CS late complications and VBAC

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Postoperative complications

- **Infection**
  - Women undergoing caesarean section have a 5–20-fold greater risk of an infectious complication when compared with a vaginal delivery.
  - Complications include fever, wound infection, endometritis, bacteraemia and urinary tract infection.
  - Other common causes of postoperative fever include haematoma, atelectasis and deep vein thrombosis.
Risk factors for infection:

1. Labor, its duration
2. the presence of ruptured membranes $\rightarrow$ most important factor
3. Obesity

The most important source of microorganisms responsible for post-caesarean section infection is the genital tract, particularly if the membranes are ruptured preoperatively. Even in the presence of intact membranes, microbial invasion of the intrauterine cavity is common, especially with preterm labor.
Infections are commonly *polymicrobial* and pathogens isolated from infected wounds and the endometrium include *Escherichia coli*, other aerobic gram-negative rods and *group B streptococcus*.

**General principles for the prevention of any surgical infection include:**

1. careful surgical technique and skin antisepsis
2. prophylactic antibiotics should be administered to reduce the incidence of postoperative infection.
Deaths from pulmonary embolism remain an important direct cause of maternal death, and caesarean section is a major risk factor. The incidence of such complications can be reduced by adequate hydration, early mobilization, administration of prophylactic heparin. Early recognition and prompt initiation of treatment will reduce the consequences of venous thromboembolism.
All difficult deliveries carry increased maternal psychological and physical morbidity. The psychological wellbeing of women delivered by emergency caesarean section may be compromised by delayed contact with the baby, a factor that in most cases should be amenable to remedy. The obstetrician who performed the delivery should review the woman prior to hospital discharge to discuss the indication for delivery, the potential for complications, the implications for the future and to answer any questions she or her partner may have.
Uterine Dehiscence and/or Rupture

* A dehiscence is a frequently asymptomatic separation and is found incidentally at the time of repeat cesarean or on palpation after a vaginal birth.

* Uterine rupture: sudden separation of the uterine scar and expulsion of the uterine contents into the abdominal cavity. Fetal distress is usually the first sign of rupture, followed by severe abdominal pain and bleeding.

Repeat Cesarean Delivery

* Over 90% of women who undergo cesarean delivery have a repeated procedure in subsequent pregnancies.

* Increase risk of adhesions formation, abnormal placentation, incisional hernia, etc.
Severe obstetric complication involving an abnormally deep attachment of the placenta to the myometrium without penetrating it.

1 in 4 patients who undergoes repeat cesarean delivery because of placenta previa will require cesarean hysterectomy for hemorrhage caused by placenta accreta.

Incidence: 4% with no C/S, 25% with 1 C/S, and 40% with 2 C/S

Hysterectomy after cesarean delivery is an emergency procedure that occurs in less than 1 in 1000 of cesarean sections.

Indications include:

Uncontrollable maternal Hemorrhage (most common), uterine atony (43%), placenta accreta (30%), uterine rupture (13%), extension of a low transverse incision (10%) and large fibroids (prevent closure or hemostasis)
Subsequent birth following caesarean section

- Caesarean section rates for primigravida are 20–30%.
- Historically they believed that ‘once a caesarean, always a caesarean; but actually up to 70% of women with a previous caesarean section who labor achieve a vaginal delivery.
- Elective repeat caesarean section (ERCS) as compared to attempted vaginal birth after caesarean section (VBAC).

From a maternal perspective, ERCS avoids labour with its risk of pelvic floor trauma (urinary and faecal problems), the need to undergo emergency caesarean section and scar dehiscence or rupture with subsequent morbidity and mortality. However, ERCS carries maternal risks: increased bleeding, febrile morbidity, prolonged recovery, thromboembolism, long-term bladder dysfunction and increased risks of placenta previa in subsequent pregnancies. From a fetal perspective, ERCS reduces the risk of scar rupture, but increases the risk of TTN (Transient tachypnea of the newborn) /respiratory distress syndrome.
Summary of the advantages and disadvantages of tolac

**Advantages**

1. **Maternal:**
   - Lower rates of maternal morbidity, intrapartum hemorrhage, Postpartum fever, Wound infection, Blood transfusion, Hysterectomy, postoperative pain and thromboembolic events.
   - Shorter hospital stay and quicker return to normal activities.
   - Lower risk of subsequent pregnancy complications (placenta previa and accreta)

2. **Fetal:**
   - Decrease risk of neonatal respiratory distress and NICU admission rate

**Disadvantages**

1. Uterine rupture: 1 in 200
2. Peripartum hysterectomy
3. Higher risk of Fetal death: 1 in 750
4. If VBAC is unsuccessful (failed TOLAC), increased risks of complications as compared to ERCS, i.e., double risk of infection.
5. Induction with prostaglandins or misoprostol contraindicated
Uterine rupture

- Nonsurgical complete disruption of all uterine layers, including the serosa, which usually leads to bleeding and extrusion of all or part of the fetal-placental unit.

- It is a life-threatening pregnancy complication for both mother and fetus.

- Other adverse outcomes include complications related to severe hemorrhage, bladder laceration, hysterectomy, and neonatal morbidity related to intrauterine hypoxia.

- Most uterine ruptures in resource-rich countries are associated with a trial of labor after cesarean delivery (TOLAC).

- In resource-limited countries, many uterine ruptures are related to obstructed labor and lack of access to operative delivery.
### TABLE 31-3. Types of Prior Uterine Incisions and Estimated Risks for Uterine Rupture

<table>
<thead>
<tr>
<th>Prior Incision</th>
<th>Estimated Rupture Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical</td>
<td>2–9</td>
</tr>
<tr>
<td>T-shaped</td>
<td>4–9</td>
</tr>
<tr>
<td>Low-vertical&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1–7</td>
</tr>
<tr>
<td>One low-transverse</td>
<td>0.2–0.9</td>
</tr>
<tr>
<td>Multiple low-transverse</td>
<td>0.9–1.8</td>
</tr>
<tr>
<td>Prior preterm cesarean delivery</td>
<td>“increased”</td>
</tr>
<tr>
<td>Prior uterine rupture</td>
<td></td>
</tr>
<tr>
<td>Lower segment</td>
<td>2–6</td>
</tr>
<tr>
<td>Upper uterus</td>
<td>9–32</td>
</tr>
</tbody>
</table>

<sup>a</sup>See text for definition.

Data from the American College of Obstetricians and Gynecologists, 2013a; Cahill, 2010b; Chauhan, 2002; Landon, 2006; Macones, 2005; Martin, 1997; Miller, 1994; Sciscione, 2008; Society for Maternal-Fetal Medicine, 2012; Tahseen, 2010.
Clinical manifestations of uterine rupture

- Fetal bradycardia
- Variable or late decelerations
- Maternal hypotension/shock
- Vaginal bleeding
- Cessation of contractions
- Loss of station/fetal presenting part
- Abdominal pain
Complications of uterine rupture

- Maternal mortality very rare
- Fetal morbidity/mortality more common
  - Fetal asphyxia occurs in 5%
  - Perinatal morbidity/mortality highest when fetus extruded into abdomen or when interval between bradycardia & delivery exceeded 18 minutes.
Candidates for TOLAC (Optimal)

One prior low transverse uterine incision:

- TOLAC success rate of 60 -80 %
- estimated uterine rupture rate of 0.4 - 0.7 %.

Characteristics that increase the probability of successful TOLAC in this population:

1. A successful vaginal delivery before or after their primary cesarean delivery
2. A nonrecurring indication for their primary cesarean delivery (malpresentation)
3. Spontaneous labor on admission to the labor unit
4. Fetal weight less than 4000 g
5. Demographic factors (higher success rate in non-Hispanic white women, <35 years old, increase maternal height and BMI level <30 kg/m2)
6. Interpregnancy interval more than six months (or 18 months)
7. Absence of maternal medical disease
8. Delivery in a university hospital with immediate availability of OR, anesthesiologist, and obstetrician
<table>
<thead>
<tr>
<th>Increased Chance of Success of TOLAC</th>
<th>Decreased Chance of Success</th>
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<tbody>
<tr>
<td>Prior vaginal delivery</td>
<td>Maternal obesity</td>
</tr>
<tr>
<td>Prior VBAC</td>
<td>Short maternal stature</td>
</tr>
<tr>
<td>Spontaneous labor</td>
<td>Macrosomia</td>
</tr>
<tr>
<td>Favorable cervix</td>
<td>Increased maternal age (&gt;40 y)</td>
</tr>
<tr>
<td>Nonrecurring indication (breech presentation, placenta previa, herpes)</td>
<td>Induction of labor</td>
</tr>
<tr>
<td>Preterm delivery</td>
<td>Recurring indication (cephalopelvic disproportion, failed second stage)</td>
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<tr>
<td></td>
<td>Increased interpregnancy weight gain</td>
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<tr>
<td></td>
<td>Latina or African American race/ethnicity</td>
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<tr>
<td></td>
<td>Gestational age ≥41 wk</td>
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<tr>
<td></td>
<td>Preconceptional or gestational diabetes mellitus</td>
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</tbody>
</table>
Induction of labor in attempted VBAC

- **Spontaneous labor** is most successful & has lowest rate of uterine rupture
- **Misoprostol** should never be used
- Follys Catheter to ripen the cervix
- Rates of rupture shown in U.W. study (2001 NEJM) differed by method of induction:
  - Spontaneous labor - 0.52%
  - Induction without prostaglandins - 0.72%
  - Induction with prostaglandins – 2.45%

  - The risk of uterine rupture was **not increased** in those who underwent either amniotomy/oxytocin or foley catheter induction
  - but was **significantly increased** in those who underwent a prostaglandin E2 induction