Should we encourage repeated cesarean section or VBAC

台北長庚婦產科
劉瑞德 主任

The risk of lowering the cesarean-delivery rate January 7, 1999, NEJM

- The rate of cesarean section in 1995—21%
- The goal of health people 2000—reduce the rate to 15%
  - Lead to high cost and more complication
  - Because of increasing VBAC and usage of operative vaginal delivery

Cesarean section

- Main indication
  - Prior C/S (35%)
  - Dystocia of CPD (30%)
  - Breech presentation (12%)
  - Nonreassuring cesarean delivery (9%)
- 1970-1995, C/S rate from 5% to 21%
- In 1995, Primary C/S rate : 15%
- 1991-1995, VABC rate from 21% to 28%

Why the C/S rate increase??

- Lower tolerance for taking risk
- Fear of malpractice litigation
- Increased use of epidural anesthesia
- Increased use of electronic fetal monitor detection of fetal hyposia or acidosis
- Convenience of physician
- Parents expectation of a perfect baby
- Women's previous experience of difficult labor
- Epidural anesthesia increase dystocia
- Increased reimbursement

Risk associated with cesarean delivery

- Maternal risk is 3-7 times associated with vaginal delivery
- Overall mortality rate from cesarean section alone is 6 per 100000
- Intraoperatively, uterine hemorrhage may develop from atony, extension of the incision, uterine rupture, the presence of leiomyoma, placenta accreta

- Involvement of adjacent structure
  - Urinary tract injury
    - cystotomy
    - Ureteral injury
  - GI tract: rare, 1/1300 cesarean deliveries
    - Previous infection or surgery, which may cause intraperitoneal adhesions, increase the risk of enterotomy

Risk from prior cesarean section

- 2.4% with pre-C/S had extremely serious complication
  - Uterine rupture
  - placenta previa or accreta
  - Materanal or fetal death
- Leading cause of maternal mortality
  - Deep vein thrombosis
  - Pulmonary embolism

Postoperative sequela

- Infection
- Endomyometritis incidence rate
  - With C/S: 10-50%
  - With vaginal delivery:1-3%
  - Risk factor:
    - length of labor and ROM
    - the number of vaginal examination
    - Use of intermal monitor
    - Patient's socioeconomic status
    - Presence of chorioamnionitis
    - Duration of the surgical procedure

- Maternal factor for infection
  - Obesity
  - DM
- Other sequela
  - Wound and urinary tract infection
  - Ileus
  - atelectasis

Previous cesarean delivery and placenta previa

- Frequency is 0.3%
- Pre C/S women had 2.6 times more likely to develop placenta previa in a subsequent pregnancy
- Placenta accreta
  - Without previous uterine scar:4.5%
  - With previous uterine scar:24-38%

Neonatal risk

- Mortality rate of infants delivered by CS

In 1997 was 10.1 per 1000 deliveries

  - Partly accounted for by risk factors than led to the cesarean birth
  - Inappropriate timing of delivery
- Elective surgical delivery without labor
  - Transient tachypnea of newborn
  - Respiratory distress syndrome
- 0.4% expreienced accidental laceration

Can VBAC reduce the CS rate??

- 1997, 37% CS in the united states were repeat cesarean deliveries
- 27.4% women with preC/S had successful VBAC
- Publisher series indicate than 60-80% of VBAC candidates undergoing a trial of labor will deliver vaginally
- Women who have undergone vaginal delivery at least once have a higher VBAC rate than women with prior cesarean birth who have not delivered vaginally

- Women who had a cesarean delivery for a nonrecurring indication (eg,breech)for their first delivery are more likely to have a successful vaginal delivery
- Successful VBAC is associated with less morbidity than a repeat cesarean birth
- Patient who undergo cesarean delivery after a trial of labor run a higher risk of infection and other maternal morbidity
- Cohort studies: no differences in perinatal morbidity and mortality among infants of women who attempted a trial of labor after preCS compared with women who opted for repeatCS

VBAC

- Major risk is uterine rupture –0.2- 1.5%
  - Substantial hemorrhage
  - Increase hysterectomy
  - Fetal hypoxia injury

RISK OF UTERINE RUPTURE DURING LABOR AMONG WOMENWITH A PRIOR CESAREAN DELIVERY

MONA LYDON-ROCHELLE, PH.D. N Engl J Med, Vol. 345, No. 1July 5, 2001

- 1.6 per1000 among women with repeated cesarean delivery without labor
- 5.2 per 1000 among women with spontaneous onset of labor
- 7.7 per1000 among women whose labor was induced without prostaglandins
- 24.5 per 1000 among women with prostaglandin-induced labor

TABLE 3. INCIDENCE AND RELATIVE RISK OF UTERINE RUPTURE DURING A SECOND DELIVERY AMONG WOMEN WITH A PRIOR CESAREAN DELIVERY.*

TYPE OF DELIVERY	NO. OF WOMEN	INCIDENCE (PER 1000)	RELATIVE RISK (95% CONFIDENCE INTERVAL)
Repeated cesarean delivery without labor	6,980	1.6	1.0
Spontaneous onset of labor	10,789	5.2	3.3 (1.8–6.0)
Induction of labor without prostaglandins	1,960	7.7	4.9 (2.4–9.7)
Induction of labor with prostaglandins	366	24.5	15.6 (8.1–30.0)

*Incidence is expressed as the number of cases of uterine rupture per 1000 women who delivered a second singleton infant after a prior cesarean delivery. Women who had repeated cesarean delivery without labor served as the reference group.

TABLE 4. POSTPARTUM COMPLICATIONS OF SECOND DELIVERIES AMONG WOMEN WITH A PRIOR CESAREAN DELIVERY.*

POSTPARTUM COMPLICATION	NO UTERINE RUPTURE (N=20,004)	UTERINE RUPTURE (N=91)
	number (percent)	
Severe posthemorrhagic anemia	958 (4.8)	10 (11.0)†
Major puerperal infection	243 (1.2)	8 (8.8)
Bladder injury	235 (1.2)	7 (7.7)
Paralytic ileus	78 (0.4)	3 (3.3)
Hysterectomy	12 (0.1)	4 (4.4)
Surgical complication‡	142 (0.7)	32 (35.2)
Maternal hospital stay >5 days	842 (4.2)	24 (26.4)
Death of infant	100 (0.5)	5 (5.5)

*P=0.001 for the difference between the groups, except as noted.

†P=0.006.

‡Complications of anesthesia and obstetrical surgery are included.

- ***Conclusions***
  - For women with one prior cesarean delivery, the risk of uterine rupture is higher among those whose labor is induced than among those with repeated cesarean delivery without labor
  - Labor induced with a prostaglandin confers the highest risk.

Uterine rupture

- Life-threatening for both mother and infant
  - Required hysterectomy
  - Infants will die or be neurologically impaired
  - Poor outcomes can result even in appropriate candidates with proper management
- Uterine rupture dose occur, generally outcome is good for mother and infant
  - Immediate performing CS

ACOG VBAC recommendations

- Most women with one previous CS with a low transverse incision are candidates for VBAC
- Previous uterine incision extending into the fundus is a contraindication for VBAC
- Uterine rupture may be catastrophic, VBAC should be attempted in institutions equipped to respond to emergencies with physicians immediately available to provide emergency care

How to do decision making

- Pregnant women play an important role in making the decision as to whether they should attempt VBAC
  - 30-50 % of them choose elective repeat CS
    - Fear of failed trial of labor
    - Concerns about the dangers of vaginal birth
    - Fear of pain
    - Desire for sterilization
    - Convenience in scheduling
- Higher VBAC rates among younger practitioners and patients with a lower level of education

How to increase VBAC rate

- Educated by the opinion leaders
- VBAC program can be a safe and important component of hospital-based programs to reduce cesarean section

Reduction of CS rate

- Reduction in the total CS rate would require a reduction in the primary cesarean delivery rate
- VBAC can be an important component of programs to reduce cesarean delivery rates in patients with term singleton fetuses with vertex presentation

Operative vaginal delivery

- Forceps deliveries and vacuum-assisted vaginal deliveries are thought by many experts to be an essential component of the future of obstetrics
- May associated with fetal or maternal trauma
  - the incidence of significant morbidity is small when these devices are used appropriately

- The lower the fetal head or the less rotation required, the less risk of injury to the mother and child
- Clinical trial failed to document an increased risk of long-term morbidity relative to those of alternative delivery routes
- Failed operative vaginal delivery with subsequent cesarean delivery to cesarean section during the second stage of labor with no antecedent attempt at operative vaginal delivery also showed no difference in short term neonatal or maternal morbidiry

Vacuum and Forcep

- Forcep--- facial marks and facial nerve palsy
- Vacuum---cephalohematoma
- Vacuum often is substituted for forcep

- Fewer precticing obstetricians indlude obstetric forceps as part of their clinical equipment
  - Most Fellows no longer attempt operative vaginal deliery in the management of deep transverse arrest
  - Mort training programs no longer teach midpelvic forceps delivery
  - Instead preferring vacuum delivery

- As the number of forceps deliveries and vacuum deliveries decreases, the number of cesarean deliveries will increase
  - This trend with a declining operative vaginal delivery rate might be reversed
  - Hospital with a high cesarean delivery rate should consider introducing training during and after residency in the appropriated use of forceps and the vacuum in the management of second stage arrest

Patient choice cesarean

- At the dawn of this century: desperate operation to save a women's life
- At mid-century: low-risk procedure
- At century ends:life enhancing operation
  - Advances of anesthesia, asepsis, neonatal carea and surgical techniques
- Perhaps in the future: risks, benefits and costs are so balanced between cesarean and vaginal delivery

→ only deciding factor is mother's preference

The quality of life

- With the increasing longevity of women, the preservation of sexual function and quality of life have more importance the ever before
  - Obestetricians routinely counsel patients regarding the risk of uterine rupture in a future pregnancy
  - Do they also counsel women regarding later sexual dysfunction, pelvic organ prolapse, urinary or fecal incontinence or any other risk associated with vaginal birth
  - Wound more women request CS

Urinary and anal incontinence

- 3 months post partum, fecal incontinence was found in 3%
  - episiotomy and sphincter damage
- Involuntary loss of flatus was reported by 25%
  - Maternal age, macrosomia and use of forcep
- Urinary incontinence increased by 10%
- CS was protective against these risk

- No one knows what the best cesarean rate should be
- Obstetricians are obligated to recommend cesarean delivery in any given case

Patient-centered care

- Deliberative model in which the patient's perspective is incorporated when determining the choice of therapy is considered the optimal
- Autonomy requires that individuals critically asses their own values and preferences
- The role of the physician is clearly one of informing the patient

ACOG Committee on Ethics states

- the role of the obstetrician should be one of an informed educator and counselor
- The obstetrician should refrain from performing procedures that are unwanted by a pregnant woman
- Even in cases of perceived conflict of maternal and fetal interests, the pregnant woman's autonomy should be respected

- Traditional paternalistic medicine held that therapeutic choice is dictated by the ‘’doctor knows best’’ theory
- The time is coming---maternal-choice cesarean.
- Health Care Financing Administration --- requires hospitals to give patients the right to participate in the development and implementation of their plan of care and to request or refuse treatment

Thanks for your attention!!

Rise in “no indicated risk” primary caesareans in the United States, 1991-2001: cross sectional analysis

- No indicated risk
  - mothers with singleton
  - full term (>= 37 weeks)
  - vertex presentation births
  - not reported to have any medical risk factors
  - no complications of labour or delivery

Age (years) and parity	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Percentage change between 1991 and 2001
All ages and parities	46.3	45.5	45.2	44.6	44.4	43.5	42.6	42.1	42.1	41.9	41.8	−10
Primary caesarean rates: all parities												
All ages	3.3	3.3	3.4	3.4	3.6	3.7	3.9	4.1	4.4	4.9	5.5	67
<20	3.0	3.1	3.1	3.2	3.3	3.3	3.5	3.7	4.0	4.5	5.1	70
20-24	3.0	3.0	3.0	3.1	3.1	3.2	3.4	3.4	3.8	4.2	4.7	57
25-29	3.3	3.3	3.3	3.3	3.4	3.5	3.7	3.9	4.2	4.8	5.1	55
30-34	3.5	3.4	3.5	3.6	3.8	3.9	4.2	4.4	4.8	5.3	5.9	69
35-39	4.3	4.5	4.6	4.6	4.8	4.9	5.3	5.6	5.9	6.6	7.4	72
≥40‡	6.1	6.2	6.5	6.8	7.0	6.8	7.4	7.9	8.2	9.7	10.2	67
Primiparous women												
All ages	5.6	5.7	5.6	5.7	5.8	6.1	6.3	6.7	7.1	8.0	8.9	59
<20	3.6	3.7	3.6	3.7	3.8	3.9	4.0	4.3	4.6	5.2	5.9	64
20-24	4.9	5.0	4.9	4.9	5.0	5.3	5.5	5.6	6.1	6.8	7.7	57
25-29	6.3	6.4	6.3	6.3	6.3	6.7	6.8	7.4	7.7	8.9	9.6	52
30-34	8.6	8.2	8.2	8.4	8.7	8.9	9.3	9.6	10.4	11.2	12.3	43
35-39	12.4	13.4	13.2	13.1	13.4	13.4	13.5	14.6	15.6	16.8	18.5	49
≥40‡	18.2	17.6	19.5	18.3	19.7	18.2	19.7	21.1	21.9	25.1	25.7	41
Multiparous women												
All ages	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.6	2.8	3.2	3.5	67
<20	1.7	1.7	1.8	1.8	1.9	1.9	1.9	2.1	2.3	2.5	2.8	65
20-24	1.7	1.7	1.8	1.8	1.7	1.8	1.9	2.0	2.2	2.4	2.7	59
25-29	1.9	2.0	1.9	2.0	2.0	2.1	2.2	2.3	2.6	2.9	3.0	58
30-34	2.3	2.2	2.3	2.2	2.4	2.5	2.6	2.8	3.1	3.4	3.8	65
35-39	3.0	3.0	3.1	3.0	3.2	3.3	3.6	3.8	3.9	4.5	5.1	70
≥40‡	4.5	4.7	4.6	5.1	4.9	5.0	5.4	5.7	5.9	7.0	7.5	67

Source: Natality Data Sets, 1991-2001. National Center for Health Statistics.
*Proportion of women with full term, vertex, singletons with birth weight <4000 g with no reported medical risk factors or complications of labour and delivery.
†Number of primary caesareans per 100 live births to women who have not had a previous caesarean.
‡Beginning in 1997, data are for women aged 40-54 years.

- proportion of mothers at no indicated risk decreased from 46% of all births in 1991 to 42% in 1998
- almost one fifth (19.5%) of primiparous mothers aged over 34 had such a delivery in 2001.
- More than 5% of multiparous mothers over 34 who had had previous vaginal births also had a no indicated risk primary caesarean in 2001.
- Among mothers under 30 with no indicated risk, the primary caesarean rate grew by more than half (58%) between 1991 and 2001 to 4.9%.

- In 2001, 80 028 no indicated risk primary caesareans took place in the United States
- an increase of 25 162 since 1996.
- This represented 25.8% of the total increase (97 659) in primary caesareans between 1996 and 2001.
- Age was a major factor, particularly among first time mothers
  - For primiparous mothers aged over 40, the odds of having a caesarean were 5.4 times that for mothers aged 20-24

- ”defensive medicine” would encourage the reporting of a risk factor associated with the resulting caesarean
- health problems associated with caesareans have been amply documented
- All of these risks may be easily outweighed by the potential benefits to a mother or infant with a condition that could have been avoided by a timely caesarean

What if the caesarean was done without a medical indication ??

- additional research is needed to elucidate whether the risks of a no indicated risk primary caesarean will be offset by associated benefits

VBAC- is the risk acceptable

- 40 years ago, Douglas documented the risk of uterine rupture during a trial of labor after CS
  - Once a cesarean, always a cesarean
- Increase of CS rate in 1980s contributed to revive the practice of VBAC
- 5-10 % risk of uterine rupture was associated with use of misoprostol
- ACOG warned against the use of misoprostol for this purpose

- Relative risk of 3.3 for uterine rupture in women with a spontaneous onset of labor, as compared with those who underwent elective repeated cesarean section
- Significant increase in the risk of fetal death and an Apgar score of less than 7 at five minutes

Why might a women choose a trial of labor

- Less postpartum discomfort
- Shorter hospital stays
- Shorter periods of disability
- lower risk of fever
- Avoid morbidity related to multiple abdominal surgeries, placenta accreta and uterine rupture if plan future pregnancy

Judge of risk

- Experts: according to technical estimated of numbers of deaths
  - 5.8 per 1000 with trials of labor after CS
  - 3.4 per 1000 with elective repeated CS
- Patient: according to the degree to which they dread the unwanted outcome
  - Perinatal death would probably be associated with a high degree of dread

- The process of obtaining informed consent for medical care requires that physicians provide patients with the information
- Most reasonable women considering VBAC want to know
  - VBAC had tripling of the risk of uterine rupture
  - Induction of labor with prostaglandin is associated with an increased risk
- Some reasonable women may conclude the absolute risks are so small that they are worth taking and are outweighted by the genefits of VBAC

- These issue should be discussed with each patient, and she must make than decision by herself
- The patient may ask: But doctor, what is the safest thing for my baby

  → Author's answer is

Elective repeated cesarean section