

# Does Laparoscopy Safely Improve Technicity for Complex Hysterectomy Cases?

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## Abstract

**Objective:** The minimally invasive surgical (MIS) approach to hysterectomy (vaginal or laparoscopic), when compared with laparotomy, results in shorter length of stay, fewer minor and major complications, and quicker return to normal activity. The complexity of the hysterectomy procedure or pathology may affect the success of an MIS approach. This study examined the indications, complications, and outcomes of all hysterectomies performed, irrespective of the severity of pathology or patient habitus, in a Canadian tertiary level gynaecologic surgical referral service.

**Methods:** We performed a retrospective chart review of all hysterectomies performed by a single surgeon between September 2007 and June 2011, noting indications, complications, and outcomes. One-way analysis of variance was used to calculate the influence of various factors across surgery types. Significance was set at  $P < 0.05$  for all tests.

**Results:** A total of 305 cases were included; 291 of these (95.4%) were managed through an MIS approach, providing a technicity rate of 95.4%. Mean patient age was 45.5 years, and mean BMI was 28.9. The main indicators for surgery were fibroids (42.0%), pain (38.4%), and heavy menstrual bleeding (37.4%). Eighty-one percent of cases were tertiary referrals. Of the laparoscopic cohort, endometriosis was moderate-severe in 61.2% of patients. Mean length of stay was 1.14 days, mean uterine weight was 277.6 g, and mean estimated blood loss was 179 mL.

**Conclusion:** This retrospective study of a tertiary level referral gynaecologic service suggests that complex hysterectomy may be effectively and efficiently managed through an MIS approach.

**Key Words:** Laparoscopy, hysterectomy, technicity, complications

Competing Interests: None declared

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## Résumé

**Objectif :** Le recours à une approche chirurgicale à effraction minimale (CEM) aux fins de la tenue d'une hystérectomie (par voie vaginale ou laparoscopique), par comparaison avec le recours à une laparotomie, entraîne une diminution de la durée de l'hospitalisation et du nombre de complications mineures et majeures, ainsi qu'une accélération du retour aux activités normales. La complexité de l'hystérectomie ou de la pathologie pourrait affecter la réussite du recours à une approche CEM. Cette étude s'est penchée sur les indications, les complications et les issues de toutes les hystérectomies menées, sans égard à la gravité de la pathologie ou à l'habitus de la patiente, au sein d'un service canadien d'orientation en chirurgie gynécologique de niveau tertiaire.

**Méthodes :** Nous avons mené une analyse rétrospective des dossiers portant sur toutes les hystérectomies menées par un même chirurgien entre septembre 2007 et juin 2011, en prenant note des indications, des complications et des issues. Une analyse de variance à un critère de classification a été utilisée pour calculer l'influence de divers facteurs sur tous les types de chirurgie. Le niveau de signification a été établi à  $P < 0,05$  pour tous les tests.

**Résultats :** Au total, 305 cas ont été inclus; 291 de ces cas (95,4 %) ont été pris en charge au moyen d'une approche CEM, offrant ainsi un taux de technicité de 95,4 %. L'âge moyen des patientes était de 45,5 ans et l'IMC moyen était de 28,9. Les fibromes (42,0 %), la douleur (38,4 %) et la présence de règles abondantes (37,4 %) constituaient les principaux indicateurs du recours à la chirurgie. Les orientations tertiaires représentaient 81 % des cas. Au sein de la cohorte « laparoscopie », l'endométriose allait de modérée à grave chez 61,2 % des patientes. La durée moyenne de l'hospitalisation était de 1,14 jour, le poids utérin moyen était de 277,6 g et la perte sanguine estimée moyenne était de 179 ml.

**Conclusion :** Cette étude rétrospective ayant porté sur un service d'orientation en chirurgie gynécologique de niveau tertiaire semble indiquer que les cas complexes d'hystérectomie pourraient être pris en charge de façon efficace au moyen d'une approche CEM.

## INTRODUCTION

Nieober et al.<sup>1</sup> (2009) and the AAGL<sup>2</sup> (2011) assert that the optimal route of hysterectomy for benign gynaecologic disease is a minimally invasive surgical approach that may include a vaginal or laparoscopically assisted technique. The MIS approach, when compared with laparotomy, results in shorter length of stay, fewer minor and major complications, and a quicker return to normal activity.<sup>3-5</sup> The complexity of the hysterectomy procedure or the associated pathology are factors that may affect the success of an MIS approach. In addition, surgical outcomes and approaches are known to be influenced by the surgeon's experience.<sup>3,6-8</sup> While much has been published on outcomes of hysterectomy performed using an MIS technique, there is a need to determine how the approach in complex tertiary level gynaecology cases is affected by the severity of pathology and by patient factors such as high BMI. Many series in the literature exclude complex cases, such as those involving deep endometriosis or large fibroid uteri, which limits the extrapolation of outcomes.<sup>1,4,5,6,8</sup> Furthermore, there may be significant differences in outcome depending on the surgeon's experience.<sup>3,9,10</sup>

We conducted this retrospective chart review to examine the indications for and complications and outcomes of all hysterectomies performed by a single surgeon, irrespective of the severity of pathology or patient habitus. The study cohort was derived from a Canadian tertiary level gynaecologic surgical referral service.

## METHODS

We performed a chart audit of all hysterectomies performed by a single surgeon between September 2007 and June 2012. The study cohort was drawn from an academic tertiary referral practice (> 80% of referrals coming from specialists) providing management of women with complex gynaecologic pathology. A total of 305 cases requiring hysterectomy for benign disease were included in the sample. We excluded cases associated with malignancy, abortion, or pregnancy.

Currently practised surgical approaches to hysterectomy include abdominal hysterectomy via a laparotomy or a mini-laparotomy, vaginal hysterectomy, total laparoscopic hysterectomy, laparoscopically assisted vaginal hysterectomy,

and laparoscopically assisted subtotal hysterectomy. In this study, mini-laparotomy was defined as laparotomy using a 4 to 6 cm suprapubic transverse incision. Standardized analgesia, administration of antibiotics, anaesthetic care, and advice for postoperative care were provided. Conversions from laparoscopy to mini-laparotomy or laparotomy were documented. All surgical procedures were performed by the same surgeon (S.S.), assisted by a clinical fellow in minimally invasive gynaecology, a resident, a staff gynaecologist, or a general surgeon.

Data were obtained through office and online health records, and were coded by a clinical fellow and research assistant. Variables included patient characteristics, surgical history, preoperative diagnosis, postoperative diagnosis, length of stay, operating room time, complications, estimated blood loss, pathology, and uterine weight.

The technicity rate was defined as the number of hysterectomies performed by an MIS approach (laparoscopic and vaginal hysterectomy) divided by the total number of hysterectomies performed.<sup>3</sup> Patient characteristics included age, BMI, and the number of previous abdominal and/or pelvic surgical procedures. Previous abdominal and/or pelvic surgery was recorded whether related to the present surgical indication or not. Concurrent procedures included excision of endometriosis, lysis of adhesions, bilateral salpingo-oophorectomy, unilateral salpingo-oophorectomy, cystectomy, salpingectomy, appendectomy, pelvic floor repair, ureterolysis, morcellation (performed vaginally, at minilaparotomy, or by mechanical morcellator), and internal iliac artery ligation. Surgical outcomes included LOS, uterine weight, operative time (defined as the time from first operative incision to closure), and EBL. Complications during surgery, immediately postoperatively, and during subsequent follow-up visits were recorded, as were all re-admissions. Major and minor complications were classified as in previous reports.<sup>7,11</sup>

One-way analysis of variance was used to calculate the significance of various factors across surgery types. All data were analyzed using SPSS software (IBM Corp., Armonk NY). Significance was set at  $P < 0.05$  for all tests.

Ethics approval for the study was obtained from The Ottawa Hospital Research and Ethics Board.

## RESULTS

Of the 305 cases reviewed, 291 were managed through an MIS approach. This provided a technicity rate of 95.4%, with 219 total laparoscopic hysterectomies, 13 laparoscopically assisted vaginal hysterectomies, 33 laparoscopically assisted

## ABBREVIATIONS

EBL	estimated blood loss
LOS	length of stay
MIS	minimally invasive surgical

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