Electrosurgical Unipolar Vessel Sealing Versus Purohit Technique in Vaginal Hysterectomy (A Pilot Randomized Clinical Trial)

Thesis

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By

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Alaa Mohamed Atef Karim El-Din

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List of Abbreviations

Abbr.	Full-term

A.C. : Alternating electrical current

AAGL : American Association of Gynecologic Laparo-scopists

ACOG : American College of Obstetricians and Gynaecologists'

AD : Anno Domini

ANOVA : Analysis of variance

BMI : Body mass index

BVS : Biclamp vessel sealing

BVSS : Bipolar vessel sealing systems

D.C. : Direct current

DUB : Dysfunctional uterine bleeding

EBVS : Electrosurgical bipolar vessel sealing system

ESU : Electrosurgical units (ESU)

FSH : Follicle stimulating hormone

KHz : Kilo hertz

LASER : Light amplification and stimulated emission of radiation

LEEP : Loop Electrosurgical Excision Procedure

NICE : National Institute of Clinical Excellence

NSAIDs : Non steroidal anti-inflammatory

RCT : Randomized controlled trial

SD : Standard deviation

UK : United Kingdom

USA : United States of America

VH : vaginal hysterectomy

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Abstract

Background: Literature reviews and meta-analysis show that vaginal hysterectomy should be performed in preference to abdominal hysterectomy, where possible as it has benefits; quicker return to normal activities, fewer complications, shorter operative time, less blood loss, and a shorter stay in hospital. Also, it is preferred to laparoscopic-assisted vaginal hysterectomy because of fewer bladder or ureteric damage as well as a shorter operating time and learning curve. **Aim of the Work:** To compare the between using unipolar electrocautery versus Purohit technique in vaginal hysterectomy as regards operative time. **Patients and Methods:** This pilot prospective randomized clinical trial was conducted at Ain Shams University Maternity and Women's Hospital during the period from June 2016 to February 2018. This study included patients presenting to the outpatient gynecologic clinic of Ain Shams University Maternity and Women's Hospital and planned to have vaginal hysterectomy for benign cause. **Results:** Both total operative time and pedicle securing time were significantly longer in the Purohit technique group compared to the unipolar electrocautery group (**P value is <0.001). Conclusion:** Using unipolar electrocautery significantly reduces total operative time than using bipolar electrocautery without increasing rate of complications nor does it cause specific type of complications provided that special precautions are taken to avoid thermal effect on nearby structures. **Recommendations:** Using unipolar electrocautery is recommended by well trained hands in suitable patient and should be offered for training by other surgeons of different levels to judge learning curve. Further studies with inclusion of patients having larger sizes of uteri using the same technique. Further settings with higher cautery up to 50W were found to be safe for further analysis.

Key words: unipolar electrocautery, Purohit technique, vaginal hysterectomy

Introduction

Hysterectomy is the most frequently performed major gynecological operation in the world. For benign situations, hysterectomy is most usually done using either the abdominal or vaginal method. Nevertheless, a small proportion of women with benign conditions undergo laparoscopic hysterectomy, which was introduced in the 1980s in the United States ***(Ghaffar et al., 2010).***

The American College of Obstetrics and Gynecology recommended the vaginal route in case of uteri weighing 280gm or less which is about 12 weeks size ***(Kim et al., 2010).***

The experience of the surgeon and the knowledge of using surgical techniques as morcellation, bisection and myomectomy can overcome difficulties in dealing with large uteri vaginally ***(Teoh, 2001).***

Vaginal hysterectomy is the method of choice for gynecologists who carry out hysterectomies. Undertaking this procedure regularly will enhance the gynecologist's level of skill and enable conditions such as ovarian cysts, broad ligament fibroids and other adnexal pathology to be dealt with vaginally during hysterectomy surgery without abdominal invasion ***(Sheth et al., 2011).***

Vaginal hysterectomy should be performed in preference to abdominal hysterectomy, where possible. Vaginal hysterectomy means quicker return to normal activities, fewer complications, shorter operative time, less blood loss, and a shorter stay in hospital compared to abdominal hysterectomy ***(Nieboer et al., 2010; Chen et al., 2014; Aarts et al., 2015).*** This is endorsed in the National Institute of Clinical Excellence (**NICE**) guidelines on heavy menstrual bleeding and in a meta-analysis review of the Cochrane database. Also, vaginal hysterectomy was preferred to laparoscopic-assisted vaginal hysterectomy because of fewer bladder or ureteric damage as well as a shorter operating time and learning curve ***(Johnson et al., 2005).***

The American Association of Gynecologic Laparo-scopists (**AAGL**) highlight that hysterectomy for benign uterine disease should be performed either vaginally or laparoscopically. This affirms the American College of Obstetricians and Gynaecologists' (**ACOG**) statement that the vaginal approach should be primary whenever feasible due to better patient outcomes and fewer complications than laparoscopic or abdominal surgery.

The overall incidence of major complications in vaginal hysterectomy is 4%, improvements can be done to reduce the complication rate in vaginal hysterectomy specially by carrying

out careful patient selection, proper and thorough pre-operative assessment, expert surgical techniques and vigilant post-operative care ***(Ghaffar et al., 2010).***

Despite this, there is a reluctance towards VH due to the challenging surgical technique with limited access to deep vascular pedicles making haemostasis and suture ligation potentially problematic ***(Kovac et al., 2004).***

Bipolar vessel sealing systems (BVSS) are proven to be safe, easy and efficacious with possible advantages over conventional methods, namely less post-operative pain, reduced blood loss, shorter operative time and hospital stay. Where previously, it was difficult to suture a pedicle deep within the pelvis or in circumstances where the introitus was narrowed or where there was no uterine descent, the bipolar coagulation forceps negated this and allowed a general gynaecologist to perform vaginal hysterectomy with greater ease and safety ***(Levy and Emery, 2003; Hefni et al., 2005; Cronje and Coning, 2005; Chia et al., 2007; Elhao et al., 2009; Lakeman et al., 2012 and Agrawal et al., 2014).***

Electrosurgical bipolar vessel sealing systems have been developed to seal large tissue bundles and blood vessels up to 7 mm in diameter. By using this technique, only one clamp has to be inserted through the vagina to secure the vessels and cut the tissue, instead of one clamp and one scissors. This might

shorten the operation duration as the result of a limitation in surgical steps ***(Lakemam et al., 2012).***

The main obstacles in using electrosurgical bipolar vessel sealing system (EBVS) are the relatively high cost and unavailability in many centers. A much easier alternative, more feasible and less costly approach has been described by Purohit ***(Purohit, 2003).*** In his technique, a right-angle long forceps with bipolar electro-coagulation was used in order to have the advantage of avoiding inaccessibility of the parauterine space with minimal use of large clamps.

In **2003, Purohit** performed a prospective study on 214 women with benign disease of the uterus without prolapse, including cases with relative contraindications for vaginal hysterectomy as cases with endometriosis and uteri above 20 weeks size, the technique was found to be easy, safe and effective. Vaginal hysterectomy was successfully completed in 213 (99.53%) cases, with one failure (0.46%) which needed laparoscopic assistance. Vaginal salpingo-oophorectomy was completed in all indicated cases. So many abdominal and laparoscopic hysterectomies could be avoided by this technique.

Following The Work of Purohit, another multicenter, two-arm, single-blind, RCT to compare Biclamp vessel sealing (BVS) forceps against conventional suture ligation