

**Effect of Double Lock Technique versus Continuous
Non Locking Technique for Closure of Rectus Sheath
in Cesarean Section on Post-operative Pain:
A Randomized Controlled Trial**

Thesis

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List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
CNS	: Central nervous system
CS	: Cesarean section
IASP	: International Association for the Study of Pain
NRS	: Numeric Rating Scale
SLE	: Systemic lupus erythematosus

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ABSTRACT

Background: The post-cesarean section pain is characterized as acute, and is closely related to the damage caused to the tissue due to the inflammatory reactions derived from a traumatic process, which produce pain. **Aim of the Work:** The aim of this study was to compare closure of anterior rectus sheath by double-lock technique versus its closure by conventional continuous non-locking technique as regards post-operative pain after cesarean through Pfannenstiel incision. **Patients and Methods:** This randomized controlled trial was conducted at Ain Shams university maternity hospital, the study included 150 women at reproductive age who were admitted for delivery at term. Data was analysed for 147 women as 3 women could not be reached by phone postoperatively and were not included in analysis. **Results:** The study revealed a statistically significant difference between double lock and continuous non locking groups regarding average static pain scores in 24 hours postoperatively [5th days, 6th days and 7th days). It revealed also highly statistically significant difference between double lock and continuous non locking groups regarding average dynamic pain scores in each 24hrs postoperatively for 7 days during standing and walking. **Conclusion:** Double lock technique for closure of rectus sheath in cesarean section decreases both post-operative static pain and dynamic pain during walking, sitting down and standing up. **Recommendations:** Further studies are needed to shed more light on double lock technique as a useful tool to decreases postoperative pain.

Key words: double lock technique, continuous non-locking technique, closure of rectus sheath, cesarean section, postoperative pain

Introduction

Caesarean section is the commonest major operation performed on women in the world (*Hofmeyr et al., 2004*).

The World Health Organization recommends that cesarean sections are 10% to 15% of total labor (*Villar et al., 2006*).

The cesarean section should be utilized when, during the pregnancy evolution, labor or delivery, there are specific situations where the surgical procedure becomes necessary in order to preserve the mother's and/or fetus life. This delivery type was recognized as a safe technique in order to obtain better obstetrical results, which became one of the reasons to justify why the number of cesarean sections increased. However, its usage did not lead to a reduction of mothers' morbidity or mortality. On the contrary, the cesarean section increases mortality and morbidities, such as bleeding, infections, pain, among others (*Silvasalc et al., 2005*).

The pain presented after a cesarean section makes the recovery difficult and delays mothers. Contact with the newborns, besides being an obstacle to a good breastfeeding position, self-care, newborn care, and to perform daily activities, such as sitting down and standing up, walking, performing personal hygiene activities, among others (*Granot et al., 2003*).

The post-cesarean section pain is characterized as acute, and is closely related to the damage caused to the tissue due to the inflammatory reactions derived from a traumatic process, which produce pain (***Tribioli et al., 2003; Buhagiar et al., 2011***).

Cesarean section involves two components, somatic pain from the wound and visceral pain from uterine cramps (***Lavand'homme et al., 2006***).

There are many possible ways of performing a caesarean section Operation, and operative techniques vary widely. The techniques used may depend on many factors including the clinical situation and the preferences of the operator (***Hofmeyr et al., 2004***).

For elective surgery more than 80% used The Pfannenstiel abdominal entry and double-layer uterine closure. For emergency surgery, more used the Joel-Cohen abdominal entry (***Dandolu et al., 2006***).

The rectus sheath is the fibrous material which encloses the muscles of the abdominal wall. For closure of the rectus sheath, there are several possible suturing techniques and materials (***Tully et al., 2002***).

The best method of rectus sheath closure would be one that provides adequate tensile strength to the incision until the

wound is healed, approximates the tissue in a way that normal healing mechanisms can occur under optimal circumstances, remains secure even in the presence of local or systemic infection, the suture material is well tolerated and, finally, should be able to be done with expediency (*Jones et al., 1941*).

A survey of techniques used in caesarean section operations by obstetricians in the UK conducted in 1999 found that the majority of operators (73%) used a continuous non-locking suture, 21% used a continuous non-locking suture with a single central lock, and the remainder used a continuous locking suture (5%), interrupted sutures (less than 1%), or more than one technique. Vicryl was the most commonly used suture material (87%) (*Tully et al., 2002*).

Proponents of the interrupted closure may argue about the division of the stress at the points of sutures so that in an untoward event of any suture cut-through, the others maintain the wound integrity. However, apart from being a time-consuming procedure, it may require a great length of the suture material and tend to add multiple knots to the subcutaneous space those are likely to cause more pain to the patient postoperatively (*Murtaza et al., 2010*). Proponents of the continuous suturing method may evoke about the suture's "see-saw effect" of adjusting to the dynamic stresses and strains occurring during one's physical movements. Apart

from being faster and cost effective, it also minimizes the number of sub-cutaneous knots and the rate of incisional hernia formation (*Weiland et al.,1998*), (*Hodgson et al., 2000*). However, the integrity of such a wound depends entirely on the security of the single filament of the suture material (*Ceydeli et al., 2005*).

In this regard the double-lock technique (two continuous and third double-lock) described here tries to maintain the advantages of both the continuous and the interrupted methods of closure by dividing or breaking the tension on the entire length of suture material at the points of double-locking. This, not only tends to allow an equal distribution of tension throughout the suture length, but also remains more physiological as far as the motion-dynamics of the anterior abdominal wall are concerned (*Jategaonkar and Yadav, 2013*).

Aim of the Work

The aim of this study was to compare closure of anterior rectus sheath by double-lock technique versus its closure by conventional continuous non-locking technique as regards post-operative pain after cesarean through Pfannenstiel incision.