

# **VAGINAL BIRTH AFTER CESAREAN SECTION: A RETROSPECTIVE AND PROSPECTIVE STUDY**

Thesis

Submitted for Partial Fulfillment of  
Master degree in Obstetrics & Gynecology

Presented by

**Khaled Mohamed Abdel-Aziz**

M.B.B.Ch.

Resident of obstetrics & gynecology  
Misr University for Science and Technology

Supervised by

**Prof. Aly Elyan Khalaf Allah**

Professor of Obstetrics & Gynecology  
Ain Shams University

**Prof. Sherief Fikry Hendawy**

Professor of Obstetrics & Gynecology  
Ain Shams University

**Dr. Ahmed Mohammed Bahaa El-Din**

Lecturer of Obstetrics & Gynecology  
Ain Shams University

Faculty of Medicine  
Ain Shams University

٢٠١٢

## INTRODUCTION

The first modern Caesarean section was performed by German gynecologist Ferdinand Adolf Kehrer in 1881 (*Finger, 2003*).

It is usually performed when a vaginal delivery would put the baby's and/or mother's life or health at risk, although in recent times it has been also performed upon request for childbirths that could otherwise have been natural (*Finger, 2003*).

The rate of cesarean delivery in the United States was first measured in 1960, it was 4.0 % (*Bonnano et al., 2011*).

It peaked to 24.7% in 1988 (*Taffel et al., 1991*), Contributing factors to the increase in abdominal delivery include electronic fetal heart monitoring (*Thacker et al., 1990*), a change in philosophy toward breech presentation and the use of forceps (*Bottoms et al., 1980*), Physician practice styles (*Goyert et al., 1989*), and the medicolegal climate (*Stafford et al., 1990*).

The National United States CS rate was 22.9% in 2000 (*ACOG, 2000*). A Task Force on Cesarean Delivery Rates convened by the American College of Obstetricians and Gynecologists has suggested that a national goal should be to achieve a VBAC rate of 37%, which was the 50<sup>th</sup> percentile for 1996 (*Task Force on Cesarean Delivery Rates by ACOG, 2000*). However, the women with a previous cesarean in 1996 to 2007 in

2000, a drop of 27%, and repeat CSs now account for 30% of all CSs (*Menacker and Curtin, 2001*).

The phrase “once a cesarean always a cesarean” was coined by Edward B. Cragin in 1916 who was referring to a very small proportion of pregnant women who were unable to deliver vaginally after several days in active labor and required cesarean delivery as a life-saving procedure. Despite the perils of surgery in that era, these women were not believed to be candidates for vaginal delivery in the future (*Bonnano et al., 2011*).

In 1981, a National Institutes of Health (NIH) Consensus Development Conference Panel on Cesarean Childbirth addressed this issue and recommended that more women who had undergone a previous cesarean delivery be offered a trial of labor (*National Institutes of Health Consensus, 1981*).

The American College of Obstetricians and Gynecologists (ACOG) also concluded that carefully selected patients should be allowed a trial of labor after cesarean in its first publication on VBAC (*ACOG, 1985*).

Enthusiasm for vaginal birth after cesarean section has waned. As a result, the cesarean birth rate is again on the rise. As a medical community and society we must decide whether the most appropriate question is “What is safest for my baby” or “Is the risk associated with vaginal birth after cesarean acceptable?” There are risks associated with vaginal birth after

cesarean, but in a hospital setting with appropriate resources these risks are low and would still seem to be acceptable (*Socol, 2003*).

Vaginal birth after a prior low transverse cesarean section (VBAC) is considered a safe and effective alternative to elective repeat cesarean delivery if the obstetric indications for the prior cesarean delivery and/or new indications are not present (*ACOG, 2010*), furthermore updated recommendations for VBAC and TOLAC were adopted.

Tackling the topics of cesarean surgery and vaginal birth after cesarean (VBAC) is an increasing challenge for the birth professional even though scientific evidence clearly supports reducing the skyrocketing cesarean rate and increasing the support for and availability of VBACs for childbearing women (*Andrews and Humphries, 2010*).

For women with incisions that extend into the contractile portion of the uterus, the risk may be as high as 4% to 9%. Uterine rupture is a potentially catastrophic outcome, and warrants appropriate attention (*ACOG, 2010*).

It also has been associated with an increased risk of neonatal compromise, blood transfusion, and hysterectomy. However, the absolute risk is low after one prior cesarean and is also lower than initially estimated for women with a history of 2 or more cesarean deliveries (*McMahon et al., 1997*).

A case of simultaneous uterine and urinary bladder rupture in an otherwise successful vaginal birth after cesarean delivery was reported by *Ho et al.* (१००). They believe that uterine rupture is the primary concern when a patient chooses a trial of labor after a cesarean section. Bladder rupture accompanied by uterine rupture should be taken into consideration if gross hematuria occurs.

The appropriate use and safety of cesarean and VBAC are of concern not only at the individual patient and clinician level but they also have far-reaching public health and policy implications at the national level (*Cheng et al.*, १०१).

Although VBAC is a reasonable and safe option for most women with prior cesarean delivery, careful consideration of risks, benefits and assessment of individual factors is vital in this decision-making process (*Cheng et al.*, १०१).

## **AIM OF THE WORK**

The aim of this work is to determine the success of vaginal birth after cesarean section (VBAC) in Ain Shams Maternity Hospital and to determine factors contributing to this success.

## HISTORY OF CESAREAN SECTION

**C**esarean Section, Is a surgical procedure in which incisions are made through a mother's abdomen (laparotomy) and uterus (hysterotomy) to deliver one or more babies. It is usually performed when a vaginal delivery would put the baby's and/or mother's life or health at risk, although in recent times it has been also performed upon request for childbirths that could otherwise have been natural (*Finger, ۲۰۰۳*).

### Historical Background

The origin of the word cesarean is unclear. J.H Young in his monograph of "The history of cesarean section" published in ۱۹۴۴ reached a conclusion that "it is quite impossible to ascertain exactly when the operation of cesarean section was first performed, whether on a living women or postmortem. There is no doubt however, that the history of cesarean section is of great antiquity. Though the earliest medical writers are silent on the subject of cesarean section, yet unmistakable references are made to it in ancient rabbinical writings such as the mischnagoth (۱۴۰ B.C.) and the Talmud, compiled between the second and sixth centuries AD. If cesarean section was actually employed, it is particularly surprising that Soranus, who's extensive work written in the second century AD. covered all aspects of obstetrics, did not refer to cesarean section (*Cunningham et al., ۲۰۰۱*).

The weak myth that Julius Caesar was born by this route is contradicted by the fact that his mother survived his birth by many years. It is likely that the term comes from the Lex Regia or royal law legislated by one of the early kings of Rome, Numa Pompilius in 715 BC. This law proclaimed that women who died before delivering their infants had to have the infant removed through the abdomen before burial. Later in the time of the Cesars, this law was called lex Caesarea, and this is the most probable derivation of its present name (*Fasbender et al.*, 1997).

A linguistic explanation states that the word cesarean was derived sometime in the Middle Ages from the Latin verb Caedera "To Cut". An obvious cognate is the word caesura, a cutting, or pause, in a line of verse. This explanation of the term cesarean seems most logical, but exactly when it was first applied to the operation is uncertain. Because "section" is derived from the Latin verb seco, which also means "cut" the term cesarean section seems tautological (*Cunningham et al.*, 2001).

Cesarean section on the living was first recommended, and the current name of the operation used, in the collaborated work of Francois Rousset (1781) entitled "Traite Nouveau de l'hystrotomotokie ou l'enfantement cesarien" Rousset had never performed or witnessed the operation; his information was based chiefly on letters from friends. He reported 14 successful cesarean sections, a fact itself difficult to accept. When it is further stated that 6 of the 14 operations were performed on the

---



same woman, the credulity of the most gullible is exhausted (*Cunningham et al.*, 2001). However, it was not until the pioneering work of Morton in the use of diethyl ether for operative anesthesia in 1846 and the introduction of carbolic acid antiseptics of Lister some 20 years later that cesarean delivery could begin to be approached in a uniform manner as a potential option for childbirth (*Sewell et al.*, 1997).

The first witnessed and documented cesarean section by a physician was performed by Jeremias Trautman in Wittenberg, Germany in 1610. However a number of obstetric texts in the 16<sup>th</sup> and 17<sup>th</sup> centuries described the rare performance of cesarean section in cases of contracted pelvis. From the 16<sup>th</sup> to the 18<sup>th</sup> centuries the prevailing medical wisdom was strongly against cesarean section, with its almost inevitable fatal outcome for the mother (*Young et al.*, 1994).

The first successful cesarean delivery in the British Empire was performed between 1810 and 1821 (*Miller et al.*, 1994).

The first major surgical advance in the technique of cesarean section was introduced in (1876) by Porro (*Miller et al.*, 1994). Influenced by the prevailing concept of non-suturing of uterine incisions, Porro introduced a technique in which the uterine fundus was amputated following hysterotomy and the stump marsupialized to the anterior abdominal wall. Although drastic by today's standard, the Porro technique resulted in a dramatic decline in maternal mortality associated with this operative abdominal delivery (*Speert et al.*, 1908).

---

The introduction of uterine sutures by Max Sanger in 1882, reduced the mortality rate of the operation from hemorrhage, generalized peritonitis remained the dominant cause of death; hence, various types of operations were derived to combat this scourge (*Cunningham et al., 2001*).

Nevertheless, Porro operation remained popular for many years and in one series from the Eastern United States in 1992, 20% of cesarean sections were performed as Porro cesarean hysterectomies (*Harris et al., 1992*).

**Frank Polin** (1879) was the first American physician credited with the use of sutures to close the uterus after cesarean delivery, he used silver wire sutures.

The next major development in cesarean section was Frank's description in 1907 of extraperitoneal cesarean section (*Frank et al., 1907*). Frank opened the peritoneal cavity first above the pubis and then sutured the parietal peritoneum to the visceral peritoneum at the point of the vesicouterine reflection. This sealed off the peritoneal cavity before opening the uterus through a vertical incision.

Two years later Latzko reported a major modification of the procedure, which avoided entry into peritoneal cavity. The extraperitoneal operation was designed to prevent the peritoneal contamination that occurred once the uterus was opened (*Latzko et al., 1909*).

In 1912 Kronig used a transperitoneal approach, dissected the bladder away from the lower uterine segment, and entered the uterus through a short vertical incision (*Speert et al., 1912*).

In the early 1920's Beck, De Lee and Comell popularized the vertical lower segment operation in the United States (*Beck et al., 1921*).

It was Munro Kerr who would be largely responsible for the large change from the classical incision to the low transverse incision. When Kerr performed his downward curving transverse incision on the lower uterine segment (*Kerr, 1926*), it was to reduce and contain the risk of sepsis. This was modified by *Pfaneuf (1931)* into the present day, upward curving low transverse uterine incision (*Cunningham et al., 2001*).

The Kerr's procedure now is the most popular type of cesarean section (*O'Sullivan et al., 1981*).

### **Types of cesarean section:**

Based on the timing of C.S at the time of decision making, the types of C.S are grouped under one of four:

- **Emergency C.S:** ideally the C.S should be done within the next 30 minutes. Some examples are: abruption, cord prolapse, scar rupture, scalp pH < 7.2 and prolonged FHR deceleration < 80 bpm. (*Keith et al., 2007; Klemetti et al., 2010*).

- **Urgent C.S:** the delivery should be completed within 60-90 minutes and cases with FHR abnormalities are those of concern (*Keith et al., 2004*).
- **Scheduled C.S:** continuation of pregnancy is likely to affect the mother or fetus in hours or days. Some plan should be in place to deliver before further deterioration occurs. It may be a case of failure to progress where the C.S is planned within next hour or two or it may be a case of growth-restricted fetus in the preterm period with absent end diastolic flow but a normal CTG or a case with preeclampsia where the liver or renal function tests are gradually deteriorating where the C.S is planned for within hours to days (*Keith et al., 2004*).
- **Elective C.S:** the main principle being to carry out C.S as late as possible in gestation without compromising the maternal or fetal health. It is generally done around 39 weeks as the incidence of tachypnea of the newborn is much less after this gestation. (*Keith et al., 2004*).

### **Prediction of cephalopelvic disproportion**

- **Floating head / unengaged head:**

A prospective, cohort study of nulliparous women presenting in active labor at term with a floating fetal head (station  $\geq -3$ ,  $n=108$ ) or engaged fetal head ( $n=241$ ). Cesarean section rates for failure to progress were significantly higher in the study group (14.1% vs. 4.2%,  $p<0.001$ ), and the second stage of labor was prolonged (60.3  $\pm$  27.1 vs. 44.9  $\pm$  30.2 minutes,  $p<0.001$ ). None of the women who had a persistently floating fetal

head at 4cm of cervical dilatation delivered vaginally. Birth weights were larger ( $p<.001$ ) and Apgar Scores lower ( $p<.001$ ) in the study group. The lengths of the active phase and instrumental delivery rates were similar in the two groups. The study concluded that nulliparous women presenting in active labor at term with a floating head are at substantially increased risk of cesarean section for abnormal progress of labor. However, the majority of patients will still deliver vaginally. Persistently floating head with advanced cervical dilatation (4cm) should prompt consideration of cesarean section since little is to be gained by waiting (*Debby et al., 2007*).

- **Maternal height:**

There was no statistically significant difference between the rates of C.S in patients who were 150 cm or less in height and patients who were taller than 150 cm ( $p>.05$ ) (*Kara et al., 2009*).

- **Pelvimetry:**

Cephalopelvic disproportion is a subjective diagnosis based on a clinical suspicion that the baby is either too large or malpositioned, or the pelvis too small for a vaginal delivery or both (*Ness et al., 2009*).

## **VAGINAL BIRTH AFTER CESAREAN SECTION**

### **Definition**

**G**iving birth vaginally after a previous cesarean section (ACOG, ۲۰۱۰).

In an attempt to reduce cesarean sections one of the most important contributing factors would be rejection of the historical dictum “Once a cesarean section, always a cesarean section”. It is logical that such an approach would eventually disappear. Today the advent of the low segment incision together with better control of post cesarean infections has decreased the risk of uterine incision dehiscence during subsequent pregnancies (Depp, ۲۰۰۲).

Worldwide rise in cesarean section (CS) rate during the last three decades has been the cause of alarm and needs an in depth study. The procedure is not simple and needs to be performed only when circumstances distinctly require it. Before ۱۹۷۰s, the phrase “one a cesarean, always a cesarean” dictated obstetric practice.

Later because of escalating rates of cesarean section (CS), suggestions were made that vaginal birth after CS (VBAC) might help in reducing the rates of CS. In an appropriate clinical setting and properly selected group of women, VBAC is safe and effective. All post cesarean pregnancies do not

require repeat CS and a majority of them may have uncomplicated vaginal delivery (*Shah Jitesh and Mehta Meghana, २००१*).

### Selecting Candidates for a Trial of Labor

As the number of women who attempt vaginal birth after previous cesarean delivery increases, it should be focused on trying to develop reliable methods of identifying women who should and should not undertake a trial of labor after cesarean delivery (*Mc Mahon, १९९८*).

Because morbidity is more common in those with a failed trial of labor, the accurate prediction of the likelihood of having a successful or a failed trial of labor has become an important area of obstetric research (*Macones et al., २००१*).

Case selection for the trial for vaginal delivery was done as per ACOG guidelines:

- Singleton pregnancy
- Gestational age > ३६ weeks
- History of previous one LSCS
- Non recurrent indication for the previous LSCS (*Shah Jitesh and Mehta Meghana, २००१*).

Women with prior successful VBAC attempts are at low risk for maternal and neonatal complications during subsequent VBAC attempts. An increasing number of prior VBACs are