI, advanced maternal age, medical conditions

-development of IVF techniques: multiple pregnancy, advanced maternal age

Caesarean section: epidemiology

-study by Betran (2002):

Global rate: 15%

Africa: 3.5% (0.4-15.4%)

Asia: 15.9% (1.0-40.5%)

Europe: 19% (6.2-36.0%)

America: 29.2% (1.7-39.1%)

Developed countries: 21.1%

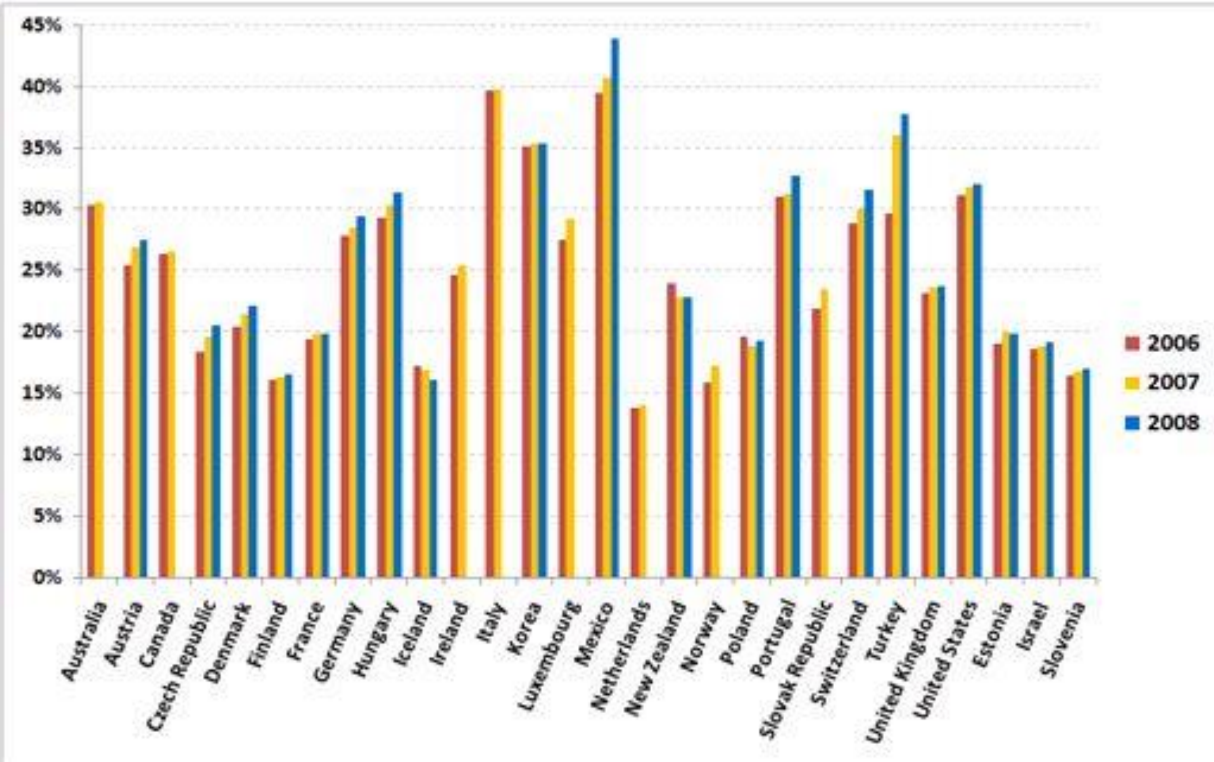
Developing countries: 14.2%

Underdeveloped countries: 2.0%

Caesarean section: epidemiology

-OECD countries data:

among highest in the world



Caesarean section: epidemiology

-etiologies:

elective or repeat c/s due to previous c/s: 30%

cephalopelvic disproportion (dystocia): 25-35%

fetal distress: 20%

abnormal presentation (breech): 4%

Caesarean section: classification

According to urgency

i. Grade 1: emergency

-immediate threat to the life of mother or fetus

-placental abruption, fetal distress

ii. Grade 2: urgent

-no immediate risk to the life of mother or fetus but delivery should be achieved as soon as possible.

-cephalopelvic disproportion

-Grade 1-2: intrapartum and within 20-30 minutes

Caesarean section: classification

iii. Grade 3: nonscheduled

-delivery needed but can fit with the workload and allow some planning
 (e.g steroid administration)

-IUGR, preeclampsia, PPROM

iv. Grade 4: scheduled-elective

-carried out at 38-39 weeks

-abnormal presentation, previous c/s

-Grade 1-4: prelabour

Caesarean section: indications

Maternal

-1 or 2 previous caesarean section scars

-lower segment obstruction: cervical leiomyoma, cervical cancer

-uterine surgery: myomectomy, hysterotomy

-retinal detachment, dilated aortic valve, heart failure

-inflammatory bowel disease: colectomy

-active HSV infection

-HIV infection

-preeclampsia, eclampsia, HELLP syndrome

Caesarean section: indications

Fetal

-abnormal presentation: breech, transverse

-multiple pregnancy: 1st twin non-vertex

-congenital abnormality: hydrocephalus, anencephaly, gastroschisis

-fetal distress: bradycardia, decelerations, low variability

-cephalopelvic disproportion

-umbilical cord prolapse

-macrosomia: fetal weight >4000-4500 gr

Caesarean section: indications

Placental

-placenta previa

-placental insufficiency: IUGR

-placental abruption

Caesarean section: preoperative evaluation

-confirmation: gestational age, placenta position, fetal presentation

-full blood count: hemoglobin, hematocrit, platelets

-grouping cross matching: RPC, FFP (if placenta previa: 4 RPC, 4FFP needed)

-fasting: 8 hours (elective)

-consent form: complications, indications

-abdominal shave

-foley's catheter placement

-antibiotics: within 30-60 minutes to skin incision, cephalosporin

Caesarean section: surgical technique

Skin incision

i. transverse:

-lower abdomen: Pfannenstiel or Joel-Cohen: 2-3cm above symphysis pubis, length: 12cm

-advantage: better healing, better cosmetic appearance

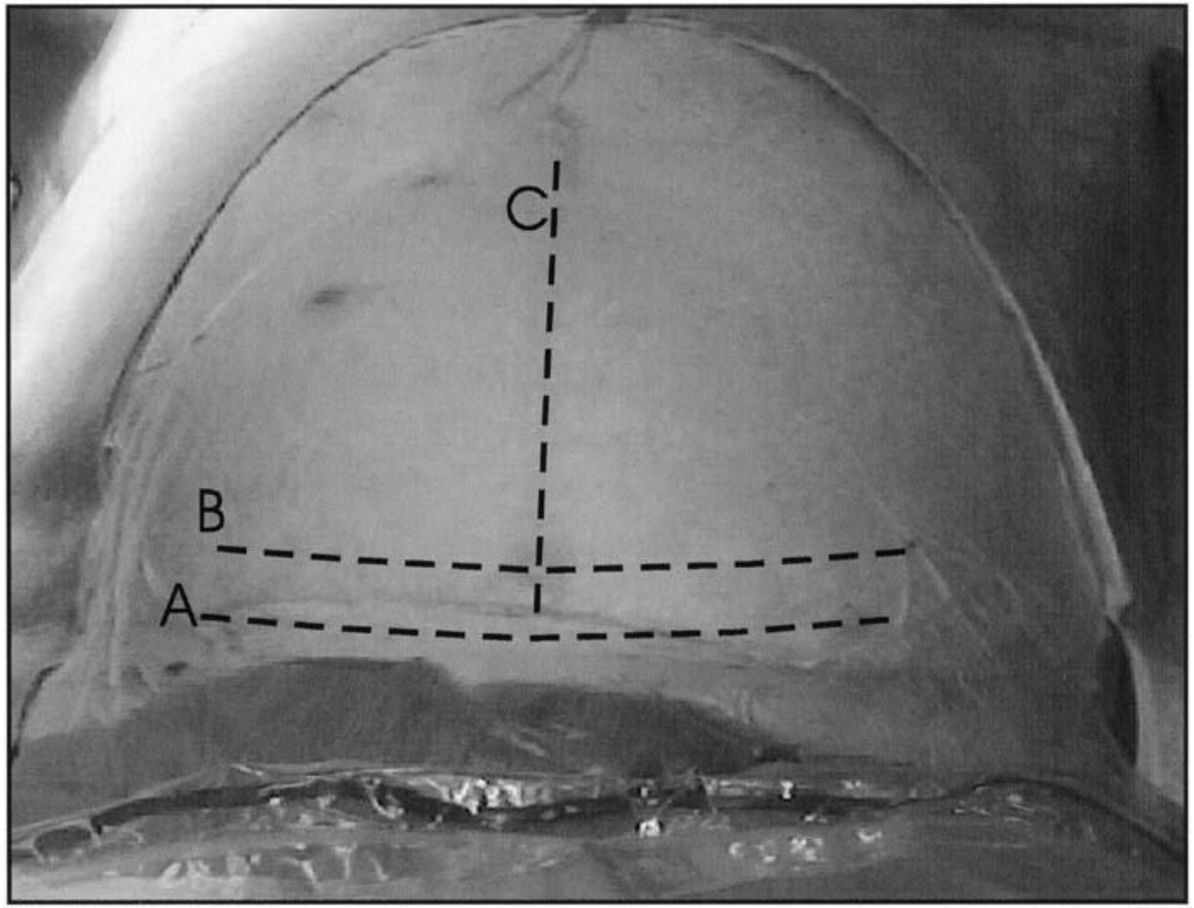
-disadvantage: less exposure, more time to reach uterus

ii. Vertical:

-midline

-indications: obesity, emergency, placenta previa

Caesarean section: technique



Caesarean section: technique

Subcutaneous tissue incision

Fascial layer incision

Rectus muscle separation

Peritoneum opening

Urinary bladder flap creation

Caesarean section: technique

Uterine incision (hysterotomy)

i. Low transverse:

-2-3 cm below utero-vesical fold

-used in 90% of cases

-advantages: less bleeding, better approximation, less uterine rupture in next pregnancy

-disadvantages: bleeding in placenta previa, bladder injury in adhesions, worse access to a premature, transverse fetus

Caesarean section: technique

Uterine incision (hysterotomy)

i. vertical:

-parallel to the longitudinal axis of uterus

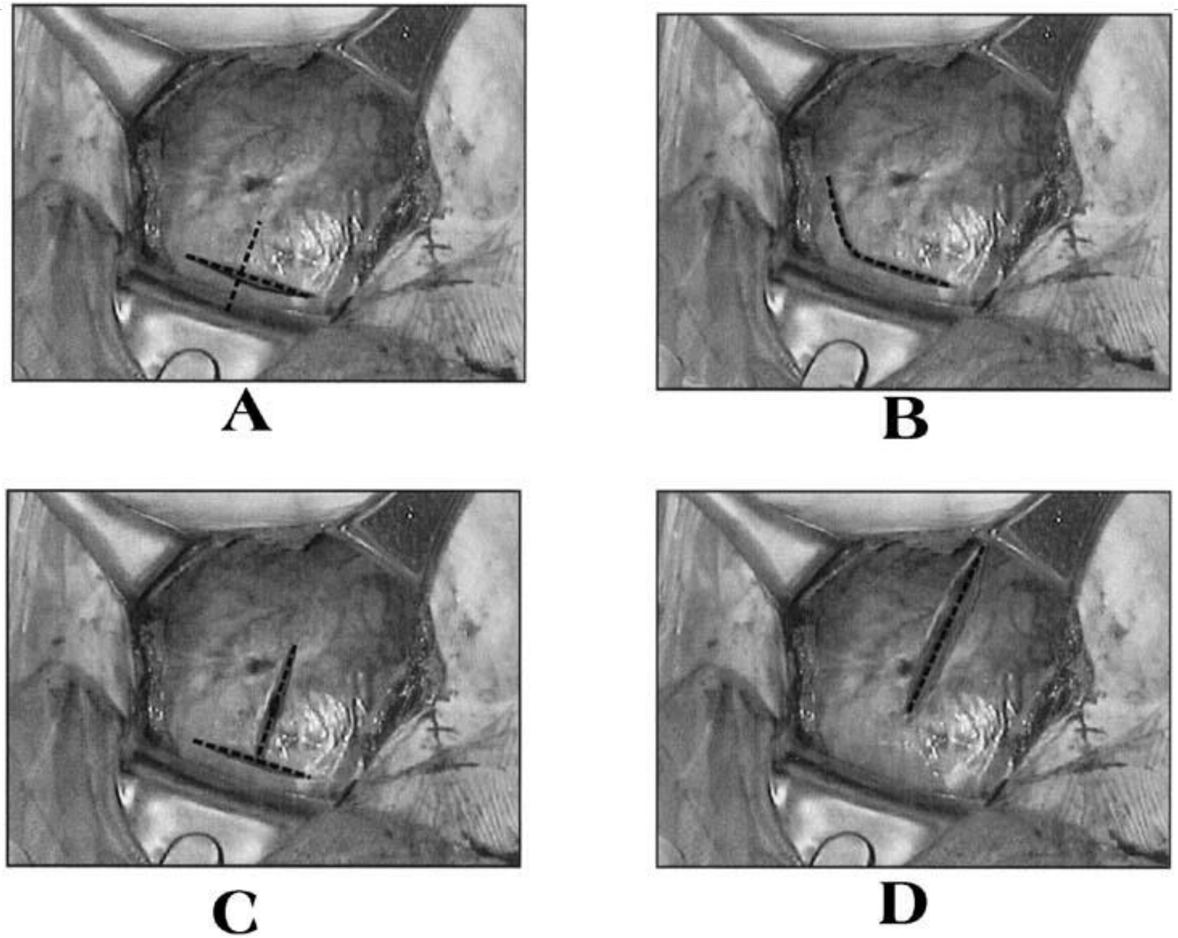
-used in 10% of cases

-advantages: no bleeding in placenta previa, avoid bladder injury, better access in premature, transverse fetus

-disadvantages: more bleeding, worse re-approximation, more uterine rupture in next pregnancy

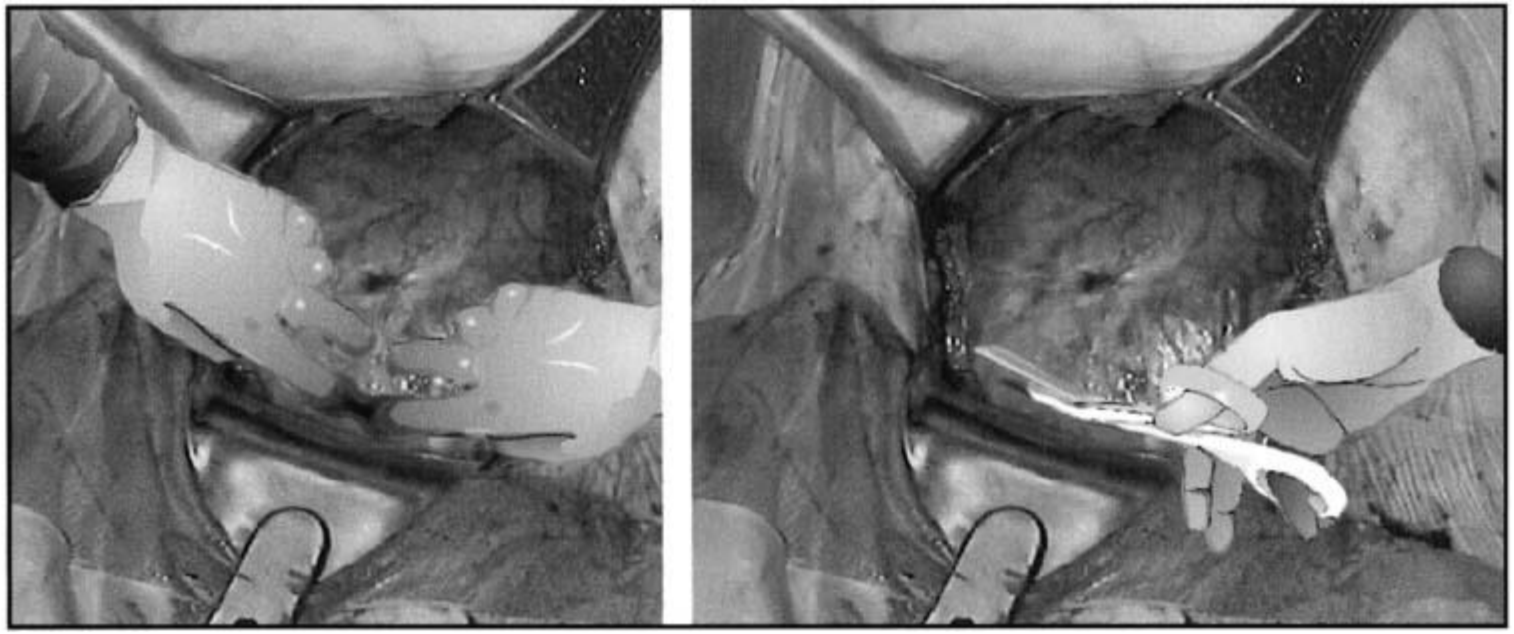
Caesarean section: technique

Uterine incisions



Caesarean section: technique

Low transverse



Caesarean section: technique

Delivery of fetus

i. Cephalic presentation

-dominant hand fingers: around head curvature for leverage

-head: elevated and flexed to bring occiput to open hysterotomy, guide through

+transabdominal fundal pressure by assistant

-difficult: preterm, impacted, floating, abnormal lie

ii. Breech presentation

-both hands: at lateral aspects of fetal pelvis, delivery of feet (anterior, posterior

Caesarean section: technique

Umbilical cord clamping

Delivery of placenta

-umbilical cord traction or spontaneous extraction

-oxytocin infusion

Uterine exteriorization

-better view

Uterine cavity inspection

-clear of placenta or membranes remnants, bleeding or not from vascular bed

Uterine contraction

Caesarean section: technique

Uterine incision closure

-delayed absorbable suture: monocryl or vicryl 0

-one or two layer, continuous, full thickness, locked or not

-one layer has similar rate of wound infection, bleeding, shorter time

Uterovesical peritoneal flap closure

-not necessary

Abdominal cavity inspection

-ovaries, tubes, bladder, bowel

-hemostasis

Caesarean section: technique

Peritoneum closure

-not necessary

Rectus muscle re-approximation

-not necessary

Fascia closure

-necessary: one layer, continuous, vicryl 0

Subcutaneous tissue closure

-if thickness is >2cm

skin closure

Caesarean section: postoperative care

Monitoring

-airway control, cardiorespiratory stability, communication: recovery

-vital signs (respiratory rate, blood pressure, heart rate): hourly for 12 hours

-urine output: 12 hours

-uterine tone, vaginal bleeding: as vital signs

Hemoglobin: no routine use if no PPH

Caesarean section: postoperative care

Analgesia: diamorphine (epidural, spinal), opioids, NSAID

Urine catheter removal: after mobilization

Ambulation: early

Fluid, food intake: 6 hours after c/s

Wound care: dressing removal in <24 hours, loose clothes

LMWH: if indicated

Caesarean section: complications

Endometritis: 6-11%, more frequent in unplanned c/s

Wound infection: 1-2%

Necrotizing fasciitis: 0.18%

Haemorrhage: 2-4%, uterine atony, accreta, extension of incision, hematoma

Bladder injury: higher in repeat c/s and during 2nd stage of labour

Venous thromboembolism: 246/ 100 000 c/s (higher than vaginal delivery)

Paralytic ileus: 10-20% of c/s

Caesarean section: complications

Placenta previa: 1 c/s: 4/1000 deliveries, 3 c/s: 28/1000 deliveries

Placenta accreta: previa + no c/s: risk 4%, previa + 3 c/s: risk 50%

Uterine rupture: depends on type of hysterotomy incision and VBAC attempt

Caesarean scar pregnancy

References

1. Charles, A, Glob. libr. women's med., (ISSN: 1756-2228) 2011; DOI 10.3843/GLOWM.10131.

2. American College of Obstetricians and Gynecologists: Operative Vaginal Deliveries. Technical Bulletin No. 196. Washington, DC, ACOG, 1994.

3. Greis JB, Bieniarz J, Scommegna A: Comparison of maternal and fetal effects of vacuum extraction with forceps or cesarean deliveries. Obstet Gynecol 57: 571, 1981.

References

4. Naji, O, Abdallah, Y, et al, Glob. libr. women's med.,(ISSN: 1756-2228) 2010; DOI 10.3843/GLOWM.10133.

5. Betrán AP, Merialdi M, Lauer JA et al: Rates of cesarean section: analysis of global, regional and national estimates. Paediatr Perinat Epidemiol. 2007 Mar; 21(2): 98-113.

6. Story L, Paterson-Brown S: Cesarean deliveries: indications, techniques and complications. Chapter 10: Best Practice in Labour and Delivery, ed. R. Warren and S. Arulkumaran. Published by Cambridge University Press 2009.

UNIVERSITY
of NICOSIA

MEDICAL SCHOOL