Prevalence of Cesarean Scar Niche after Single Cesarean Section and Its Association with Possible Related Symptoms

Thesis

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By

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

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Rania Zakaria

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List of Abbreviations

Abbrev.	Full-term
AVF	: Anteveted -Anteflexed uterus
CS	: Cesarean section
CSD	: cesarean scar defect
GIS	: Gel Instillation Sonography
HSG	: Hysterosalpingiogram
PBAC score	: Pictorial Blood Loss Assessment Chart
RVF	: Retroverted -Retroflexed uterus
SCSH	: Saline contrast sonohysterography
SIS	: Saline infusion sonohysterography
TVUS	: Trans-vaginal ultrasound
V AS	: Visual analogue scale

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Introduction

Over the past two decades, the rates of Cesarean section (CS) have been rising in both developed and developing countries. In the UK, the rates of CS have risen from 12 to 29% between 1990 and 2008 ***(Betran, 2007),*** In the US, one in every three women delivered by CS in 2011***(Barros et al., 2011).*** In China, the rates of CS have risen from 2% in 1985 to 35-85% in 2010 ***(Feng et al., 2014),*** whereas in Brazil, the rates have risen from 15% in 1970 to 80% in 2004 ***(Osterman and Martin, 2014).*** In Egypt CS rates have risen from 4.6% to 51.8% over the last 24 years ***(Ministry of Health and Population, 2015).***

The remarkable increase in C.S rates has raised the interest in studying the long-term sequelae of C.S delivery. This interest has focused on future obstetric complications including morbid placental adherence, uterine rupture and intra-peritoneal-adhesions related surgical complications ***(Diaz et al., 2002; Silver, 2010; Clarkand Silver, 2011).***

Nevertheless, a recent interest has developed regarding the long-term gynecological sequelae of CS; mainly its association with abnormal uterine bleeding, dysmenorrhea and chronic pelvic pain ***(Wang et al., 2009; Bij de Vaate et al., 2011; van der Voet et al., 2014).***

Cesarean scar morphological abnormalities have been well visualized by trans-vaginal sonography (TVS), gel or saline instillation sonohysterography (GIS or SIS) or hysteroscopy. Several terms have been proposed to describe such defects ***(Osser et al., 2010; Bij de Vaateet al., 2011; van der Voet et al., 2014)***.

The term 'niche' was first introduced by Monteagudo in 2001, which describes the presence of a hypo echoic area within the myometrium at the site of previous CS scar ***(Monteagudo et al., 2001).***The prevalence of such CS 'niche' has been reported to range between 11 and 45% ***(Bij de Vaate et al., 2011; van der Voet et al., 2014).***This wide range of prevalence is mainly explained by the different methods of diagnosing such CS scar defects. It has been shown that niches are identified in the scar of previous CS more frequently when contrast sonohysterography rather than TVS is used as a diagnostic tool [56% vs. 24%] ***(Bij de Vaate et al., 2011).***

Although the term 'niche' was first introduced in 2001, the association between CS scar defect and abnormal uterine bleeding was not that recent. In 1999, Thurmond et al. postulated that a defect in the CS scar could be a cause of abnormal uterine bleeding due to collection of menstrual blood in the defect causing postmenstrual spotting ***(Thurmond et al., 1999).***

Recent studies have shown such an association. In the study conducted on 225 women with previous CS, niche was identified in 56% of women with gel instillation sonohysterography (GIS). Postmenstrual spotting was reported by 33.6% of women with a niche, and 15.2% of women without a niche (p=0.002) ***(Bij de Vaate et al., 2011).***In a subsequent analysis, postmenstrual spotting was Observed on 172 women, the rates of postmenstrual spotting in those with and without a niche were 28.9% and 6.9%, respectively (p=0.02) ***(van der Voet et al., 2014).***

Aim of the Work

The aim of the current study is to identify the prevalence of CS scar niche in women 6 weeks to 6 months after a single previous CS, and to evaluate its association with abnormal uterine bleeding, dysmenorrhea and urinary symptoms.

Chapter (1)
Cesarean Section

Cesarean delivery also known as a C-section is a surgical procedure used to deliver a fetus through an incision in the mother's abdomen (laparotomy) and a second incision in the mother's uterus after 28 weeks of pregnancy ***(Hedwige Saint Louis, 2017).*** It is called hystrotomy, if removal is done before 28 weeks of pregnancy. This definition does not include removal of the fetus from the abdominal cavity in cases of uterine rupture nor in cases of abdominal pregnancy ***(Cunningham et al., 2007).***

Historical background

The exact origin of the term cesarean delivery is unclear. The popular beliefs that Julius Cesar was born in this manner with the result that the procedure became known, but several circumstances have weaken this explanation. First, the mother of Julius Cesar lived for many years after his birth in 100 BC, and as late as the 17th century, the operation was almost invariably fatal. Second, the operation whether done on living or dead women, is not mentioned by any medical writer before the middle age ***(Cunningham et al., 2007).*** In 1500 AC., The first successful cesarean delivery on a living woman was thought to have been performed by Jacop Nufer, who operated on his wife following several days of unsuccessful labour.

While the first authenticated cesarean delivery was performed by Trautmann of Wittenberg in 1610, with the mother succumbing to post- operative infection 25 days later ***(Larry et al., 2002).***In 1900, Pfannenstiel has made his transverse skin incision in which, the skin is incised in a transverse upward concavity, typically initiated two finger-breadths above the upper border of the symphysis pubis and extended laterally in the direction of the anterior superior iliac spines below and medial to it about 2-3 cm ***(Larry et al., 2002).*** In 1912, Kronig recommended a trans-peritoneal approach with a vertical midline incision in the lower uterine segment.He and others notice that maternal mortality rate less than 4% while other obstetricians advocated using a transverse uterine incision trans-peritoneally ***(Larry et al., 2002).***

Incidence of cesarean section

The rate of CS is expressed as a percentage calculated by dividing the number of cesarean deliveries over the total number of live births ***(Betran et al., 2014)***.WHO proposed in 2015 the use of the Robson Classification system as a global standard for assessing, monitoring and comparing CS rates and its use has increased spontaneously worldwide over the last decade. This classification allows analyses of CS rates according to important maternal and fetal variables (E.g. parity,