Insertion of Intrauterine Contraceptive Device at Cesarean Section: "Randomized Clinical Trial"

Thesis

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By

Hossam Nabil Bartella

M. B., B.Ch, Ain Shams University 2012
Resident of Obstetrics & Gynecology
El Tahrir General Hospital

Under Supervision of

Prof. Abdel-Latif Galal Ahmed El-Kholy

Professor of Obstetrics & Gynecology
Faculty of Medicine, Ain Shams University

Prof. Mohamed Samir Sweed

Assistant Professor of Obstetrics & Gynecology
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
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Hossam Nabil Bartella

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List of Abbreviations

Abb.	Full term
ABP	*Arterial blood pressure*
AIDS	*Acquired immune deficiency syndrome*
BMI	*Body mass index*
CDC	*Centers for disease control and prevention*
CS	*Cesarean section*
CSE	*Combined spinal epidural anaesthesia*
EC	*Emergency contraception*
GA	*Gestational age*
Hb	*Haemoglobin*
IM	*Intramuscular*
IPPIUD	*Immediate Post placental intra uterine contraceptive device*
IUD	*Intrauterine contraceptive device*
IUGR	*Intra uterine growth restriction*
LNG-IUD	*Levonorgestreal restriction intra uterine contraceptive device*
NSAIDS	*Non steroidal anti inflammatory drugs*
PID	*Pelvic inflammatory disease*
SD	*Standard deviation*
STI	*Sexually transmitted infection*
U.S	*Ultrasound*
VAS	*Visual analogue scale*
WHO	*World Health Organization*

INTRODUCTION

Intrauterine contraceptive device (IUD) is the second most common modern method of contraception used by women in regions with large populations ***(Ding et al., 2007).***

It is favored by women who wish to adopt a contraceptive method that does not require regular motivation for use, or husband's participation and are not suitable for using hormonal methods ***(Khawaja et al., 2004).***

The main disadvantage of IUD contraception is the rate of expulsion and side effects, such as pain and bleeding, which may necessitate its early removal ***(Kapp & Curtis, 2009).***

The mode of delivery, the physical properties of the IUD and the method and timing of insertion are all potential factors that may influence the outcome of IUD use and have been the subject of various studies ***(Kapp & Curtis, 2009).***

During the postpartum time period, women are often highly motivated to initiate contraceptive use. Intrauterine device (IUD) insertion during this time period is an ideal method for some women, as it does not interfere with breastfeeding, is convenient for both women and their health care providers, is associated with less discomfort and fewer side effects than interval insertions and allows women to obtain safe, long-acting, highly effective contraception while already within the medical system ***(Ricalde et al., 2006).***

Postpartum IUD insertion, however, may increase the risk of adverse events affecting safety (e.g., perforation, pain, bleeding) as well as effectiveness (i.e., expulsion). Whether postpartum IUD insertion increases the risk of expulsion or perforation or not has been of particular concern to researchers and clinicians ***(Ricalde et al., 2006).***

IUD can be inserted vaginally after the puerperium as an interval procedure. Alternatively, vaginal insertion, immediate postpartum, following the delivery of the placenta or an abortion may be done. Intra-operative insertion at cesarean section is another option ***(Rodriguez et al., 2014).***

Traditionally, healthcare providers have been weary of inserting intrauterine contraceptive device (IUD) either during puerperium or in a scarred uterus (e.g. due to cesarean section) for fear of perforating it or introducing infection. With rising rates of cesarean section, the number of women who would be excluded from using this method of contraception would go on increasing sharply, if the same practice were to be encouraged ***(Goldstuck & Steyn, 2013).***

A fair number of women undergoing cesarean section are good candidates for using the IUD for contraception. It offers the obstetrician an opportunity to insert the IUD into the uterus under vision, thus obviating the fear of perforating the uterus during the procedure. A number of women fail to return for availing contraceptive services, once they leave hospital. IUD

insertion also offers women a chance to avail this method of contraception at the same time as they have cesarean section ***(Wildemeersch et al., 2016).***

The objective of this study is to evaluate and compare the efficacy of IUD (Pregna T Cu 380A) insertion at cesarean section and after puerperium in terms of expulsion rate, pain and amount of bleeding.

Aim of the Work

The aim of this work is to evaluate and compare the efficacy of IUD insertion at cesarean section and after puerperium in terms of expulsion rate.

Chapter (1)

INTRAUTERINE CONTRACEPTIVE DEVICE

The modern intrauterine contraceptive device (IUD) is a form of birth control in which a small T'-shaped device, containing either copper or progesterone, is inserted into the uterus. IUDs are a form of long-acting reversible contraception, which is the most effective type of reversible birth control ***(Winner et al., 2012).***

Historical overview

As frequently told, Arab traders inserted small stones into the uteruses of their camels to prevent pregnancy during long journeys. Although it was later repeated as truth, it is not well-documented ***(Speroff and Darney, 2017).***

The first IUDs for women were developed in 1902 in Germany as a variation of vaginal pessaries. These early IUDs were rigid metal appliances, covering the opening of the cervix and were attached to stems extending into the cervical canal. They were multipurpose devices that only indirectly acted as contraceptives ***(Tatum et al., 1996)***.

In 1923 *Pust* combined *Richter's ring* with the old button-type pessary and replaced the wire with catgut threads and Ernst Gräfenberg of Germany published a report on an IUD

made of silk suture in 1929. In 1930, Gräfenberg reported a lower pregnancy rate using an improved ring wrapped in silver wire. The silver wire was contaminated with 26% copper ***(Huber et al., 1975).***

In 1934, Ota in Japan developed a variation of the *Gräfenberg ring* that contained a supportive structure in the center. The addition of this central disc was to stabilize the device and reduce expulsion rate and called it ***Ota ring (Ota, 1934).***

In the 1960s, the IUDs were made of plastic (polyethylene) impregnated with barium sulfate so that they would be visible on an x-ray ***(Speroff and Darney, 2017)***.

The first plastic IUD, the *Margulies Coil* or *Margulies Spiral*, was introduced in 1960. This device was somewhat large, causing cramping and bleeding, and had a hard plastic tail, proved risky to the male partner. The *Lippes Loop*, a slightly smaller device with a monofilament tail, was introduced in 1962 and quickly became the most widely prescribed IUD in 1970s ***(Speroff and Darney, 2017).***

The plastic T-shaped IUD was conceived in 1968 by Howard Tatum. The addition of copper to the IUD was suggested by *Jaime Zipper* of Chile in 1969, whose experiments with metals indicate that copper acted locally on the endometrium. It was found that copper-containing devices could be made in smaller sizes without compromising

effectiveness, resulting in fewer side effects such as pain and bleeding ***(Kaufman, 1993)***. T-shaped devices had lower rates of expulsion due to their greater similarity to the shape of the uterus ***(Tatum, 1983).***

In 1970, Dalkon Shield was a whole plastic device with small plastic protrusions around its edges to help it adhere to the endometrium and reduce the risk of expulsion, but after 3 years, a high incidence of pelvic infection was recognized ***(Salem, 2006).***

The first copper IUD had copper wire wound around the straight shaft of the T, the TCu-200c it had 200 mm^2 of exposed copper wire, also known as Tatum-T. Later on, many different models of the copper IUD were developed with higher surface areas of copper, and with effectiveness rates of greater than 99% ***(Treiman et al., 1995).*** TCu380A was the last model developed by Tatum, and the most recommended today. Also there are U-shaped IUDs were developed (such as the Multiload) and 7-shaped IUDs (Gravigard). A frameless IUD called Gynefix was introduced recently ***(Speroff and Darney, 2017).***

Types of IUDs:

Unmedicated IUDs:

The Lippes Loop, made of plastic (polyethylene) impregnated with barium sulfate and had single filament thread

as a tail is still used throughout the world except in the USA ***(Speroff and Darney, 2017)*.**

Medicated IUDs:

The hormone-releasing IUD:

Hormonal IUDs (Mirena, Skyla, and Liletta) act by releasing of levonorgestrel which has a local action on the endometrium making the inside of the uterus fatal to sperms ***(Speroff and Darney, 2017)***. In addition, there is non-contraceptive health benefit of hormonal IUDs is to decrease or prevent menstrual bleeding, and though can be used to treat menorrhagia ***(Bahamondes et al., 2008*).**

Mirena allows a controlled release of 20 mcg of levonorgestrel daily at a constant rate over five years. Skyla has a similar mechanism of action, and is used for three years. Liletta is similar to Mirena in shape and dose of levonorgestrel released daily; and is used for three years ***(Speroff and Darney, 2017)***.

Indomethacin-medicated IUD:

Indomethacin - medicated IUD (active-y-IUD) is composed of 3 layers: The inner layer is made of y-shape stainless steel wire. The middle layer is winded with spiral copper wire of 200-300 mm^2. The outer layer is made of stainless steel wire. Indomethacin dose is 25 mg in: two silastic beads welded at both ends of the horizontal arms and silastic ring in the middle of IUD ***(Wu, 2008)***.