CAESAREAN SECTION 2.0

Caesarean section (CS), like most other surgical procedures, needs careful planning and preparation to ensure no unwanted complications occur.

Preoperative issues

Terminology

Operative abdominal delivery can be classified as either:

- Planned (elective) or
- Un-planned in which case the surgery is either:
  - Extremely urgent (maternal or fetal immediate life-threatening conditions)
  - Urgent (maternal or fetal compromise without immediate life-threatening situation) or
  - Emergency (no maternal of fetal compromise but require early delivery).
- Planned delivery refers to a situation where the delivery could be scheduled electively to accommodate either the patient or staff.

Fetal lung maturity

- Iatrogenic lung disease of the newborn could result from elective delivery prior to term. It is therefore advised that elective deliveries need to be planned after 39 weeks gestation.
- Amniocentesis to assess fetal lung maturity is indicated if elective caesarean section is planned at <39 weeks in a patient with no medical or obstetrical complications and who does not meet the following criteria:
  - It has been > 36 weeks since a serum or urine human chorionic gonadotropin pregnancy test was positive.
  - Fetal heart tones have been documented for > 30 weeks by Doppler.
  - Ultrasound measurement at less than 20 weeks of gestation supports the gestational age.

Prevention of postoperative infection

CSs are prone to post-operative infection, especially if performed during labour, as an emergency procedure. Precautions to prevent infection:

- Wash the abdomen with an antiseptic soap and
- Do NOT shave the abdominal wall (increases risk of infection). If excessive hair growth – trim with scissors
- Prophylactic antibiotics should be administered for ALL CSs as this reduces the risk of infection-related complications and serious infection post-surgery.
- Antibiotic prophylaxis:
  - A first-generation cephalosporin e.g., cefazolin 2g IV at the time of the operation.
  - Pre-incision broad-spectrum antibiotics are more effective in preventing post-CS

infections than post-clamping narrow-range antibiotics, without prejudice to neonatal infectious morbidity.
    - Associated risk factors for postpartum infection include multiple vaginal examinations and offensive amniotic fluid. If infection is found at the time of surgery (such as offensive liquor), commence therapeutic antibiotic therapy to prevent the infection spreading or developing postpartum sepsis.

Fetal wellbeing

It is important for the surgeon to know the fetal condition prior to surgery (especially in emergency CS where the fetus may be compromised).

For planned (elective) procedures: If the non-stress test is reactive, no further monitoring is indicated. If non-reactive tracing, prolong the monitoring.

For emergency procedures:
There needs to be continued monitoring of the fetus. This should be at least with intermittent auscultation of the fetal heart. The use of CTG has not been shown to improve perinatal outcome but may be a good form of monitoring in areas under-served with staff to provide care to the women during labour. Persistent pathological CTG traces may indicate fetal distress. If CS for fetal distress - establish that the baby is still alive pre-procedure.

Thromboembolism prophylaxis

Pulmonary embolism is a risk during the puerperium and early mobilization after surgery is advised in all cases, especially for low-risk women.

Thromboprophylaxis needs to be given to ALL women with:

- Any CS in labour. Emergency CS is a major contributor to thrombo-embolism and should be regarded as an indication for prophylaxis: Enoxaparin (Clexane) 40 mg daily or sodium heparin 10,000 iu 2x per day.
- Previous history of thrombo-embolism
- BMI > 40kg/m2 at booking
- Admission of 3 days or more
- Significant co-morbidities

For elective CS in women without these risk factors, there must be an additional risk factor to justify thromboprophylaxis (see Thromboprophylaxis guideline). The following conditions in women undergoing a planned (elective) abdominal delivery are an indication for thromboembolism prophylactic medication:

- Older than 35 years
- Parity of 3 or more
- Overweight: BMI 30-40 kg/m2 at booking
- Labour duration 12 hours or more
- Current infection
- Gross varicose veins
- Pre-eclampsia
- Twin gestation
- Preterm delivery

- Stillbirth
- Mid-cavity assisted delivery
- More than 1 litre bloodloss
- Major current illness
- Immobility
- Smoker

Bladder catheterization

- Current practice is to place an indwelling catheter (using sterile techniques) for CS.
- If there is no need for urine output monitoring early removal of the catheter post-surgery is recommended.

Pre-operative laboratory investigations

- Baseline haemoglobin (Hb) must be available. If the Hb was done in the preceding 4 weeks that should be sufficient if the patient is in a stable condition.
- Urea, electrolytes and platelet counts are not required routinely in healthy women. Indications for urea and electrolyte investigations include pre-eclampsia, endocrine disease and the presence of sepsis.
- Platelet counts are essential in pre-eclamptic women and advisable in HIV infected women, especially in the presence of anaemia or advanced disease.
- In women with clinical abruptio placenta, at least a hand clotting time must be done prior to surgery if coagulation tests could not be done.

Aspiration prophylaxis

- Uncomplicated labouring patients: Oral intake of modest amounts of clear liquids may be allowed but solid foods should be avoided.
- Patients with additional risk factors for aspiration (e.g., morbid obesity, diabetes, difficult airway) or patients at increased risk for operative delivery (e.g., non-reassuring fetal heart rate pattern) may have further restrictions of oral intake, determined on a case-by-case basis
- Uncomplicated patient undergoing elective CS may have modest amounts of clear liquids up to 2 hours before induction of anaesthesia but should otherwise be NPO for 6-8 hours
- Medical aspiration prophylaxis:
  Scheduled CS (not in labour)
  Cimetidine 200mg PO 12 hours & 2 hours pre-operatively
  Metroclopramide 10mg PO 2 hours prior to surgery
  Sodium citrate 0.3M 30ml not > 30 minutes pre-operatively
  Emergency CS (in labour)
  Cimetidine 200mg slowly IV
  Metroclopramide 10mg IV
  Sodium citrate 0.3M 30ml not >30 minutes pre-op

Informed consent

The obstetrician who will be performing the procedure is responsible to provide appropriate information and obtain informed consent for performing a CS.

Antenatally: Provide evidence-based information about CS:

- indication for CS (such as presumed fetal compromise, failure to progress in labour, breech presentation)
- what the procedure involves
- associated risks and benefits. Specifically refer to the risk of pulmonary embolism and increased risk for PPH.
- implications for future pregnancies and birth after CS

Elective CS:

- Record all the factors that influence the decision (especially those most influential).
- Written informed consent with additional notes to be kept in the patient records.
- Women from the age of 12 can give informed consent for operative procedures, although the obstetrician should ensure that a child under 16 understands the implications.

POST OPERATIVE ISSUES

Post operative care commences at the point when the patient is signed out of the theatre.

Careful documentation of all theatre events must be completed by the surgeon, anaesthesia professional and the theatre scrub staff.

Post-operative observation schedule

- Common complications after CS include postpartum haemorrhage and deterioration of preeclampsia and metabolic problems. These patients need to be regarded as having high risk for complications and should be subjected to a vigorous monitoring process in the first few hours post-delivery.
- If there is no dedicated recovery room the observations must be done in the theatre until the patient is stable to be transferred to the ward
- The use of colour coded early warning observation charts will assist staff to detect problems and notify the responsible medical practitioner
- Avoid sending a post-CS woman to a general ward where observations are difficult to perform.
- Vital information such as colour, level of consciousness, pulse rate, blood pressure, respiratory rate, vaginal blood loss, bleeding on operated site must be observed at regular intervals:
    - Quarter hourly while in the recovery room*
    - Half hourly for a further 2 hours
    - 2 hourly for a further 4 hours
    - 4 hourly for a further 12- 16 hours.

NB! Any abnormality detected at any stage requires more frequent observations and notification of the surgeon.

Post-operative pain management

- Adequate postoperative analgesia following CS hastens ambulation, decreases maternal morbidity, improves patient outcome, and facilitates care of the newborn.
- There is unfortunately no gold standard.
- International standards include the use of intrathecal opioids, self-administering of analgesia and local infiltration to reduce the needs of morphine post operatively.
- The choice of options is determined by drug availability, regional and individual preferences, resource limitations and financial considerations.
- IMI morphine or pethidine remains the gold standard, augmented by NSAIDs.
- Analgesia is often provided by the anaesthetist as part of a pain relief program. If this is not possible, it is advised that intramuscular pethidine in combination with a non-steroidal analgesic be used for pain relief.
- Pethidine is the drug of choice with an optimal dose of 1 mg/kg every 4-6 hours for the first 24-hours. In high care settings this could be given as an intravenous infusion at a rate of 10mg/h irrespective of the weight and individual demand of the patients.

Post-operative fluids and meals

- Post-operative management can include early feeding. Advantages of early post-operative feeding is that IV lines can be removed earlier, earlier mobilization and earlier initiation of breastfeeding.
- There is no advantage of restriction to clear fluids-only compared to unlimited solid fluids given within 30 min of a spinal anesthesia.
- General anaesthesia – allow fluids firstly, then if tolerated – full meals.
- Patients who are not able to manage oral fluid and food intake, should remain on an IV infusion of a maintenance fluid at a rate of 3 litres per day unless there are challenges with the fluid output.

Post operative wound care

The occurrence of a wound complication is the most important factor influencing post-operative patient satisfaction.

- Management of the surgical wound starts with surgery.
- There is no evidence that there is any advantage in keeping the wound covered for longer than 24-48 hours.
- The dressing should be removed without resulting in any further trauma.
- The wound should then be kept open and dry. If the wound is exposed to friction from the clothes, it could be covered with a dry dressing to avoid unnecessary trauma to the wound.
- Patients can clean their wound with tap water (of a standard that it is drinkable).
- Observe the wound site for signs of separation, tenderness, discharge, localised heat or swelling, and redness around the incision line.
- Typical symptoms of local infection are increasing pain and throbbing. The wound will be swollen and red and may have some oozing of a purulent fluid.
- Other common wound complications are wound haematoma and wound dehiscence.
- Advise the patient to have the sutures removed (if indicated) in 3-5 days (transverse abdominal incisions) and 6-10 days (longitudinal incisions).

Baby care and Feeding

- Initiate breastfeeding ASAP post-delivery including early skin-to-skin contact with the baby.
- Commence earlier in patients with regional anaesthesic compared to general anaesthetic.
- Sufficient pain relief will assist in getting the mother to comply with breastfeeding.
- Support with initiating breastfeeding is essential. It is important to reassure the women that breastfeeding is a skill and needs to be learnt.
- Sore nipples, painful breasts and a perceived lack of milk are the same as after vaginal delivery and should be attended to in the post-operative period. Physiotherapists may assist with breast USS or UV light therapy.

SAFETY AND CAESAREAN SECTIONS

Like with any surgical procedure, it remains the responsibility of the health care workers to ensure the safety of patients exposed to operative deliveries.

Basic safety checklists assist health care workers of all professions to ensure that safety is maintained.

CAESAREAN DELIVERY SAFETY CHECKLIST

Sign In

BEFORE INDUCTION OF ANESTHESIA

(to be said aloud)

Patient have confirmed

- her identity
- that consent was signed
    - Caesarean section
    - Sterilization
    - Type of abdominal incision

Anaesthetics doctor

- Anaesthetic equipment is checked and operational.
- pulse oximetry on patient
- Risk factors:
    - Allergy
    - Risk of bleeding/blood loss
    - Potential difficult intubation
    - Acid prophylaxis

Obstetrician

- condition of fetus (alive/dead)
- Assistant present

Paediatrician

- Present in theatre
- Neonatal resuscitation equipment checked

Midwife

- Present in theatre
- Baby warmer on and functional

TIME OUT

BEFORE SKIN INCISION

(to be said aloud)

Theater team

- Identify each other including roles
- Verbally confirm
    - The patient
    - Procedure

Anaesthetics doctor

- Are there any specific concerns
- Confirm that prophylactic antibiotics was given

Obstetrician

- What are critical or expected events
    - Duration of procedure
    - Anticipated blood loss

Pediatrician

- Present in theatre
- Neonatal resuscitation equipment checked

Nursing team

- Has sterility been confirmed
- Any equipment concerns
- Ready to receive baby

Authorship

These guidelines were drafted by a clinical team from Mediclinic and were reviewed by a panel of experts from SASOG and the BetterObs clinical team in 2019 and revised by the scientific subcommittee of BetterObs in 2022. All attempts were made to ensure that the guidance provided is clinically safe, locally relevant and in line with current global and South African best practise. Succinctness was considered more important than comprehensiveness.

All guidelines must be used in conjunction with clinical evaluation and judgement; care must be individualised when appropriate. The writing team, reviewers and SASOG do not accept accountability for any untoward clinical, financial or other outcome related to the use of these documents. Comments are welcome and will be used at the time of next review.

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