

**The effect of bilateral uterine artery ligation  
versus intermittent clamping of uterine and  
ovarian artery on blood loss during  
abdominal myomectomy  
A randomized controlled trial**

**Thesis**

Submitted for partial fulfillment of the M.D  
in Obstetrics and Gynecology

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**2019**



## Acknowledgments

*First and foremost, I feel always indebted to **Allah**, the **Most Beneficent** and **Merciful** who gave me the strength to accomplish this work,*

*My deepest gratitude to my supervisor, **Prof. Dr. Hesham Mohammed Fathy**, Professor of Obstetrics and Gynecology, Faculty of Medicine – Ain Shams University, for his valuable guidance and expert supervision, in addition to his great deal of support and encouragement. I really have the honor to complete this work under his supervision.*

*I would like to express my great and deep appreciation and thanks to **Assistant Prof. Dr. Haitham El Sabae**, Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine – Ain Shams University, for his meticulous supervision, and his patience in reviewing and correcting this work. I am grateful for his close supervision.*

*I must express my deepest thanks to **Dr. Ahmed Mohamed EL-Kotb**, Lecturer in Obstetrics and Gynecology, Faculty of Medicine – Ain Shams University, for guiding me throughout this work and for the efforts and time he has devoted to accomplish this work. I greatly appreciate his efforts.*

*Special thanks to my **Parents** and all my **Family** members for their continuous encouragement, enduring me and standing by me.*

 *Yasmine Hafez Mohamed Hafez*

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## **List of Abbreviations**

| <b>Abbr.</b> | <b>Full-term</b>                                        |
|--------------|---------------------------------------------------------|
| <b>AUB</b>   | : Abnormal uterine bleeding (AUB)                       |
| <b>BMI</b>   | : Body mass index                                       |
| <b>CIN</b>   | : Cervical intraepithelial neoplasia                    |
| <b>ESHRE</b> | : European society of human reproduction and embryology |
| <b>FDA</b>   | : Food and Drugs Administration                         |
| <b>FIGO</b>  | : International Federation of Gynecology and Obstetrics |
| <b>GnRH</b>  | : Gonadotrophine releasing hormone                      |
| <b>IUD</b>   | : Intrauterine device                                   |
| <b>SD</b>    | : Standard deviation                                    |
| <b>SPSS</b>  | : Statistical package for social science                |

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### **Abstract**

**Background:** Myomectomies are more commonly performed than hysterectomies, mainly due to the fact that patients desire to retain their uterus for psychological, reproductive and cultural reasons even after completing their families. The average volume of blood loss during abdominal myomectomy is 200 to 800 mL. Surgical hemorrhage may result in anemia, hypovolemia, and coagulation abnormalities. **Aim of the Work:** to compare between bilateral uterine artery ligation and intermittent clamping of uterine and ovarian artery on amount of blood loss during abdominal myomectomy. **Patients and Methods:** This study was conducted at Ain Shams University Maternity Hospital on 113 women with symptomatic myomas in the postmenstrual period presented by abnormal uterine bleeding, dull aching lower abdominal pain, dyspareunia, pressure symptoms, progressive abdominal enlargement or pelvic heaviness, diagnosed based on clinical examination and ultrasound scan with pre-operative hemoglobin level above 10gm/dl. **Results:** The preoperative Hb was 11.6 gm % and 11.8gm% for both clamping and ligation one respectively, and post-operative Hb for the groups was 9.4 gm% and 9.2 gm% for the 2 groups respectively. There was no significant difference between both groups regarding postoperative drop of hemoglobin which was 0.8 gm % in the clamping group and 1.1 gm% in the ligation group. Estimated intraoperative blood loss start was significantly fewer among clamping group than among ligation group. Hemoglobin reduction was significantly fewer among clamping group than among ligation group. **Conclusion:** Based on the results obtained by this study, intermittent clamping of uterine and ovarian artery is a preferred approach than bilateral uterine artery ligation on blood loss during abdominal myomectomy.

**Key words:** abdominal myomectomy, bilateral uterine artery ligation, intermittent clamping, uterine, ovarian artery, blood loss, hemorrhage

## Introduction

**L**eiomyomata uteri (fibroids) are tumours of the smooth muscle and the connective tissue of the uterus (*Kwawukume and Emuveyan, 2004*), with more than 50% of women older than 30 years having this benign tumour (*Lowe, 1999*).

The diverse symptomatology of fibroids can be attributed to size, number and location of the tumours. The common symptoms include the presence of an abdominal mass, menorrhagia and pressure effects (*Dilip Visvarathar et al., 2006*).

The standard treatment of symptomatic leiomyomas (myomas or fibroids) is hysterectomy for women who have completed childbearing and myomectomy for women who wish to preserve fertility. Myomectomy can be accomplished by laparotomy, laparoscopy, or hysteroscopy. Blood loss associated with the dissection of huge fibroids renders myomectomy a more technically challenging procedure than hysterectomy. A requirement for transfusion in up to 20% of cases following abdominal myomectomy has been reported in the literature, and in 2% of cases there is need for conversion of myomectomy to hysterectomy (*LaMote et al., 1993*).

Myomectomies are more commonly performed than hysterectomies, mainly due to the fact that patients desire to

retain their uterus for psychological, reproductive and cultural reasons even after completing their families (*Segars, 2014*).

In a study conducted in KSA comparing abdominal myomectomy versus abdominal hysterectomy for symptomatic and big uterine fibroid including 111 patients with symptomatic large fibroids 73 patients (68,5%) underwent myomectomy compared to 38 patients (34,2%) who underwent abdominal myomectomy. hysterectomy, internal iliac a ligation or other procedures were not necessary to control bleeding in patients who underwent myomectomy (*Rouzi et al,2011*).

Blood loss during myomectomy can be intraoperative or postoperative and with hematoma formation (*Iverson et al., 1996*).

Haemorrhage is still a great concern during myomectomy and expectedly, many methods have been reported for reducing such blood loss. The use of Bonney's clamp, intrauterine injection of Vasopressin, preoperative administration of drugs like GnRH, tranexamic acid and misoprostol and the use of a tourniquet have all been reported (*Kongnyuy et al., 2011*).

As most of the blood enters the uterus through the uterine arteries, it was postulated that after occluding the arteries transient uterine ischemia occurs. The hypothesis proposes that soon after occlusion, the blood within the myometrium clots, the myometrium becomes hypoxic, and the

metabolism shifts from oxidative pathways to anaerobic glycolysis. The hypothesis further postulates that hours later the clot within the myometrium lyses and the uterus is reperfused through the collateral arteries (*Lichtinger et al., 2003*).

As regarding uterine artery ligation in cases of abdominal myomectomy, ligation of the uterine vessels was done before myomectomy in all large myomas. Laparoscopic ligation of uterine arteries has been combined with myomectomy, with successful reduction in blood loss (*Sawin et al., 2010*). Most cases of large myomas can be devascularized before myomectomy by laparoscopic intracorporeal suturing of the uterine arteries. The uterine arteries can be ligated by an anterior approach or posterior approach depending on the location of the myoma. In case of lower segment myomas or cervical myomas, the uterine artery can be ligated at its origin from the anterior division of the internal iliac (*Sawin et al., 2010*).

Ligation of the ascending branch of the uterine artery anteriorly is preferred during most laparoscopic myomectomies. The uterovesical fold of the peritoneum is opened and the bladder is pushed down. This moves the ureters laterally and prevents them being included in the suture. The uterine vessels are identified on either side and ligated. No. 1 delayed absorbable sutures are used for ligating the uterine vessels. There can be technical difficulties in approaching the uterine vessels in

the case of large myomas. There can be some venous bleeding if the uterine vein is accidentally punctured. In such cases the suturing is completed and the venous bleed stops by itself. Once the uterines are occluded bilaterally, the myoma turns pale. This devascularizes the myoma and decreases the blood loss during the procedure (*Mahajan et al., 2010*).

As regarding intermittent uterine artery clamping to reduce blood loss, the retroperitoneum is opened through adnexal triangle. After open the para-rectal space, the ureter was dissected carefully using a blunt dissector, bilateral uterine arteries were then identified and clamped by the bulldog clamp temporarily until the uterine incision had been sutured. After reducing the blood flow, the capsule of the myoma was incised and dissected using dissectors and scissors. The bleeding area of the myoma surface was coagulated using bipolar forceps. A screw was inserted into the myoma, and it was removed completely step by step. Finally, the edge of the uterine defect was sutured using V-locks. There was minimal blood loss (<50 ml) during the operation (*Sawin et al., 2010*).

E. Frías Marot et al., found that temporary clipping of the uterine arteries prior to laparoscopic myomectomy is a safe procedure for controlling bleeding without affecting the uterine blood supply nor the ovarian function. (*E. Frías Marot et al., 2011*).

Y. Lee et al., found that temporary clipping of both uterine arteries was safe and feasible, he performed single port access laparoscopic myomectomy with temporary clipping of both uterine arteries in 7 patients. His result showed the median value of Hb drop after surgery on day 1 and hospital stay were 2.3 g/dl (0.3-3.8) and 3 days (2-5) (*Lee et al., 2013*).

Many previous studies have discussed the usage of intermittent clamping of uterine arteries and bilateral uterine arteries ligation in cases of laparoscopic myomectomy which has shown promising results. Although there is gap of knowledge in the literature regarding the usage of the above mentioned techniques in cases of abdominal myomectomy. Our study focused on the comparison between bilateral uterine artery ligation and intermittent clamping of uterine arteries and utero-ovarian anastomosis on blood loss during abdominal myomectomy.

## **Aim of the Work**

**T**he aim of the current study is to compare between bilateral uterine artery ligation and intermittent clamping of uterine and ovarian artery on amount of blood loss during abdominal myomectomy.