Evaluation of Total Laparoscopic Hysterectomy With and Without the Use of Barbed Suture

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Abstract

Objective: To evaluate the outcome of total laparoscopic hysterectomy with and without the use of barbed suture.

Methods: We conducted a retrospective study among patients who underwent total laparoscopic hysterectomy between February 2008 and August 2012. The parameters evaluated were age, BMI, operative time, hospital stay, pre- and postoperative hemoglobin levels, uterine weight, intraoperative blood loss, and postoperative complications.

Results: A total of 202 women underwent total laparoscopic hysterectomy; barbed suture (V-Loc) was used in 63 women, and polydioxanone (PDS) in 139. Estimated blood loss, difference in hemoglobin level before and after surgery, operative time, and the duration of hospital stay were comparable between the two groups of patients. The incidence of postoperative fever was higher in the V-Loc group than in the PDS group ($P = 0.003$). Multiple linear regression analysis showed that the incidence of postoperative fever was related to BMI ($P = 0.02$, $r = 0.22$) and estimated blood loss ($P = 0.004$, $r = 0.28$) and not to age, operative time, or uterine weight.

Conclusion: The use of barbed suture to close the vaginal vault after laparoscopic hysterectomy, compared with standard suture, results in similar operative time, blood loss, and duration of hospital stay. The use of barbed suture is technically less demanding than the use of regular sutures.

Résumé

Objectif : Évaluer l'issue de l'hystérectomie laparoscopique totale, avec ou sans utilisation de sutures barbelées.

Méthodes : Nous avons mené une étude rétrospective auprès de patientes ayant subi une hystérectomie laparoscopique totale entre février 2008 et août 2012. Les paramètres évalués étaient l'âge, l'IMC, la durée opératoire, le séjour à l'hôpital, les taux d'hémoglobine préopératoire et postopératoire, le poids utérin, la perte sanguine peropératoire et les complications postopératoires.

Résultats : Au total, 202 femmes ont subi une hystérectomie laparoscopique totale; une suture barbelée (V-Loc) a été utilisée chez 63 femmes, tandis qu'une suture polydioxanone (PDS) a été utilisée chez les 139 autres femmes. La perte sanguine estimée, la différence entre le taux d'hémoglobine constaté avant la chirurgie et celui qui est constaté après celle-ci, la durée opératoire et la durée du séjour à l'hôpital étaient comparables dans les deux groupes de patientes. L'incidence de la fièvre postopératoire était plus élevée au sein du groupe « V-Loc » qu'au sein du groupe « PDS » (P = 0,003). L'analyse de régression linéaire multiple a indiqué que l'incidence de la fièvre postopératoire était liée à l'IMC (P = 0,02, $r = 0,22$) et à la perte sanguine estimée (P = 0,004, $r = 0,28$), mais non à l'âge, à la durée opératoire ou au poids utérin.

Conclusion : L'utilisation d'une suture barbelée pour fermer le dôme vaginal à la suite d'une hystérectomie laparoscopique donne lieu à des résultats semblables à ceux de l'utilisation d'une suture standard en ce qui concerne la durée opératoire, la perte sanguine et la durée du séjour à l'hôpital. L'utilisation d'une suture barbelée est moins exigeante sur le plan technique que l'utilisation de sutures régulières.

Key Words: Barbed suture, laparoscopic hysterectomy, vaginal vault, V-Loc suture

Competing Interests: See Acknowledgement.

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INTRODUCTION

Hysterectomy is one of the most common gynaecologic operations performed among females aged 18 to 44 years. In the United States, more than 600 000 hysterectomies are performed each year.[1] Hysterectomy is most commonly performed for the treatment of uterine fibroids, endometriosis, abnormal uterine bleeding, and gynaecologic malignancy,[1] and it is usually performed by laparotomy. Depending on the surgeon's preference and expertise, laparoscopic hysterectomy is an alternative approach. It is associated with less intraoperative blood loss, shorter hospitalization, and reduced hospital cost than hysterectomy performed by laparotomy,[2] although suturing the vaginal cuff during laparoscopic hysterectomy can be challenging.[2]

Barbed suture is a new class of suture material that has been used in different surgical specialties since 2009. It is approved by the United States Food and Drug Administration and by Health Canada. V-Loc suture (Covidien, Mansfield, MA) is a form of barbed suture with unidirectional, shallow barbs with circumferential distribution. It has a needle at one end and a loop at another. These barbs and loop serve to anchor the tissue without knots. Use of barbed suture leads to a shorter time required for suturing.[3] The tensile strength of V-Loc suture is 80% at one week after surgery, 75% at two weeks, and 65% at three weeks; the suture is totally absorbed by six months.[4]

Bidirectional suture (Quill, Angiotech Pharmaceutical Inc, Vancouver, BC) is another type of barbed suture. It is a knotless suture with one needle at each end and barbs facing in opposite directions from the suture midpoint.[5] The tensile strength of Quill suture is 80% at four weeks after surgery, and 40% at six weeks. Like the V-Loc suture, it is completely absorbed by six months after surgery.[6] This type of barbed suture is not used at McGill teaching hospitals.

Because of its hemostatic property and ease of use, we have been using V-Loc suture for closure of the vaginal vault at laparoscopic hysterectomy since June 2011. The purpose of our study was to evaluate the outcome of total laparoscopic hysterectomy with and without the use of barbed suture.

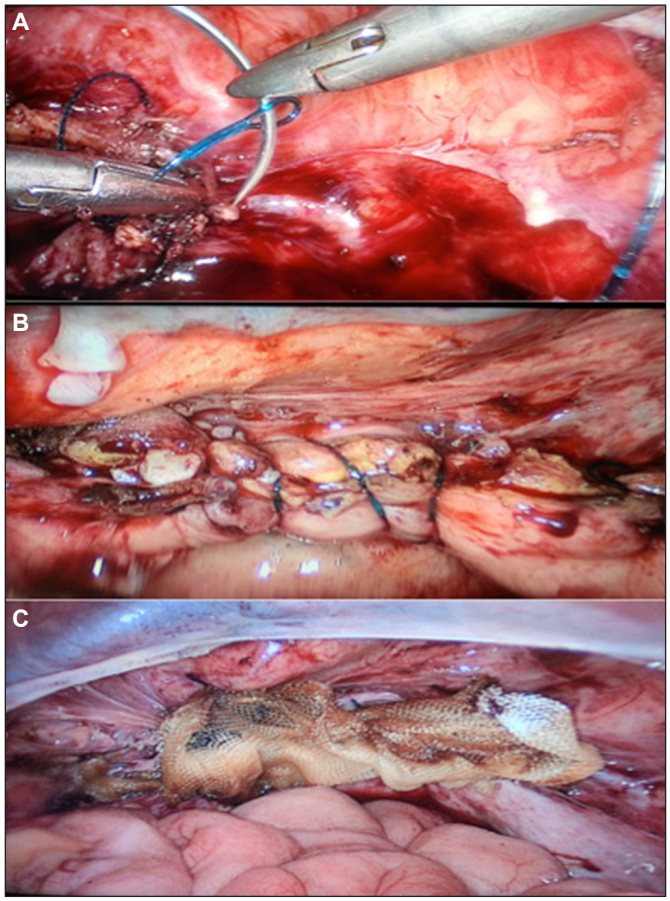
MATERIALS AND METHODS

We conducted a retrospective study of 245 patients who underwent total laparoscopic hysterectomy between February 2008 and August 2012 at McGill University Health Centre. Patients who underwent laparotomy, laparoscopic subtotal hysterectomy, robotic assisted laparoscopy, additional surgical procedures besides hysterectomy, and those with an incomplete medical file were excluded from the study.

Data retrieved included age, BMI, type of procedure, any additional procedures, operative time, hospital stay, pre- and postoperative hemoglobin levels, uterine weight and volume, intraoperative blood loss, and postoperative complications.

Laparoscopic hysterectomy was performed in the usual manner. From February 2008 to June 2011, closure of the vaginal vault was performed using three figure-of-eight sutures of 0-polydioxanone (PDS) suture (Ethicon Inc., Somerville NJ) that were tied intracorporeally. After June 2011, we used V-Loc continuous running suture to close the vaginal vault, and we covered the vaginal vault with a sheath of oxidized regenerated cellulose (Surgicel, Ethicon Inc., Somerville NJ) (Figure). The use of the cellulose sheath was

Closure of the vaginal vault at laparoscopic hysterectomy. (A) insertion of the suture into the loop after the first bite at the right vaginal angle, (B) the vaginal vault has been closed with continuous running suture of V-Loc, (C) a sheath of oxidized regenerated cellulose (Surgicel) was used to cover the closed vaginal vault



to prevent adhesions to the sutures that might cause bowel obstruction.[7,8] In this study, all suturing was performed by a single surgeon (T.T.). All blood was suctioned from the pelvis and measured and recorded immediately after surgery.

The Shapiro Wilks test was used to evaluate the distribution of the data. Comparisons were analyzed using Student *t* test or Mann–Whitney *U* test when appropriate. Proportions were compared with chi-square test or Fisher exact test. A *P* value of less than 0.05 was considered significant.

The Research and Ethics Board of McGill University Health Centre approved the study.

RESULTS

Of a total 245 patients who underwent laparoscopic hysterectomy, 202 cases were included for analysis and 43 cases were excluded. Of these excluded cases, 25 had