INTRODUCTION

Caesarean section is the delivery of fetus through abdominal incision in the abdominal wall (laparotomy) and uterine wall (hystorotomy) this definition does not include the removal of fetus from abdomen in ectopic abdominal pregnancy or ruptured uterus. It is one of the most commonly performed major operations in women throughout the world **(Koroglu et al., 2013).**

Multiple cesarean deliveries also increase the risk of implantation on the scar, likely due to an increased scar surface area.

Cesarean scar pregnancy (CSP) is a rare form of ectopic, pregnancy resulting from implantation of an embryo on previous cesarean scar. It can be devastating because of complications such as uterine rupture and massive hemorrhage, leading to increased maternal morbidity and mortality **(Seow et al., 2004).**

Up to 72% of cesarean scar pregnancies occur in women who have had 2 or more cesarean deliveries. The dehiscent myometrial defect may be related to incomplete healing or increased fibrosis along the uterine scar. Fibrosis occurring after multiple cesarean deliveries leads to poor vascularity, which impairs healing **(Koroglu et al., 2013).**

With the increasing prevalence of cesarean section (CS) birth and the widespread use of ultrasonography in early gestation, the rate of CSP had been exponentially increased.

Nearly 52 percent of women in Egypt give birth by C-section. That rate is 3.5 times higher than it should be, considering the World Health Organization has set the target C-section rate at 15 percent. The rate of C-sections has nearly doubled since the last demographic health survey in 2008, when it was estimated to be around 27 percent. It's expected to continue rising in the upcoming years **(WHO, 2015).**

Methotrexate is an antimetabolite drug that has been used successfully in conditions associated with trophoblastic proliferation. Systemic methotrexate is a standard treatment for tubal and cervical ectopic pregnancy in early gestational age **(Wang et al., 2011).**

Systemic or local methotrexate therapy could avoid unnecessary laparotomy and preserve fertility in some patients, but it required time and patience **(Ravhon et al., 1997).**

As cesarean scar pregnancy is a condition of reproductive age, the conservation of fertility is the main concern for the patient and the gynecologist. Therefore, invasive and radical treatments, such as hysterectomy and hystorotomy, have recently been replaced by medical and minimally invasive therapies, and also some combinations of both **(Seow et al., 2004).**

AIM OF THE WORK

The aim of this study is to evaluate the efficacy and safety of methotrexate therapy for the treatment of cesarean scar pregnancy according to last five years' experience of Ain Shams University maternity hospital.

CESAREAN SECTION

Cesarean delivery is defined as birth of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hystorotomy) does not include removal of fetus from abdominal cavity **(Munro, 2007).**

Incidence of cesarean Section:

For many years, the incidence of the procedure was stable (3-5%) yet since 1960s, the rate of cesarean section was rising steadily reaching (20-25%) in the late 1980s **(Seow et al., 2004).**

The reasons for the continued increase in the cesarean rates are not completely understood, but some explanations include the following **(Seow et al., 2004)**:

1. Women are having fewer children, thus, a greater percentage of births are among nulliparas, who are at increased risk for cesarean delivery.
2. The average maternal age is rising, and older women, especially nulliparas, are at increased risk of cesarean delivery.
3. The use of electronic fetal monitoring is widespread. This technique is associated with an increased cesarean delivery rate compared with intermittent fetal heart rate auscultation.

4. Most fetuses presenting as breech are now delivered by cesarean.
5. The incidence of forceps and vacuum deliveries has decreased.
6. Rates of labor induction continue to rise, and induced labor, especially among nulliparas increases the risk of cesarean delivery.
7. The prevalence of obesity has risen dramatically, and obesity increases the risk of cesarean delivery.
8. Rates of cesarean delivery for women with preeclampsia have increased, whereas rates of labor induction in these patients have declined.
9. Vaginal birth after cesarean VBAC has decreased from a high of 26 percent in 1996 to a rate of 8.5 percent in 2007.
10. Elective cesarean deliveries are increasingly being performed for a variety of indications including concern for pelvic floor injury associated with vaginal birth, medically indicated preterm birth, to reduce the risk of fetal injury, and for patient request.

Indications for cesarean Section:

It is not possible to catalogue comprehensively all appropriate indications for cesarean delivery, over 85 percent are performed because of prior cesarean delivery, dystocia, fetal distress, or breech presentation **(Grantcharov and Rosenberg, 2001)**.

Indications can be considered under three main categories (Grantcharov and Rosenberg, 2001):

1. **Indisputable indications:**
    a) Placenta Previa.
    b) Demonstrable fetal hypoxia or imminent fetal demise.
    c) Unequivocal cephalopelvic disproportion.
2. **Generally accepted indications:**
    These include many conditions which, depending on their severity, may present ranging from an absolute to a relative need for cesarean section.
    a) Previous cesarean section: Is one of the commonest indications.
    b) Breech presentation: At term.
    c) Dystocia: manifest by non-progressive labor makes up an increasing proportion of all cesarean deliveries
3. **Maternal indications** are not common but there are a number of maternal disorders and include severe pre-eclampsia, eclampsia, cardiovascular disease and diabetes, in a number of these cases conditions may be favorable for vaginal delivery but in other cesarean delivery is warranted.

According to urgency (Luca's classification of urgency) (Cunningham et al., 2014):

1- Emergency caesarean section: Immediate threat to the life of the woman or fetus. This will include cesarean section for sever prolonged fetal bradycardia, fetal scalp PH less than 7.2, cord prolapse, and uterine rupture, these cesarean should occur as quickly as possible and certainly within 30 minutes.

2- Urgent: Maternal or fetal compromise which is not immediately life-threatening. These include conditions such as antepartum hemorrhage and non-progressive labor with maternal or fetal compromise.

3- Scheduled: No maternal or fetal compromise but early delivery required. This will include non-progressive labor without maternal or fetal compromise, and women looked for elective cesarean section who are admitted with ruptured membranes or in early labor, it is recommended that these women be delivered within 75 minutes.

4- Elective planned cesarean section timed to suit the woman and staff.

Procedure of cesarean section (Ravhon et al. 1997):

1. Informed consent.
2. Preoperative considerations as:

   - Preoperative blood testing: Complete blood count, blood group and antibody screen

   - A urinary (Foley) catheter is placed in the bladder once regional anesthesia has been established

   - Antacid prophylaxis should be administrated in the form of a histamine H2 receptor blocker (ranitidine or cimetidine)

   - The woman should be placed in a 15 degree left lateral tilt to avoid aorto-caval compression-preoperative shaving of the incision site is not required, if the pubic hair over the proposed incision site is thick it can be clipped, rather than shaved.
3. Surgical procedure

Types of cesarean section (Monaghan et al., 2004):

A. Lower segment cesarean section.

B. Classical cesarean Section.

I. Abdominal wall incisions:

A. Horizontal incisions:

1) The Pfannenstiel incision

Pfannenstiel incision is the most commonly used incision; the skin and subcutaneous tissues are incised using a transverse curvilinear incision at a level of two fingerbreadths above the symphysis pubis, extending

from and to points lateral to the lateral margins of the abdominal rectus muscles.

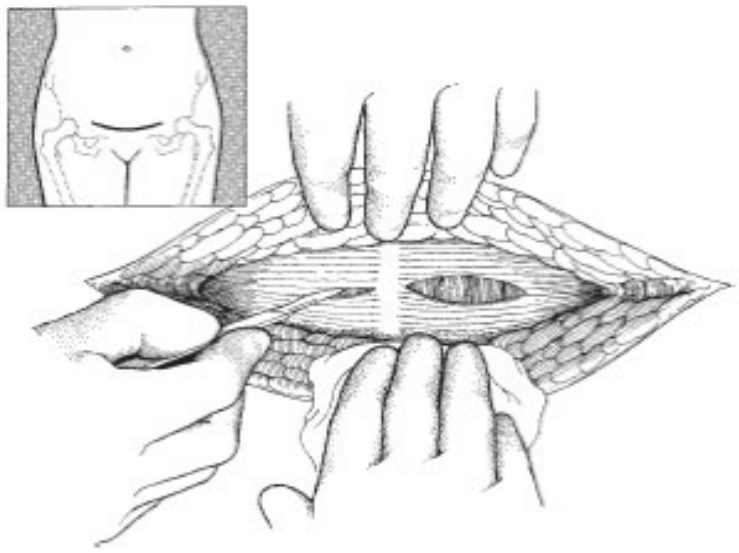

Figure (1): Pfannenstiel horizontal incision of anterior abdominal wall

2) Joel-Cohen and modified Joel-Cohen incisions.

This is a straight transverse incision through skin only, 3 cm below the level of the anterior superior iliac spines (higher than the Pfannenstiel incision). The subcutaneous tissues are opened only in the middle 3 cm. The fascia is incised transversely in the midline then extended laterally with blunt finger dissection. Blunt separation of tissues along natural tissue planes with a minimum of sharp dissection and non-closure of both layers of the peritoneum, they have advantages over Pfannenstiel and traditional (lower midline)

caesarean section techniques in terms of short-term outcomes such as operation time, fever and estimated blood loss.

3) Maylard incision.

The incision is made down to the rectus fascia. The rectus fascia and rectus muscles are transected by using the electrosurgery technique, where the muscle is totally transected. It affords extensive exposure to the pelvic organs when this is needed. Its main disadvantage is that it is a more painful incision for the patient during the first postoperative week.

4) Cherney incision.

It combines the excellent exposure of a Maylard incision and the strength of a Pfannenstiel incision. Where the rectus muscles are separated, the Cherney permits the detachment of these muscles from their insertion on the pubes, and allows them to retract upward “like a window shade.” It begins with a low transverse incision of the abdominal skin and rectus sheath similar to the Pfannenstiel incision. The sheath is then elevated off the rectus abdominis muscle inferior to the fascial incision until the pubic bone is reached; superior dissection of the fascia need not be done. Leaving the pyramidalis muscle attached to the rectus sheath minimizes unnecessary bleeding.

B. Vertical Incisions:

1) Median incision:
   Implies a vertical incision through skin, subcutaneous fat, linea alba, and peritoneum. Most of the fibers, crossing the linea alba in a medio-caudal and medio-proximal direction, are cut transversely. Midline incision is still the incision of choice in conditions that require rapid intra-abdominal entry, as it is quicker and can easily be extended. But transverse incisions are preferred as the early postoperative period is associated with fewer complications (pain, burst abdomen, and pulmonary morbidity) and there is lower incidence of late incisional hernia after transverse compared with vertical laparotomy.
2) Paramedian Incision:
   An alternative for the standard midline incision, this technique stays clear of the relatively avascular linea alba, possibly avoiding impaired wound healing. This technique is more complex than the midline incision, resulting in increased opening time (average 13 minutes) and blood loss. Exposure of the abdomen is better on the side of the incision than on the contralateral side. The possibilities for extending the incision superiorly are limited by the costal margin.

II. Uterine incisions:

As with the skin incision, the nature of the uterine incision is determined by the clinical situation, the lower uterine incision is used in more than 95% of cesarean deliveries due to ease of repair, reduced blood loss and lower incidence of dehiscence or rupture in subsequent pregnancies when compared with the alternative incisions.

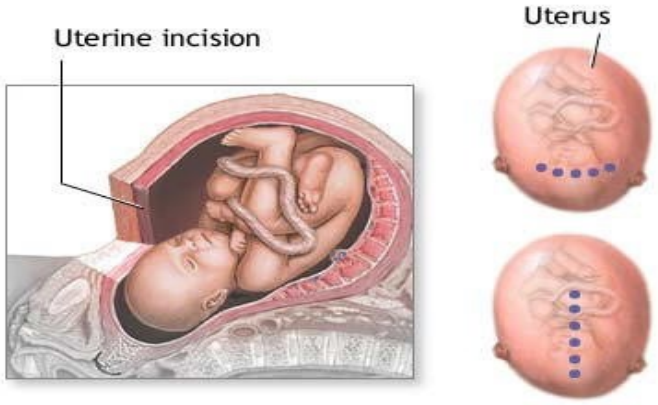

Figure (2): Uterine Incisions.

Transverse incision is the favored type because it shows better healing, and allows vaginal deliveries in the future. The classical incision is vertical, it provides a larger opening than a low transverse incision, and it is used in critical situations such as placenta previa. However, the classic incision causes more bleeding, a greater risk of abdominal infection, and a weaker scar.

III. Uterine closure:

Closure should be performed in either single or double layers with continuous or interrupted sutures.

A large prospective study has shown no increase in postoperative complications with a 1-layer versus 2-layer closure. Single-layer closure, compared with double-layer closure, was associated with a statistically significant reduction in mean blood loss, duration of the operative procedure, and presence of postoperative pain.

Most studies have not demonstrated any advantage of 2-layer closure compared with 1-layer closure in decreasing the rate of uterine rupture in a subsequent pregnancy. At least 1 study reported a 4-fold increase in the risk of uterine rupture when comparing 2- to 1-layer closure.

IV. Abdominal closure:

Closure is performed in the anatomical planes. Many physicians prefer to not close the peritoneum because these surfaces reapproximate within 24-48 hours and can heal without scar formation. Furthermore, the rectus muscles to do not need to be reapproximated.

The subcutaneous tissue usually does not have to be reapproximated, but patients with subcutaneous depth greater than 2 cm may benefit from subcutaneous tissue closure.

Placement of drains does not appear to aid in decreasing the risk of surgical site infection.

The skin may be closed by many techniques, the most common involve surgical staples, subcuticular stitches or tension sutures.

Complications of caesarean section (Burger et al., 2002):

A. Intraoperative complications

1. Hemorrhage

Hemorrhage accounts for 6 percent of deaths associated with cesarean section and an unknown proportion of operative morbidity. This complication may be due to the operative procedure as a consequence of damage to the uterine vessels, or may be incidental as a consequence of uterine atony or placenta praevia. There are many maneuvers that may be employed to manage such cases, which range from bimanual compression, infusions of oxytocin and administration of 15-methyl prostaglandin F2 alpha to conservative surgical procedures such as uterine compression sutures, to the more radical, but lifesaving, hysterectomy**.**

2. Bowel damage

Bowel damage is rare at cesarean section, but may occur during a repeat procedure or if adhesions are present from previous surgery. Damage is often recognized by smell or the observation of fecal soiling, the management is dependent on

the site of the injury, and is best conducted in conjunction with a general surgeon.

3. Urinary tract damage

Direct injury to the bladder is not uncommon during cesarean section. The transverse lower abdominal incision carries the risk of cystotomy, especially after prolonged labors where the bladder is displaced caudally, after previous cesarean section where scarring obliterates the vesico-uterine space, or where a vertical extension to the uterine incision has occurred.

4. Cesarean hysterectomy

The most common indication for cesarean hysterectomy is uncontrollable maternal hemorrhage, a situation not infrequently associated with a morbidly adherent placenta. This operation, whilst a major undertaking, should not be left too late, as the risk of operative complications, maternal morbidity and mortality increase with increasing hemorrhage, although postpartum hemorrhage is relatively common (occurring after about 1 per cent of deliveries), life threatening hemorrhage requiring immediate treatment affects only 1 in 1000 deliveries.

B. Postoperative complications (Abalos, 2009):

1. Infection and endometritis

The single most important risk factor for postpartum maternal infection is cesarean delivery, and women undergoing