

Review Article

History of caesarean in Section

Sheth Shirish S¹, Paghdwalla Kurush²

Consultant Gynecologist, Breach Candy Hospital, Sir Harkisondas Nurrotamdas Hospital and Saifee Hospital, Mumbai, Maharashtra, India.

Abstract

Cesarean section once performed, paves the way for a repeat cesarean often, which in turn results in multiple disadvantages. An attempt is made to view the place of vaginal birth after cesarean against the consequences of not giving such a trial and choosing to perform a repeat cesarean section. The aftermath and repercussions of a previous cesarean section on future obstetric and gynecological outcomes are hereby presented.

Introduction

The adherent bladder can pose multiple problems in future pregnancies or in any type of hysterectomy. The increasing incidences of Cesarean sections multiplies these problems.

The prevalence of cesarean delivery (CD) is high in many parts of the world, more so in private practice. In the United States it is at a record high of 31.1% of all births, representing an increase of 50% in the past decade¹. In certain emerging economies, such as Brazil, CD rates, exceed 75% in the urban private sector². In Brazil there are hospitals with cesarean section (CS) rates of 100% and some health districts with an 85% CS rate. In Sweden, Denmark and Netherlands the CS rate is close to 10% with one of the world's lowest maternal and perinatal morbidity and mortality rates³. Approximately 12% deliveries are estimated to occur by CD in the developing world – as low as 8% if births in

China are excluded⁴. The World Health Organization (WHO) advocates an “optimal” national CD rate between 5% and 15% of all births, which suggests that levels less than 5% sometimes indicate limited availability of cesarean facility for the rural and the poor of the world. Cesarean section rate in rural areas of Tanzania is 5% and 1.5 to 2.3% in Madagascar⁵.

Between 1989 and 1996 the total cesarean rate decreased due to a decrease in the primary CS rate and an increase in the rate of vaginal birth after cesarean (VBAC). Since 1996, these trends have reversed, and increases have been rapid and sustained for primary CS and repeat cesarean with a decrease in the VBAC rate from 28.3% to 9.2% and a corresponding increase in the repeat cesarean rate to 91% in 2004⁶. In the 1980s, the dictum “once a cesarean, always a cesarean,” espoused by Craigin in 1916, was revised in many countries, so as to reduce cesarean section rates.

Questions and controversy generated by the increasing trends

Is the increase of CS the result of changes in physician practice methodology regarding cesarean delivery, due to increase in maternal requests for cesarean section, or a combination of the two? Is the overall increase in

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Correspondence :
Dr. Sheth Shirish S
2/2, Navjivan Society, Lamington Road,
Mumbai 400 008, India.
Tel. 91-22-23084949/23098484 Email : silsal@bom2.vsnl.net.in

the cesarean rate the result of an increase in elective cesarean sections? What are the advantages and disadvantages of cesarean delivery for mothers and neonates?

The Myth and Reality

Incision choice.

The Pfannenstiel incision is a most commonly used incision in women having a first CS and is also used in case a repeat a CS is required. However some obstetricians believe that a vertical midline sub umbilical incision (MSU) prevents bladder and bowel injuries.

In a series of 3164 women having repeat CS between 1999-2003 in women with cesarean deliveries 86% had Pfannenstiel incision and 14% had MSU, bladder and bowel injuries were seen more in cases where MSU were done than with Pfannenstiel incision Pfannenstiel incision is stronger, less painful and with respiratory movements causes less pain than a midline incision⁷. A Pfannenstiel incision is often the best choice for a primary and or a repeat C.S. A MSU incision should be used only for compelling reasons.

Misgav Ladach and Joel Cohen incisions at cesarean delivery do not provide advantages at future obstetric or gynecological interventions. Exteriorization, of the uterus during suturing remains a personal choice in the absence of any convincing data to either way as per a systemic Cochrane review⁷⁻⁹.

Lower segment transverse incision is the choicest transversal expansion. Women with previous low vertical uterine incision were just as likely to have successful VBAC as women with a previous low transverse uterine incision¹⁰. Classical cesarean scar has a rate of uterine rupture in future pregnancies of 4% to 9% and is even higher in some areas.

There is virtually no role today for a classical C.S. except in some conditions. However it is prudent to perform a tubal ligation whenever this method is appropriated.

Peritoneal closure at primary caesarean delivery and adhesions¹

In patients where the parietal peritoneum was sutured at the first Cesarean Section there were fewer adhesions compared to those in whom the primary peritoneum was not sutured in the same setting(73%). This non randomized study raises questions about the practice

of not suturing the parietal peritoneum at Cesarean delivery. A controlled study showed that in those patients similar to the 73% described, there was an increased time taken to make the uterine incision due to adhesions in repeat Cesarean Sections as well as a longer operating time and an increase post operative analgesia. The National epidemiology unit at Oxford University is co-ordinating a multicentric trial of Cesarean Delivery techniques, the "Cesarean Rate study" concerning some aspects of C S eg a single or a double layer closure of the uterine incision, non closure of the parietal peritoneum and the usage of abdominal drains. However a review of literature including animal experiments, general surgery outcomes and gynaecological data encourages one to omit peritoneal closure¹³.

Hernias

The incidence of ventral hernia in patients with the vertical midline incision is 10% to 16%. The Smead Jones technique of interrupted closure when compared with the non locking continuous technique of closure of a vertical midline laparotomy incision found no difference in the incidence of a ventral hernia resulting, though the incidence of a burst abdomen got reduced to 50% when the technique of interrupted sutures was used. Ninety percent hernia occur within the first year of surgery. Risk for herniation includes BMI> 27, diabetes and wound infection. A single Pfannenstiel incision has a very low incidence of hernia occurring^{11,15}.

Can an incisional hernia be repaired at the time of repeat CS?. If a future pregnancy is desired it is not advisable. However, if not, it is worth repairing the hernia meticulously using special suturing material and not a mesh as an infection may result in severe complication and, necessitate removal.

Vaginal Birth After caesarean (VBAC)

Women with a prior history of one uncomplicated lower-segment transverse cesarean section, in an otherwise uncomplicated pregnancy at term, with no other contraindication to vaginal birth, should be able to discuss the option of planned VBAC or the alternative of a elective repeat cesarean section(ERCS).

Based on retrospective cohort studies, most women with one previous low-transverse cesarean delivery are candidates for vaginal birth and should be counseled and offered a trial of labor^{10,16}. Women considering their options for delivery after a single previous cesarean

should be informed that, while the chance of successful planned VBAC are 72-76% planned VBAC carries a risk of uterine rupture of 22-74/10,000. There is virtually no risk of uterine rupture in women undergoing ERCS.

VBAC Rupture Rate

A meta-analysis of articles published in the period 1982-1989 failed to identify advantages for elective repeat cesarean delivery, compared with trial of labor, with regard to uterine rupture and perinatal death, in contrast, a meta-analysis published from 1989 to 1999 with a higher rate of uterine rupture and perinatal death following a trial of labor than following elective cesarean section ^{17,18}.

In a retrospective, population based review in Washington state USA a total of 20095 cases with a history of low transverse cesarean for first delivery, gave birth to a second child (1987 through 1996). The risk of rupture was compared amongst women who had repeat CD, vaginal deliveries following the spontaneous onset of labor and labor induced with or without prostaglandins. Rupture rate per 1000 varied from 1.6 in women with repeat CD, 5.2 with spontaneous labor and vaginal delivery and 7.7 when labor was induced without PG and 24.5 when induced with PG ¹⁹.

Maternal and Neonatal Morbidity

Uterine injury occurs in 1.3% and 0.4% of women undergoing TOL and ERCS, respectively, and the risk of uterine lesions is 3-fold greater in patients planning VBAC, compared with those undergoing ERCS. Additional intervention, in particular blood transfusion and hysterectomy, are seen with the same frequency in the two groups ²⁰. Four findings were supported by moderate level evidence. Medically elective cesarean delivery (compared with the combination of planned VBAC followed by emergency cesarean delivery) was associated with : (1) a decreased risk for maternal hemorrhage; (2) an increased risk for respiratory problems for infants; (3) greater complications in subsequent pregnancies, including uterine rupture and placental implantation problems, and (4) longer maternal hospital stay ²¹. Further comparison and analysis vis a vis failed vs. successful VBAC and ERCS, showed that women with VBA failure have an increased risk of maternal adverse outcomes compared with both latter groups. In particular, when a TOL fails, maternal morbidity is 17%, which is much higher than 3.1% assessed in women with a successful vaginal delivery.

Uterine lesions are also observed more often following a failed TOL (4.4%), in contrast to a successful VBAC (0.2%), and this finding might explain why blood transfusion and hysterectomy are more often required in the former than the latter group. Because the increased maternal morbidity in women attempting a TOL is primarily detected when TOL fails, it is mandatory identify factors associated with failed TOL prior to selecting patients as VBAC candidates. Therefore, many studies have focused on risk or predictive factors of unsuccessful VBAC. History of a previous spontaneous vaginal delivery before the initial cesarean delivery is an excellent favourable predictor for successful TOL.

In a global study of the relationship between method of delivery and maternal and neonatal mortality, found that for countries with overall caesarean rates below 15%, higher caesarean rates were correlated with lower maternal mortality. For countries with national caesarean rates above 15%, however, "higher caesarean rates are predominantly correlated with higher maternal mortality. A similar pattern is found for infant and neonatal mortality ²².

Women considering planned VBAC should be informed that this decision carries a 2-3/10,000 additional risk, of birth-related perinatal deaths when compared with ERCS. The absolute risk of such birth-related perinatal loss is comparable to the risk for women having their first birth. MacDorman and colleagues examined neonatal mortality using linked birth and infant death certificate data for 1998 to 2001 from 5.7 million births with NIR for cesarean delivery. They found that even in the most conservative model (excluding congenital anomalies and Apgar scores less than 4 and adjusting for socio-demographic and medical risk factors), the odds ratio for neonatal mortality for primary caesarean delivery was 1.73 compared with 0.72 by vaginal delivery.

A large study in Latin America showed cesarean section has not necessarily improved perinatal outcome contrary to data from developed countries ²³. Elective cesarean delivery was associated with greater respiratory morbidity, higher NICU admissions, greater hospital stay and increased risk of complications in subsequent pregnancies, when compared with planned vaginal delivery. No wonder, ACOG recommends for elective cesarean delivery on maternal request (CDMR)when performed, the estimated gestational age should be at least 39 weeks or lung maturity should be

confirmed. Elective CD before 39 weeks will have much greater morbidity²⁴.

Although comparisons are limited by differences in methodology between various studies, there seems to be more evidence now than at the time of the National Institute of Health (NIH) conference for an increased risk for maternal and neonatal mortality and morbidity for medically elective caesareans compared with vaginal births. In addition, the increase in the primary cesarean rate seems primarily the result of changes in obstetric practice and not due to changes in the medical risk profile of births or increases in maternal request²¹.

Intra-operative difficulties

Despite previous cesarean sections at times the intra-operative scenario may reveal no stigmata of previous surgery or disproportionately there may be severe adhesions following single previous cesarean section.

In a study of 1240 CS with 287 repeat CS, there was abdominal cicatrization in 24.3% and some adhesions between various intraperitoneal structures in 25.4%, these were the chief causes of difficulties at surgery. This resulted in inaccessibility to the lower segment in 4.5%, bladder injury in 2 cases and extensive ventrofixation of uterus causing an entry in to the uterine cavity in 1 case. Senior obstetricians had to intervene in difficult situations in 5.9% of cases emphasizing the importance of involving seniors in such surgical procedure²⁵.

Relaparotomy after CS

It is the least frequent complication in the early postoperative period²⁶. This had to be performed in 18 (0.53%) out of 3380 cases in Israel between 1996-2006.

Relaparotomy was required because of hemorrhage in 12 cases; eventration in 3 and intrabdominal abscess in 3.

VBAC outcome depends on

For a successful VBAC trial, ACOG recommends following:

- 1) Previous low transverse uterine incision
- 2) No contra indications, to VBAC
- 3) A pelvis judged to be adequate for vaginal delivery.
- 4) No other uterine scars (myometomy) or previous rupture uterus

- 5) Physician's availability in a shortspan of time to deal with other emergency situations including anaesthesia related¹⁰. A very recent review by Rossi²⁷ shows that TOL after previous caesarean section is associated with a successful rate of 73%.

Characteristics that favor VBAC are :

1. One previous CS
2. Maternal age under 35 years
3. Cervical dilatation greater than 4 cm at admission / favourable cervix,
4. Absence of obesity
5. Birth weight less than 4000 g²⁸ and normal delivery at least once in past will boost success chances by 9-28% than without it.
6. Interdelivery interval of 18 to 24 months after previous CS^{28,10}.
7. Scar thickness: Ultrasonographic measurement of scar thickness has been proposed as a method of predicting uterine rupture or scar dehiscence. Cut off value of 3.5 mm with only 11.8% positive predictive value¹⁹.

Characteristics that dissuade VBAC are :

1. History of dystocia
2. Multiple prior caesarean deliveries
3. Cephalopelvic disproportion
4. Reduced time interval between deliveries i.e.: <24 months has 2-3 times increased risk
5. Obesity²⁹.
6. Alcohol and cigarette use,

In practice it is important³⁰ to provide experience based skill, competence and evidence based services to women. Trial of scar (more often called trial of labour) has to be carefully supervised, a second opinion may be sought and ultimately targeted for a 10-15% cesarean section rate and not beyond 20%.

History of CS in past for dystocia is quite helpful as CS performed after full dilatation has poor success rate of 13% in contrast to 67-73% success if CS is performed before complete dilatation eg between 5-9 cms.

Study from California hospitals, of 40000 trial cases gives a 61.4% success rate with a 50-80% success in cases with dystocia and 75-86% success with a non recurring indication of CS in past. CS in the past for dystocia

needs an enquiry into the weight of baby, a reason for CS for the current pregnancy an estimated fetal weight and above all the center and / or the individual in charge during the previous cesarean delivery ¹⁰. Heredity accounts for 28% of the risk of developing dystocia. Cesarean delivery for cephalopelvic disproportion was associated with a 2 fold increased risk for the daughter having a similar CD and cesarean for dysfunctional labour increased the risk 6 fold for a similar delivery by a daughter ³¹.

What contraindicates VBAC? ¹⁰.

1. Previous classical or T shaped or extensive transfundal uterine surgery
2. Previous uterine rupture
3. Medical or obstetric complication that preclude vaginal delivery.
4. Inability to perform emergency delivery because of unavailability of surgeon, anesthesia, staff or required facility.

Induction and/or augmentation and VBAC

How should women with a previous caesarean birth be advised in relation to induction of labour or augmentation ?

Women should be informed of the two-to three-fold increased risk of uterine rupture and around 1.5 fold increased risk of cesarean section in induced and/or augmented labors compared with spontaneous labours. Oxytocin augmentation study in 1072 patients resulted in a rupture rate of 1% whereas with a spontaneous labor the rate was 0.4% ¹⁰.

Risk of uterine rupture is much higher in cases of induction of labor with prostaglandins and therefore discourages PG for ripening or induction in previous CS ¹⁰. Interestingly, the Royal College of Obstetricians and Gynaecologists state that in the case of TOL in women with prior cesarean delivery, vaginal prostaglandins appear to be safe ³².

The decision to induce, the method chosen the decision to augment with oxytocin, the time intervals for serial vaginal examination and the selected parameters of progress that would necessitate discontinuing VBAC should be discussed with the patient by the consultant obstetrician.

There should be careful serial cervical assessments,

preferably by the same person, for both augmented and non-augmented labors, to ensure that there is adequate cervicometric progress, thereby allowing the planned VBAC to continue.

For a clinical question: should women who have had a previous low-transverse cesarean delivery and who require induction of labor be offered a trial of labor? Evidence based answer is: There are no randomized controlled trials (RCTs) of labor induction in women with a low transverse uterine scar. Although induction in these patients is common practice in other countries, based on these data, the American College of Obstetricians and Gynecologists (ACOG) recommends that patients be discouraged from induction of labor after a single previous low-transverse cesarean delivery. Rupture risk increases after preinduction cervical ripening and is without risk benefit ratio favouring its use.

A study showed that using oxytocin to augment labor in women with a previous low transverse cesarean delivery increased the risk of uterine rupture compared with spontaneous labor (8.7 versus 3.6 per 1,000); using oxytocin alone to induce labor increases the risk to 10.7 per 1,000. In women undergoing a trial of labor, the overall uterine rupture – related perinatal death was 0.11 per 1,000. The rate of perinatal hypoxic brain injury was 0.46 per 1,000 trials of labor compared with zero in women who had a repeat cesarean delivery. Kayani and Alfirevic observed that of 107 women with previous cesarean section but with history of previous vaginal delivery induction of labor were successful in a subsequent pregnancy in 83% of cases, compared with 41% of women without experience of a previous vaginal delivery ^{10,19}.

Two or more previous CS: Risk of rupture is 5 times greater for 2 previous cesarean deliveries compared with 1 CD in past. Risk is 1-3.7%. Women with previous vaginal delivery followed by CD were approximately 25% likely to sustain a rupture during trial of scar. Therefore in women with two previous cesarean sections only those with a prior VD should be considered for spontaneous trial of scar ¹⁰. Repeat elective cesarean section performed after 2 cesarean sections in past, is acceptable as normal practice.

Women with a prior history of two uncomplicated low transverse cesarean sections, in an otherwise uncomplicated pregnancy at term, with no contraindication for vaginal birth, who have been fully

informed by a consultant obstetrician, may be considered suitable for planned VBAC. Success rate of VBAC after 2 or more CS is 71-72%³³. Interestingly a 79% rate of vaginal delivery rate is noted even with history of three or more previous cesarean section³⁴. However a decision to allow any woman for a VBAC trial after more than one previous section needs to be based on outcome of a bigger metanalytic study. Experienced dedicated obstetricians with the "will" to give the patient a fair chance, in the absence of unfavourable findings and in an ideal setting can undertake a trial for a VBAC after 2 previous CS.

Five or more CS was associated with greater operating time and increased rate of severe adhesions. Interestingly, the higher order 5 to 9 repeat CS carry no specific additional risk for mother or baby when compared with the lower order, 3 or 4 CS³⁵.

Obesity

Of five hundred ten women attempting TOL, 66% had successful VBAC and 34% needed repeat CS²⁹. Greatest success of VBAC was in underweight women (BMI<19.8) 84.7% compared average weight for height with women where the success was 70.5%. BMI>30 had 3 times chance of cesarean section than with BMI of 20 or less¹⁹. Increased CS rate obese women is associated with post-operative complications like wound infection, excessive blood loss and endometritis²⁹. Thus obesity can be associated with failure of TOL and increased maternal and perinatal morbidity. However a 66% success rate of VBAC in obese women is adequate to allow select patients a chance for a successful VBAC.

Post maturity

Gestation beyond 40 weeks: Induction in these cases was associated with increase risk of rupture. Strict clinical guidelines including the introduction of colour coded partogram is associated with decrease of rupture risk from 0.42% to 0.27%³⁶.

Fetal Macrosomia

With birth weight > 4000 Gms to 4500 Gms, 60-90% women were successful at having VBAC. Rupture increased only in those with a previous CS but without previous a VD¹⁰. The moot question is as to whether the head will pass through the pelvis and whether the scar will stand the strain labor or not ?

Twin gestation

A cautious approach is advised when considering planned VBAC in women with twin gestation, fetal macrosomia and short interdelivery interval, as there is uncertainty in the safety and efficacy of planned VBAC in such situations.

Rates of successful VBAC and uterine rupture did not differ significantly in studies concerning twin study groups and women with a singleton pregnancy attempting VBAC¹⁰.

Cesarean delivery on maternal request (CDMR)

No systematic, well-designed data exist on CDMR. However the rate of primary cesareans is increasing and studies using hospital discharge data or birth certificate data estimate that from 3% to 7% of all deliveries and women without prior cesareans have no reported medical or obstetric indications for their primary cesarean deliveries.

Until more information is gathered about CDMRs and until practice standards and guidelines are implemented, an explicitly executed informed consent should form the framework for any decision regarding the mode of delivery. Risk of still births (SB) is increased in women previously having CS. Cefalo comments "women planning a patient choice cesarean delivery should be advised of the possibility of an unexplained SB in a future pregnancy"^{37,38}.

Cesarean delivery on maternal request: maternal and neonatal complications

CD still account of 10% of all maternal deaths. A complicated but relevant and timely cesarean delivery on maternal request (CDMR) is defined as a cesarean delivery for a singleton pregnancy on maternal request term in the absence of medical or obstetrical indications³⁹. Harer opines that we should tell patients the facts and let them make the choice. He further says "Those who care for patients must consider factors beyond the mechanics of delivering their babies"⁴⁰.

The most recent national statistics estimates that in 2006, over 30% or 1.3 million births were via cesarean, a national record, and an estimated 2.5% of all births in United States were CDMR⁴¹. CDMR may be responsible for the highest CS rate of 29%. CDMR is low in Spain, France and Netherlands and high in Sweden, Italy,

Luxemburg, Germany and UK^{3,42}. Interestingly a survey revealed that male physician respondents were significantly more likely than females to agree to perform cesarean delivery and respondents were more likely to agree with a request from a high socio economical strata³⁹.

Conclusions drawn from the 2006 NIH State of the Science conference and 2007 American College of Obstetricians and Gynecologists Committee Opinion on CDMR²² are

If the physician believes that cesarean delivery promotes the overall health and welfare of the woman and her fetus more than vaginal birth, he or she is justified in performing a cesarean delivery. However, available evidence is that normal vaginal delivery is safer in the short and long term for both mother and child.

ACOG Committee opines further

1. Cesarean delivery on maternal request should not be performed before gestational age of 39 weeks has been accurately determined and there is documentation of lung maturity.
2. Cesarean delivery on maternal request should not be motivated by the unavailability of effective pain management.
3. Cesarean delivery on maternal request is not recommended for women desiring several children, given that the risk of placenta previa, placenta accreta, and gravid hysterectomy increase with each cesarean delivery.

In contrast, the International Federation of Gynecology and Obstetrics (FIGO) states⁴³. At present, because hard evidence of net benefit does not exist, performing cesarean section for non-medical reasons is not ethically justified.

Future obstetrics after preview cesarean section

1. Recurrent cesarean section : After history of a previous cesarean a woman starts her next pregnancy with almost 50% chance of repeat CD and after two CD in past, chance of repeat CS is 100% in most cases.
2. MTP : Routinely, the scarred area suction curettage does not get affected, however trauma is likely with regular curettage.

3. Placenta

a. Placenta Accreta

Repeat cesarean deliveries are associated with significantly higher maternal and neonatal morbidity and mortality compared with cesarean or vaginal deliveries for women who did not have a prior cesarean²⁰. For example, in one study, the odds ratios of having a life-threatening placenta accrete were 2.4 (1.3-4.3) for a third cesarean and 9.0 (4.8 – 16.7) for a fourth cesarean compared with a primary cesarean. Two or more CS with anterior or central placenta praevia has nearly 40% risk of placenta accreta. Incidence of placenta accrete has increased 10 fold in last 50 years it is at present 1/2500 deliveries^{10,44-46}.

Zaki et al reported 60% rate of placenta accrete with 3 or more cesarean deliveries⁴⁷. Prenatal Ultrasonography, MRI and color Doppler are useful to define an abnormally implanted placenta. Therefore, it is necessary to counsel such patients about possible blood transfusions being required the choice of blood products being required and possible hysterectomy. In 27000 attempted trial of scar after CS in past, for VBAC there were 3 maternal deaths.

- b) First birth cesarean section had a 30% increased risk for placental abruption is subsequent pregnancy.
- c) Multiple CS also carries risk of placenta previa.
4. Tubal ligation or sterilization performed at cesarean section has a greater failure rate as compared to non gravida.
5. Maternal and fetal deaths : In UK two fold increase in maternal mortality with CS whereas four fold increased rate associated with cesarean as noted by Harper^{30,39}.

Future gynecological possibilities after previous cesarean section

1. Infertility : Women with cesarean in past are marginally less likely to conceive when compared with vaginal delivery.
2. Women with history of CS in past are found more likely to have an ectopic pregnancy including in CS scar³⁰.
3. Cesarean section uterine scar is known to be a site for endometriosis.

The abdominal wall scar may get involved in some cases.

4. Adhesions: Like aftermath of any surgery, CS can result in mild to severe adhesions causing lower abdominal pain, dysmenorrhea, menorrhagia and future surgical difficulties including a high chance of trauma to bladder and adherent structure. Adhesion(s) can be the cause of unexplained pain in abdomen.
5. Repeat cesarean section(s) can increase the chance of uncommon dense adhesions between lower abdominal wall and uterocervical surface causing almost ventrofixation of the uterus which can be diagnosed clinically by the presence of 'cervico fundal sign and/or sonographic sign'^{48,49}.

Clinical sign

Speculum examination shows the cervix is inaccessible or barely visible on speculum examination with stretched and pulled up posterior vaginal wall. Traction on the cervix, with some difficulty, will not bring the cervix fully into view but pulls the lower abdominal wall inward. Unseen cervix is almost behind pubic symphysis under anaesthesia.

Sonographic sign

- 1) An elongated, pulled up cervix,
- 2) Easy to identify, a long cervix,
- 3) Even a full or overdistended bladder does not appear between the fundus of the uterus and anterior abdominal wall and
- 4) The uterus may tends to show retroflexion, forming an angle with the distended urinary bladder.
- 5) Anterior colporrhaphy: Bladder may or may not get reflected or separated swiftly and so extra care may be required.
- 6) Hysteroscopy plus D & C: No literature is available to negate hysteroscopy plus D & C because of scarred lower segment of the uterus. Therefore, past history of cesarean section is not a contra indication
- 7) Hysterectomy.

Often, a history of CS in past makes a gynecologist to not choose the vaginal route for a hysterectomy. In absence of any contraindication, woman needing hysterectomy, is therefore subjected to more invasive

abdominal or LAVH / LH, which may be easier for gynecologist but less desirable for the patient as compared to vaginal hysterectomy. Apprehensions that prevents a gynecologist from attempting a vaginal hysterectomy in these patients include the fear of bladder trauma and/or access to vesicouterine peritoneum.

Carpenter and Silva compared abdominal and vaginal hysterectomy cases after previous pelvic surgery and concluded that "vaginal hysterectomy following pelvic operation is technically easy and without increase in morbidity". Kovac recommends LAVH to access vesicouterine peritoneum and perform hysterectomy in such cases⁵⁰. Sizzi and Rossetti⁵¹ laparoscopic surgeons advocate that the best method is to access the vesico uterine peritomeum from lateral surgical window or utero-cervical broad ligament space. Bladder as a rule is adherent in the central three fifths with the lateral one fifth free. The same approach is utilized by laparoscopic surgeons at laparoscopic hysterectomy, and the same approach holds true at abdominal hysterectomy when bladder is adherent after previous cesarean section.

8. At laparoscopy : Insertion of veres needle and/or trocar requires extra care to avoid trauma.
9. Incisional hernia: Repair of incisional and/or umbilical hernia can concurrently be done with a vaginal hysterectomy. Only when subumbilical supra pubic incision for hernia repair extends close to pubic symphysis the gynecologist can choose to perform hysterectomy by laparotomy.

For a patient with one or more vertical abdominal incisions for cesarean section past opening the abdomen again to perform a hysterectomy markedly increased the patients chances of developing an incisional hernia. It is best is to perform hysterectomy via vaginal route, if not contraindicated. If contraindicated, an abdominal Pfannenstiel's incision can be used.

What can reduce repeat CS?

I Reduce primary CS

- II. ECV. Continuous efforts at external cephalic version to reduce breech presentation in singleton gestation has 35-86% success rate from 20 studies with average of 58% (ACOG). ECV is as successful in VBAC candidates as in women without CS in

past¹⁰. Randomized studies have shown significant decrease in CD rates^{52,53}.

- III. Reduce cases of post maturity CS by ultrasound to accurately date the pregnancy and inducing labor by sweeping the membranes¹⁹.
- IV. Most importantly the 'WILL' of the obstetrician plays a major role.

Conclusion

There is no iota of doubt that cesarean is of great value often a boon, when things awry. However, today's generation can get confused due to ACOG and RCOG recommendations and from art of obstetric practice to CDMR and finally in gynecological cases when hysterectomy for a woman with previous cesarean section is required. Comments from prestigious journals read: (1) Bowes with the trends noted, 'we can wonder if VBAC will become as rare as vaginal breech delivery, forceps rotations and episiotomies⁵⁴ and (2) 'I do not really know why VBAC is underutilized. I presume one reason is the blasé approach that is now taken to cesarean delivery, which probably results in many eligible women not even being informed of the option⁵³.

Let us instead scientifically and consider with help of RCOG and ACOG's recommendation: "Most women with one previous cesarean delivery with a low-transverse incision are candidates for VBAC and should be counseled about VBAC and offered a trial of labor"¹⁰. RCOG recommended that all women previously delivered by one lower segment CS should be offered an opportunity to labor during their next pregnancy by promoting a trial of scar or labor⁵⁵.

What applies to one country does not necessarily fit in with other countries needs. We must look at our maternal and perinatal mortality, numbers below the poverty line, GDP and not base our management on patterns followed by affluent countries with litigation fears constantly looming⁵⁶.

Practice in India shows that with a proper case selection, and close supervision, a trial of scar delivery eliminates the need for a large proportion of repeat cesarean operations.

An individualized approach seems to be the best⁵⁷. Chhabra⁵⁸ states that even in rural institutes with constraints, trial of labor and induction are safe in cases with history of CS in past. The key is election of women

for VBAC CS and induction of labor. 71% out of planned trials delivered vaginally.

How does one disprove or prove the need for surgery and justify the surgeon's performing cesarean section (CS)? If CS is not performed in a woman with history of previous cesarean, a rupture can seriously fault a decision to proceed with VBAC. Alternatively, if CS is performed, no one can prove that the outcome with VBAC would have been favourable.

It may not always that in a trial of labor it is a case of the fetus versus pelvis or a VBAC trial that it's the fetus versus the uterine scar, its is more so a trial of the attending obstetrician versus the science of obstetrics⁵⁶.

Leitch and Walker⁵⁹ related the rise in the cesarean rate to a change in medical practice and concluded that although indications for cesarean did not change much over time, "there has been a lowering in the overall threshold concerning the decision to carry out a cesarean section." This, combined with an increase in medically elective cesareans, has probably accounted for an increase in the cesarean rate over the past decade. Routine data on NHB Hospital births in England show that women living in the most affluent areas of England were significantly more likely to have an elective cesarean section than their less privileged counterpart⁶⁰.

Finally the question arises whether the obstetrician while deciding on a repeat cesarean considered that cesarean section once performed has a potential of resulting in an increase in obstetric hysterectomy due to conditions like placenta accreta, ventral scar hernia and adhesions between the lower abdominal wall with the uterus, the avoidance of vaginal route for hysterectomy by many⁵⁶ and other related problems. Thus an obstetrician needs to look at the risk, not only from the present cesarean section but risks emanating from it in future as well.

Man learns as he lives and experience is the greatest teacher in the world.

S. Vivekananda

References

1. Hamilton BE, Martin JA, Ventura SJ. Births: preliminary data for 2006. National vital statistics reports. Hyattsville (MD): National Center for Health Statistics; 2007.

2. Kilsztjan S, Carmo MS, Machando LC Jr, et al. Caesarean sections and maternal mortality in Sao Paulo. *Eur J Obstet Gynecol Reprod Biol* 2007; 132 (1): 64-9.
3. Habiba M, Kaminski M, Da Fre M, Marsal K, Bleker O, Librero J et al. Caesarean section on request: a comparison of obstetricians' attitudes in eight European countries. *BJOG* 2006;113:647-56.
4. Stanton C, Holtz S. Levels and trends in cesarean birth in the developing world. *Stud Fam Plann* 2006;37(1):41-8.
5. Unicef, WHO, UNFPA. Guidelines for monitoring the availability and use of obstetric services. Available at : <http://www.alianzaipss.org/reproductive-health/publications/unicef/index.html>. Accessed May 18, 2008.
6. Martin JA, Hamilton BE, Sutton PD, et al. Births: final data for 2005. National vital statistics reports, vol. 56 no.6. Hyattsville (MD): National Center for Health Statistics;2007.
7. Makoha FW, Fathuddien MA, Felimban HM. Choice of abdominal incision and risk of trauma to the urinary bladder and bowel in multiple cesarean sections. *Eur J Obstet Gynecol Reprod Biol.* 2006;125:50-3.
8. Cromi A, Ghezzi F, Di Naro E, Siesto G, Loverro G, Bolis P. Blunt Expansion of the Low Transverse Uterine Incision at Cesarean Delivery: A Randomized Comparison of Two Techniques. *Obstet and Gynecol Survey* 2009;64:4-5.
9. Doshi H, Tripathi J, Maheshwari S, Gupta A. Cesarean section 0 changing trends – a National Survey. *J Obstet Gynecol India* 2009;59:64:4-5.
10. ACOG. Vaginal birth after previous cesarean delivery. Compendium of selected publication. Washington DC (USA): The American College of Obstetricians and Gynecologists Women's Health Care Physicians, 2006; 1015-1023.
11. Lyell DJ, Caughey AB, Hu E Daniels K. peritoneal closure at primary cesarean delivery and adhesions. *Obstet Gynecol* 2005;275-80.
12. Komoto Y, Shimoya K, Shimizu T, Kimura T, Hayashi S, Temma-Asano K, Kanagawa T, Fukuda H, Murata Y. Prospective study of non-closure or closure of the peritoneum at cesarean delivery in 124 women. *Obstet Gynecol Survey* 2007;62: 11-12.
13. Tulandi T. Hum HS, gelfand MM. Closure of laparotomy incisions with or without peritoneal suturing and second look laparoscopy. *Am J Obstet Gynecol* 1988;158:536-7.
14. Bujold E, Bujold C, Hamilton EF et al. The impact of a single layer or double layer closure on uterine rupture. *Am J Obstet Gynecol* 2002;186:1326-30.
15. Stancy MP, Farley JH. Complications of gynecologic surgery. Dietrich CS, Martin RF (Eds): *Surgical Clinics of North America: Obstetrics and Gynecology for the General Surgeon*. Vol. 88 (2). Noida (India) Reed Elsevier India P. Ltd. 2008;343-59.
16. Dodd JM, Crowther CA, Huertas E, Guise JM, Horey D. Planned elective repeat cesarean section versus planned vaginal birth for women with a previous cesarean birth. *Cochrane Database Syst Rev* 2004;(4): CD004224.
17. Rageth JC, Juzi C, Grossenbacher H. Delivery after previous cesarean: A risk evaluation. Swiss Working Group of Obstetric and Gynecologic Institutions. *Obstet Gynecol* 1999;93:332-7.
18. Mozurkewich EL, Hutton EK. Elective repeat cesarean delivery versus trial of labour: A meta-analysis of the literature from 1989 to 1999. *Am J Obstet Gynecol* 2000;183:1187-97.
19. Vause S. Repeat cesarean section or induction of labour. Edited by Tim Hillard. *The Yearbook of Obstet Gynecol Part 1 Vol. 12*. RCOG Press 2008;320-330.
20. Lavender T, Hofmeyr GJ, Neilson JP, et al. Cesarean section for non-medical reasons at term (review). *Cochrane Database Syst Rev* 2006;3:CD004660.
21. NIH State-of-the Science Conference statement on cesarean delivery on maternal request. *NIH Consens State Sci statements.* 2006;23(1):1-29.
22. ACOG Committee opinion – Cesarean delivery on maternal request , *ACOG Compendium of 2009*;218-221.
23. Villar J, Valladares E, Wojdyla D, et al. Cesarean delivery rates and pregnancy outcomes: the 2005 WHO global survey on maternal and perinatal health in Latin America. *The Lancet.* June 2006;367:1819-1829.
24. Tita ATN, Landon MB, Spong CY, Lai Y et al. Timing of elective repeat cesarean delivery at term and neonatal outcomes. *New Eng J Med* 2009;360: 111-20.
25. Ramkrishnarao MA, Popat GU, Eknath BP, Panditrao SA. Intra-operative difficulties in repeat CS – A stud of 287 cases – *The J of Ob-Gyn of India* 2008;58:507-10.
26. Lurie S, Sadan O, Golan A. Re-laparotomy after cesarean section. *Eur J Obstet Gynecol Reprod Biol.* 2007;134:184-7.
27. Rossi AC; D'Addario V. Maternal morbidity following a trial of labor after cesarean section vs. elective repeat cesarean delivery: a systematic review with metaanalysis. *Am J Obstet Gynecol.* 2008 Sep;199 (3):224-31.
28. ACOG Committee opinion. Compendium of selected publication. Washington DC (USA): The American College of Obstetricians and Gynecologists Women's Health Care Physicians, 2006;111-21.
29. Durnwald CD, Ehrenberg HM, Mercer BM. The impact of maternal obesity and weight gain on original birth after cesarean section success. *Am J Ob-Gyn* 2004;191:954-57.

30. Mukherjee S N Rising cesarean section rate. *J Of Obstet Gynecol of India.* 2006;56:298-300.
31. Algovik M, Nilsson E, Cnattingius S, Lichtenstein P, Nordenskjold A, Westgren M. Genetic influent on dystocia. *Obstet Gynecol Survey* 2005;60:158-9.
32. Anonymous, Induction of labour. London: RCOG Clinical effectiveness support unit. 2001;1-78.
33. Agrawal V, Kulshresta S, Tomar S. Internal podalic version followed by breech extraction in previous 3 cesarean sections. *J Obstet Gynecol. Ind.* 2008;58:438-9.
34. Srinivas SK, Stamilio DM, Stevens EJ, Odibo AO, Peipert JF, Macones GA. Predicting failure of a vaginal birth attempt after cesarean delivery. *Obstet Gynecol* 2007;109:800-5.
35. Rashid M, Rashid RS. Higher order repeat cesarean sections: how safe are five or more? *BJOG* 2004;111:1090-4.
36. Turner MJ, Agnew G, Langan H. Uterine rupture and labour after a previous low transverse cesarean section. *BJOG* 2006;113:729-32.
37. Gordon CS, Pell JP, Dobbie R. Cesarean section and risk of unexplained stillbirth in subsequent pregnancy. *Obstet Gynecol Survey.* 2004;59:413-5.
38. Gray R, Quigley MA, Hockley C, Kurinczuk JJ, Goldacre M, Brocklehurst P. Cesarean delivery and risk of stillbirth in subsequent pregnancy: a retrospective cohort study in an English population. *BJOG* 2007;114:264-70.
39. Ghetti C, Chan BKS, Guise JM. Physician's responses to patient requested cesarean delivery. *Obstet Gynecol Survey* 2005;60:348-9.
40. Harer BW. A Guest editorial: Quo vadis- cesarean delivery; *Obstet Gynecol Survey* 2002;57:61-4.
41. Hamilton BE, Martin JA, Ventura SJ. Births; preliminary data for 2006. *Natl Vital Stat Rep* 2007;56:1-18.
42. National Institutes of Health state-of-the-science conference statement. Cesarean delivery on maternal request. March 27-29, 2006. *Obstet Gynecol* 2006;107:1386-97.
43. Issues in Obstetrics and Gynecology by The FIGO Committee for the Ethical Aspects of Human Reproduction And Women's Health. 41-2, (1998), 2003.
44. Silver RM, Landon MB, Rouse DJ, et al. Maternal morbidity associated with multiple repeat cesarean deliveries. *Obstet Gynecol* 2006;107:1226-32.
45. Miller DA, Chollet JA, Goodwin TM. Clinical risk factors for placenta previa-placenta accrete. *Am J Obstet Gynecol* 1997;177:210-4.
46. Kirkinen P, Helin-Martikainen HL, Vanninen R, Partanen K. Placental accreta: imaging by gray-scale and contrast-enhanced color Doppler sonography and magnetic resonance imaging. *J Clin Ultrasound* 1998;26:90-4.
47. Zaki Z, Bahar AM, Ali ME et al. Risk factors and morbidity in patients with placenta praevia accrete compared to placenta praevia non accrete. *Acta Obstet Gynecol Scand* 71998;77:391-4.
48. Sheth SS, Rao AR, Look for cervico fundal sign in women with previous cesarean. *J Obstet Gynecol of India* 2002;52:90-2.
49. Sheth SS, Shah NM, Varaiya D.A. sonographic and clinical sign to detect specific adhesions following cesarean section. *Journal of Gynecol Surgery.* 2008;24:27-35.
50. Sheth SS, An approach to Vesicouterine Peritoneum through a New Surgical Space. *J Gynecol Surg.* 1996;12:135-40.
51. Sizzi O, Rossett A. Overcoming technical limits to laparoscopic hysterectomy. *J of Gynecologic and Surgical Endoscopy* 2005.
52. ACOG: External cephalic version. Compendium of selected publication. Washington DC (USA): The American College of Obstetricians and Gynecologists Women's Health Care Physicians, 2006;128 & 500.
53. Wise MR, Sadler L, Ansells D. Successful but limited use of external cephalic version in Auckland. *Obstet Gynecol Survey* 2009;64:218-9.
54. Coleman VH, Erickson K, Schulkin J, Zinberg S, Sachs BP. Vaginal birth after cesarean delivery. *Obstet Gynecol Survey* 2005;60:636-7.
55. Pare E, Quinones J, Macones G. Vaginal birth after cesarean section versus elective repeat cesarean section: assessment of maternal downstream health outcomes. *BJOG* 2006;113:75-8.
56. Sheth SS, Editorial – "Concentrate on per via naturals: spare cesarean section and save the abdomen". *Expert Rev. Obstet Gynecol.* 2006;1:3-5.
57. Shah JM, Mehta MN. Analysis of mode of delivery in women with previous one cesarean section. *J Obstet Gynecol of India.* 2009;59:136-9.
58. Chhabra S, Arora G. Delivery in women with previous cesarean section. *J Obstet Gynecol of India.* 2006;56:304-7.
59. Leitch CR, Walker JJ. The rise in cesarean section rate: the same indications but a lower threshold. *Br J Obstet Gynaecol* 1998;105:621-6.
60. Alves B, Shikh A. Investigating the relationship between affluence and elective cesarean section *BJOG* 2005;112:994-6.