CONTEMPORARY STATUS OF CESAREAN DELIVERY

Thesis

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ABSTRACT

***Background*:** This study has been done in Abu Hammad Hospital, Obstetrics and Gynecology Department in The period between April and October 2009 on all patients who was admitted to Obstetrics Department.

Objective: The main goal of this study is a comprehensive study of cesarean deliveries regarding incidence, indications, complications and factors that contribute to the increase of the rate.

Subjects &Methods: All pregnant women who admitted with labour pain were observed for obstetric outcome as regard to age, parity, mode of delivery, medical disorders, postpartum complications, postpartum hospital stay and neonatal outcome. All data were collected from the files of the patients, tabulated and figured. This study includes 332 patients who were admitted with labour pains.

Results: The results of this study are presented in Tables (2-17) and Figures (13-17). It is found that total numbers of patients who were admitted in labour was (332). Rate of CS increased up to 40.15% in Abu Hammad hospital and this is due to previous CS, fetal distress, cephalo-pelvic disproportion, delay in childbirth and reduced parity, decrease in rate of vaginal breech delivery, short period between Pregnancies especially if previous delivery by CS and fear of complications that may occur to the scar of the uterus during trial of vaginal delivery after CS, in addition to medical complications that may occur with increased age for the mother.

Conclusion: Rate of cesarean section in Abu Hammad Hospital in the period from April to October 2009 was (133 = 40.1%), the cesarean section patient were classified according to causes of cesarean section, it has been found that (35.3%) due to previous CS, (21.8%) due to fetal distress, (15%) due to medical disorder, (9%) due to unknown Indication, (4.5%) due to CPD, (4.5%) due to malpresentations & malpositions, (5 = 3.8%) due to Breech, (2.3%) due to maternal request, (1.5%) due to precious baby, (0.8%) due to Post-date without labor pain, (0.8%) due to soft tissue obstruction, (0.8%) due to elderly primigravida. In this study a medical disorder or condition associated with pregnancy and complications were increased significantly in cesarean section group than vaginal delivery group. The hospital stay also increased significantly in cesarean section group than vaginal delivery group. As regard gravidity, premature rupture of membranes and the mean of age of the patients participating in the current study, there were no statistically significant differences between both groups of the study.

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Mohammad Salem El-Aalem

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WHO	World Health Organization
CS	Cesarean Section
US	United States
UK	United Kingdom
VBAC	Vaginal Birth After Cesarean
RCOG	Royal College of Obstetricians and Gynecologists
ACOG	American College of Obstetricians and Gynecologists
PROM	Premature Rupture of Membranes
P.P	Post Partum
A.P.H	Ante Partum Hemorrage
CPD	Cephalo Pelvic Disproportion
CSE	Combined Spinal Epidural
ASRA	American Society of Regional Anesthesia
SSIs	Surgical Site Infections
CDC	Centers for Disease Control and prevention
HICPAC	Hospital Inefction Control Practices Advisory Committee
PRCD	Planned Repeat Cesarean Delivery
P. P. H	Post Partum Hemorrage
RDS	Respiratory Distress Syndrome
RCTs	Randomized Controlled Trials
SBOC	Sengstaken Blakemore Oesophageal Catheter
PPH	Postpartum Hemorrhage
DIC	Disseminated Intravascular Coagulopathy
FFP	Fresh Frozen Plasma
DVT	Deep Venous Thrombosis
X ± SD	Mean ± Standard Deviation

INTRODUCTION

Cesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy). This definition does not include removal of the fetus from the abdominal cavity in the case of rupture of the uterus or in the case of an abdominal pregnancy **(Cunningham et al., 2005)**.

For the last 30 years, there has been a public health concern about increasing cesarean sections rates. The increase has been a global phenomenon, the timing and the rate of increase has differed from one country to another and marked differences in rate persist.

WHO estimates the rate of cesarean section to be between 10-15% of all births in developed countries. Nevertheless, the cesarean section rate in the UK was about 20% and in US, it was about 29.1% in 2004 **(Preliminary Births for 2004, 2006)**. This increase in rate is partly due to reasons other than medical necessity **(Porreco et al., 1996)**.

Reasons for this escalating trend in cesarean section rates:

This five-fold increase in cesarean rate in Western and Latin American countries had a number of possible explanations including:

1- The improved safety of the procedure contributed by antibiotics, Blood availability.

2- Decreased use of midpelvic forceps and ventouse because of a combination of fear of malpractice litigation or inexperience with the procedures has definitely contributed to increased resort to cesarean delivery.

3- The increasing use of continuous electronic fetal monitoring has been associated with increased cesarean rates as compared with intermittent

fetal heart rate monitoring. The looseness and nonstandardization of the criteria of impending fetal hypoxemia contributed to this increased rate.

4- Delivering most of breech presentations by planned term cesarean section.

5- Repeat cesarean sections; consequent to increased primary cesarean sections, repeat section has become the commonest indication of the operation, accounting for more than one-third of the indications.

6- Almost half of pregnant women in the United States are nulliparas and these have increased incidence of pregnancy and labor complications that indicate more cesarean delivery rates.

7- Women in Western societies marry late and end in becoming elderly primigravidae. This is an increasing trend in these communities. These women require more cesarean sections for their delivery **(Royal College of Obstetricians and Gynecologists, 2002)**.

Consequent to increased primary cesarean section rates, repeat section has become the commonest indication. Advocates of trial Vaginal Birth After Cesarean section (VBAC) are decreasing among the obstetricians **(Shaaban, 2006)**.

Cesarean section is indicated when vaginal delivery might carry a risk to the mother (mainly labor dystocia and previous cesarean) or to the fetus (mainly fetal distress and malpresentations) or both **(Apuzzio and Salamon, 2006)**.

Cesarean sections may be performed for maternal, fetal, or combined indications. Maternal indications include those done in the mother's interest when vaginal birth is dangerous or impossible. A section would be done for fetal indication when the fetal risk is less with

abdominal than with vaginal birth. When it is in the interest of both mother and fetus to have a cesarean delivery, we have a combined indication.

The four most common indications for cesarean section accounting for approximately 70% of these deliveries are:

1. Previous Cesarean delivery.

2. Non reassuring fetal status.

3. Failure to progress in labor.

4. Fetal malpresentation.

The interest of the mother and fetus don't always coincide. The decision making requires experience, clinical judgment, logic, and consideration of the wishes of the parents. The right decision results from understanding all factors, rather than relying on a tabulated list of indications.

The final goal of any operative indication is that the necessity of performing the operation would appear as valid in retrospect as it does in prospect. Although this goal may never be achieved in all cases, it should be sought **(Apuzzio and Salamon, 2006)**.

Cesarean section is a major abdominal surgery. So, it may have major complications e.g. hemorrhage, infection, organ injuries, and thromboembolism. The relative mortality is higher than that of vaginal delivery (2-10 folds) **(Shaaban, 2006)**.

In some cases, and most often because of emergent complications such as intractable hemorrhage, abdominal hysterectomy is indicated following delivery. When performed at the time of cesarean delivery, it is called cesarean hysterectomy. If done within a short time after vaginal

delivery, it is termed postpartum hysterectomy **(Cunningham et al., 2005)**.

During the evolution of cesarean section, key steps in reducing maternal mortality were: adherence to principles of asepsis, the introduction of uterine suturing by Max Sanger in 1882, extraperitoneal cesarean section and then moving to transverse lower-segment incision by Kronig, anesthetic advances, blood transfusion practice, and antibiotic use **(Pelosi et al., 1995)**.

Aim of the work:

This is a comprehensive study of cesarean section regarding history, incidence, indications, factors that may contribute to the increase in cesarean section rate and its complications in modern obstetric practice.

BRIEF HISTORY

Cesarean section has been part of human culture since ancient times and there are tales in both western and non-western cultures of this procedure resulting in live mothers and offsprings. Numerous references to cesarean section appear in ancient Hindu, Egyptian, Grecian, Roman, and other European folklores **(Erwin, 1982)**.

During its evolution, the indications for cesarean section have changed dramatically from ancient to modern times. Despite rare references to the operation on living women, the initial purpose was essentially to retrieve the infant from a dead or dying mother; either for saving the baby's life, or as commonly required by religious edicts, So the infant might be buried separately from the mother. It was not until the nineteenth century that the possibility of mother's living came within the grasp of medical profession **(Boley, 1991)**.

According to Greek mythology, Apollo removed Asclepius, founder of the famous cult of religious medicine, from the abdomen of his mother Coronis (figure 1) **(Boley, 1991)**.

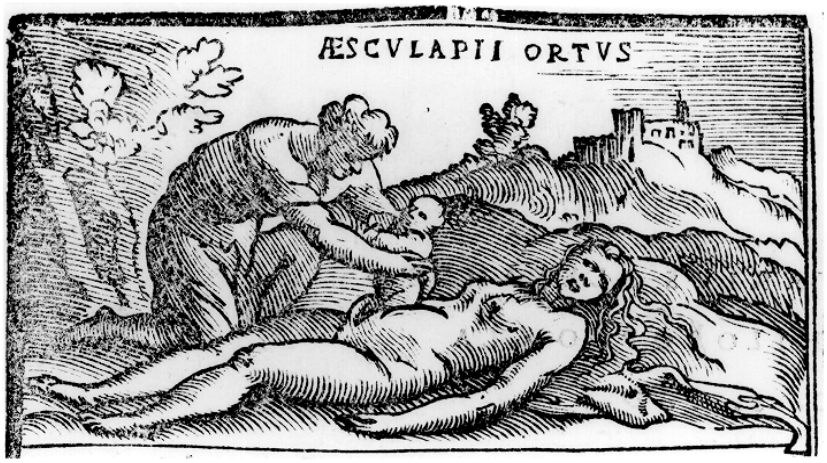

Figure (1): The extraction of Asclepius from the abdomen of his mother Coronis by his father Apollo **(US National Library of Medicine, 1998)**

The Catalan Saint, Raymond Nonnatus **(1204-1240)**, received his surname-from the Latin verb non-natus ("not born")-because he was born by cesarean section, his mother died while giving birth to him. In 1316, the future Robert II of Scotland was delivered by cesarean section, his mother died **(Williams Obstetrics, 1971)**.

There were sporadic early reports of heroic efforts to save women's lives. Perhaps the first record we have of a mother and baby surviving a cesarean section comes from Switzerland in 1500 when a sow gelder, Jacob Nufer, performed the operation on his wife. After several days in labor with help of 13 midwives, her desperate husband eventually gained permission from the local authorities to attempt a cesarean. The mother lived and subsequently gave birth normally to five children, including twins. The cesarean baby lived 77 years old. Since this story was not recorded until 82 years later, historians question its accuracy **(Boley, 1991)**.

Francis Rousset introduced the concept of performing an operation upon a living woman in the sixteenth century. He suggested several obstetric complications that were more horrific than the operation itself. He sought to establish the feasibility of the operation by giving an account of seven females who survived. He reported that another successful pregnancy may follow the operation **(Young, 1944)**.

In western society, women were bared from carrying cesarean section until late 19^{th} century, however, the first recorded successful cesarean in British Empire was conducted by a woman sometime between 1815 and 1821, James Miranda Stuart Barry performed it while masquerading as a man and serving as a physician to the British army in South Africa **(Miller and Joseph, 1938)**.

It is of interest to mention that nineteenth-century travelers in Africa reported indigenous people carrying cesarean section with own medical practice e.g. in 1879, a missionary British physician, R.W. Felkin, witnessed cesarean section performed by the Ugandan Tribe surgeons. "The patient was a healthy-looking primipara of about twenty years of age and she lay on an inclined bed, the head of which rested against the side of the hut. She was half-intoxicated with banana wine, was quite naked and was tied down to the bed by bands of bark cloth over the thorax and thighs. Her ankles were held by a man…while another man stood on her right steadying her abdomen…the surgeon was standing on her left side holding the knife. He then washed his hands and the patient's abdomen first with banana wine and then water. The surgeon made a quick cut upwards from just above the pubis to just below the umbilicus severing the whole abdominal wall and uterus so that amniotic fluid escaped. Some bleeding points in the abdominal wall were touched with red hot irons. The surgeon completed the uterine incision, the assistant helped by holding up the sides of the abdominal wall with his hand and hooking two fingers into the uterus. The child was removed, the cord cut, and the child was handed to an assistant". The report goes on to say that the surgeon squeezed the uterus until it contracted, dilated the cervix from inside with his fingers (to allow postpartum lochia to escape), removed clots and the placenta from the uterus, and then used red hot irons to seal the bleeding points. The peritoneum, the abdominal wall, and the skin were approximated back together and secured with seven sharp spikes. A root paste was applied over the wound and a bandage of cloth was tightly wrapped around it. Within 6 days, all the spikes were removed. Felkin observed the patient for 11 days, and when he left, mother and child were alive and well (figure 2) **(Gabert and Harvey, 1988 and Lurie and Glezerman, 2003)**.

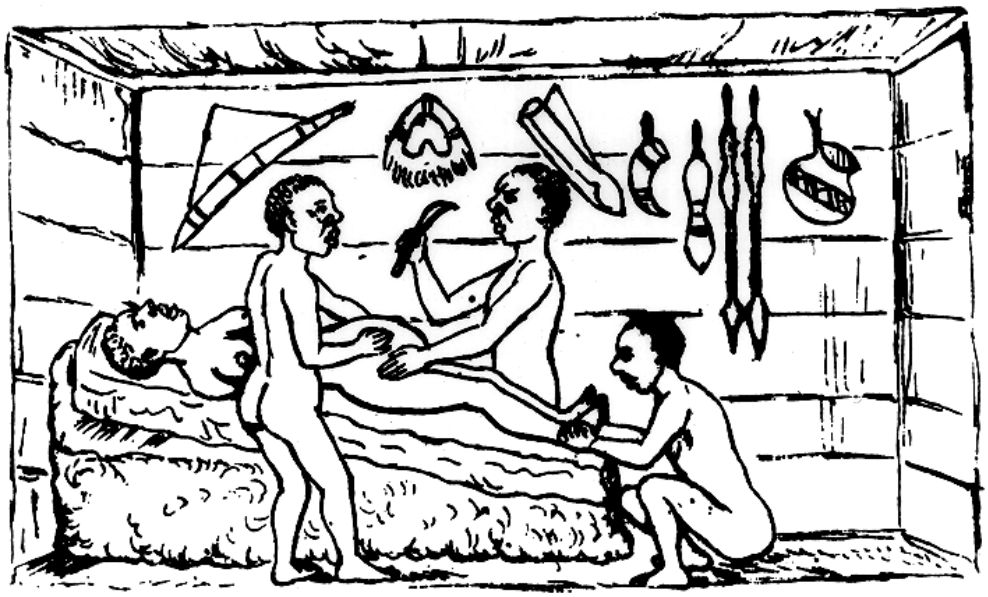

Figure (2): Successful cesarean section performed by indigenous healers in Kahura, Uganda as observed by R.W. Felkin in 1879

A new era in surgical practice in 1846 at Massachusetts General Hospital when a dentist, William Morton, used diethyl ether as an operative anaesthetic. Anaesthetics permitted surgeons to take the time to operate with precision, to cleanse peritoneal cavity, to record the details of their procedures, women were spared the agony of operation and were less susceptible to shock. But, mortality rates remained high with infections septicemia, peritonitis, forming large percentage of deaths. In mid 1860s, the British surgeon Joseph Lister introduced carbolic acid as an antiseptic. But unfortunately, surgical techniques of that day also contributed to high maternal mortality rate to the degree that cesarean section performed in Paris between 1787 and 1876 demonstrated 100 percent maternal mortality mainly due to hemorrhage as they thought that uterine stitches would cause infection and rupture in subsequent pregnancy. They thought that uterine muscle will contract, close spontaneously. As a result, women died from blood loss more than infection **(Sewell and Bodies, 1990)**.