The Impact of Electrocoagulation on Ovarian Reserve after Laparoscopic Excision of Ovarian Cysts: Randomization Clinical Trial

Thesis

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By

Zahra Hussien Mohamed Chewai

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Under Supervision of

Prof. Dr. Ahmed Hamdy Nagib

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

Dr. Kareem Mohamed Labib

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

Faculty of Medicine
Ain Shams University
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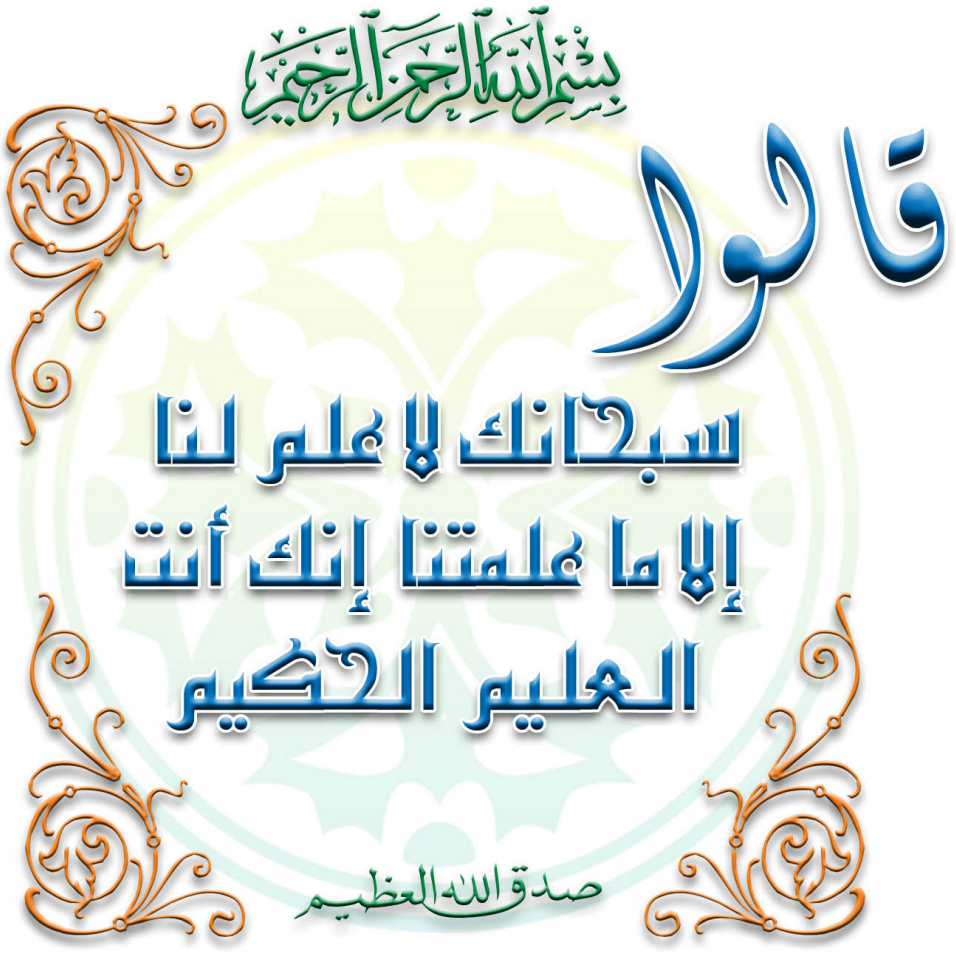

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List of Abbreviations

Abb.	Full term
ACOG	*American College of Obstetricians and Gynecologists*
AFC	*Antral Follicle Count*
AMH	*Anti-Müllerian Hormone*
ANOVA	*Analysis of Variance*
CA	*Cancer Antigen*
CCCT	*Clomiphene Citrate Challenge Test*
EOC	*Epithelial Ovarian Cancer*
FSH	*Follicle-Stimulating Hormone*
hCG	*Human Chorionic Gonadotropin*
HGSC	*High-Grade Serous Carcinoma*
IOTA	*International Ovarian Tumor Analysis group*
ISUOG	*International Society of Ultrasound in Obstetrics and Gynecology*
IVF	*In Vitro Fertilization*
LGSC	*Low-Grade Serous Carcinoma*
OCs	*Oral Contraceptives*
ORS	*Ovarian Remnant Syndrome*
PCOS	*Polycystic Ovary Syndrome*
PID	*Pelvic Inflammatory Disease*
ROS	*Residual Ovary Syndrome*
SGO	*Society of Gynecologic Oncologists*
TOA	*Tubo-Ovarian Abscess*
UKTOCS	*United Kingdom Collaborative Trial of Ovarian Cancer Screening*

Abstract

Introduction: Laparoscopic ovarian cystectomy is currently considered the treatment of choice in women with benign ovarian cysts and has gained increasing acceptance among gynecologic surgeons. However, the safety of this technique in terms of ovarian damage to the operated gonad has recently been questioned. A great deal of evidence supports that the removal of ovarian cysts is associated with injury to the ovarian reserve **Aim:** The aim of the study is to evaluate the effect of bipolar electrocoagulation on ovarian reserve. **Patients and Methods:** Our randomized clinical research trial was conducted in Ain Shams Maternity Hospital that recruited 96 patients admitted to Obstetrics and Gynecology department. **Results:** The study included a total of 96 cases divided into 2 groups, the coagulation group (48 cases) and the non coagulation group (48 cases). The majority of cases (n=92) had chocolate cysts (96%) while only 4 cases had other types of cyst (4%). **Conclusion**: In our study, analysis of data revealed that the using of electrocoagulation during laparoscopic excision of ovarian cysts led to significant decrease in AMH, Ovarian volume and AFC.

Keywords: Ovarian cysts, laparoscopic ovarian cystectomy, electrocoagulation, ovarian reserve.

INTRODUCTION

Laparoscopic ovarian cystectomy is currently considered the treatment of choice in women with benign ovarian cysts and has gained increasing acceptance among gynecologic surgeons ***(Alborzi et al., 2006).*** However, the safety of this technique in terms of ovarian damage to the operated gonad has recently been questioned. A great deal of evidence supports that the removal of ovarian cysts is associated with injury to the ovarian reserve ***(Fedele et al., 2004; Somigliana et al., 2003; Candiani et al., 2005).*** Many of these studies involved patients who required assisted reproduction, and they found that the number both of follicles and retrieved oocytes obtained in the operated gonad during ovarian hyperstimulation was markedly reduced when compared with the contralateral intact ovary. However, most of these studies applied ovarian response to gonadotropin hyperstimulation to measure the ovarian reserve. It has been argued that these patients are not representative of all patients undergoing laparoscopic ovarian cystectomy in terms of ovarian damage because these data were acquired from aggressive gonadotropin stimulation which is thought to be different from a natural menstrual cycle ***(Li et al., 2009).***

On the other hand, because ovarian reserve cannot be measured directly, the evaluation of ovarian reserve is difficult to carry out. The controlled ovarian hyperstimulation in an unselected population of surgical patients for the purpose of

evaluating ovarian reserve is obviously ethically untenable. The serum level of follicle-stimulating hormone (FSH) is a predictor of functional ovarian reserve ***(Toner et al., 1991)***, but its usefulness is limited considering that the vast majority of patients undergo monolateral excision of a cyst and the contralateral intact gonad may completely substitute for reduced function of the operated ovary ***(Lass, 1999).*** Given the well-established role of ultrasound scanning in the diagnosis and follow-up of ovarian cysts, ***Frattarelli et al. (2000)*** and ***Candiani et al. (2005)*** reported that basal antral follicle number and mean ovarian diameter could be used as indicators of ovarian reserve. ***Engmann et al. (1999)*** found that the value of ovarian stromal blood flow velocity was an initial marker of ovarian reserve before the change of FSH level and ovarian volume.

AIM OF THE WORK

The aim of the study is to evaluate the effect of bipolar electrocoagulation on ovarian reserve.

Research question:

In women planned to undergo laparoscopic ovarian cystectomy, does electrocoagulation have negative impact on ovarian reserve?

Research hypothesis:

In women planned to undergo laparoscopic ovarian cystectomy, electrocoagulation may have negative impact on ovarian reserve.

Chapter 1

OVARIAN CYST

Approach to the patient with an adnexal mass:

A mass in the adnexa may be symptomatic or discovered incidentally on pelvic examination or imaging. There are many different types of adnexal masses. The type of mass is identified with pelvic imaging, use of biomarkers, and/or surgical exploration and pathologic evaluation ***(Levine et al., 2010).***

Most adnexal masses arise from the ovary or fallopian tube. However, other gynecologic structures may give rise to an adnexal mass, including the mesovarium or mesosalpinx (eg, paratubal cysts). Uterine leiomyomas may protrude toward the adnexa and be palpated or visualized as an adnexal mass. In addition, adnexal masses may arise from other proximal structures, including the urinary tract (eg, bladder diverticulum), bowel (eg, appendiceal abscess, diverticular abscess, bowel neoplasm), or pelvic connective tissue (eg, peritoneal cyst) or nerves (nerve sheath tumor) ***(Levine et al., 2010).***

Some adnexal masses require immediate attention; these include ectopic pregnancy, adnexal torsion, a ruptured ovarian cyst with hemorrhage, or a tubo-ovarian abscess ***(Levine et al., 2010).***

A serious concern when an adnexal mass is discovered is the possibility that it is malignant. The differential diagnosis of benign and malignant neoplastic masses is discussed below. A

consensus paper from the Society of Radiologists in Ultrasound in 2010 indicated that transvaginal ultrasound, supplemented by transabdominal ultrasound, was the best technique for imaging and characterizing an adnexal cyst ***(Levine et al., 2010).***

The first international consensus report on adnexal masses reviewed the current state of the science and reported recommendations for assessment and management of adnexal masses. This report described two approaches to the assessment of adnexal masses. The first is using pattern recognition seen on ultrasound to create a simple risk assessment stratification profile. The second approach is to use risk prediction models with an emphasis on the international ovarian tumor analysis group (IOTA) Simple Rules. There are also recommendations for indeterminant masses with regard to when to refer to an expert sonologist and gynecologic oncologist ***(Glanc et al., 2017).***

Gynecologic Tract Masses:

There are many different types of adnexal masses. The likely etiology of an adnexal mass differs by age and reproductive status. This is because some masses are stimulated by reproductive hormones ***(You et al., 2005).***

Ovarian neoplasms (benign and malignant) account for approximately 1% of all tumors in children and adolescents. Most ovarian masses are physiologic or benign neoplasms; fewer than 5% of ovarian cancers occur in this age group ***(You et al., 2005).***