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Full length article

Efficiency of using a Foley catheter as a pelvic drain in vaginal hysterectomy

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ABSTRACT

Objectives: Vaginal hysterectomy can be associated with a significant risk of vault haematomas with consequent postoperative morbidity. The aim of this study was to assess the use of a Foley Catheter as a vaginal drain in premenopausal women undergoing a vaginal hysterectomy and the impact on different outcomes including development of vault haematoma, length of hospital stay, antibiotics usage, readmissions to the hospital and febrile morbidity in the immediate postoperative period.

Study design: This study was conducted at a tertiary teaching hospital and was a retrospective cohort study of women undergoing a vaginal hysterectomy. The study compared 52 women in the study group with a Foley catheter drain to 51 age matched controls without a drain who underwent surgery for similar indications. Outcomes were compared using the Chi square test and student *t*-test.

Results: Comparing women with a drain to those without demonstrated a statistically significant difference with worse outcomes for all parameters in women without a drain: evidence of vault haematomas (0 vs 8; p = 0.0025); length of hospital stay over 2 days (3 vs 15; p = 0.001); discharge with antibiotics for vault haematomas (5 vs 0; p = 0.028) and readmission rates (0 vs 7; p = 0.005). There was no statistical difference in the number of women with temperatures over 38 °C (4 vs 2; p = 0.3) in either group.

Conclusion: A Foley catheter used as a pelvic drain following a vaginal hysterectomy reduces postoperative complications associated with vault haematomas with shorter hospital stay, lower antibiotic usage and lower readmission rate.

Introduction

Hysterectomy is the surgical removal of the uterus and is one of the commonest gynaecologic operations performed in the UK with the vaginal route having the lowest morbidity [1]. Millions of procedures are performed annually throughout the world [2,3].

Approximately 90% of hysterectomies are performed for benign conditions, such as fibroids/adenomyosis causing abnormal uterine bleeding [4]. There have been various techniques for conservative management of heavy menstrual bleeding described [5]. However, a significant proportion of women will eventually choose to have a hysterectomy as a permanent treatment technique.

The vaginal route of hysterectomy has been recommended as the method of choice whenever possible. This is because it results in a quicker return to normal activities than abdominal hysterectomy with no evidence of a difference between them for other main outcomes. Although laparoscopic hysterectomies also result in a quicker return to normal activities they have a greater risk of damaging the bladder or ureter [1].

Vaginal Hysterectomy is however associated with a significant risk of vault haematomas: 25–44% [6,7] and this can lead to significant postoperative morbidity including longer hospital stay, return to theatres, readmission, need for antibiotics and post-operative febrile morbidity [8].

Considering the large number of vaginal hysterectomies being done in the UK, it is worthwhile investigating the use of pelvic drains to reduce postoperative morbidity related to the development of haematomas. Surgical drains are used in a wide variety of different types of surgery with the intention to decompress or drain either fluid or air from the area of surgery. It is of the authors' opinion that this is especially significant in premenopausal women with more vascular pedicles and higher chances of haematoma formation.

The aim of this study was to assess the use of a Foley catheter as a vaginal drain in premenopausal women undergoing a vaginal hysterectomy and the impact on different outcomes including development of vault haematoma, length of hospital stay,

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antibiotics usage, readmissions to the hospital and febrile morbidity in the immediate postoperative period (Table 1).

Methods

This was a retrospective cohort study conducted in the Urogynaecology department at a Tertiary teaching hospital. All women underwent surgery between 2011–2016. The study group consisted of 52 consecutive pre-menopausal women who had a pelvic drain (Foley Catheter No 18) inserted during vaginal hysterectomy compared to 51 age matched controls who underwent a vaginal hysterectomy for similar indications but did not have a drain inserted. It is the practice of the senior author (SJ) to insert a drain in premenopausal women undergoing a vaginal hysterectomy. A Foley catheter has the advantage of being self-retaining in contrast to a Robinsons drain, and therefore does not fall out when the patient mobilised the morning after surgery. Hence it was SJ's preference to use this device as a vaginal drain inserting it at the end of the hysterectomy and prior to closure of the vaginal cuff. The drain was left in till the second postoperative day which was the usual practice at this unit for patient discharge. This was to allow the patient to mobilise and thereby allow drainage of any collection. All patients who had a Foley underwent surgery by the same surgeon (SJ). All patients without a drain underwent surgery by other surgeons in the same department but who did not routinely use a drain in their practice. The technique for performing the vaginal hysterectomy was similar by all surgeons. All cases were performed either by a Consultant as the main operator or with a Consultant supervising a trainee to perform the procedure. None of the cases were performed by trainees independently.

The hospital policy regarding length of stay following surgery was to discharge women on the second postoperative day after their hysterectomy unless there was a clinical indication for them to stay in.

Consecutive premenopausal women who had a vaginal hysterectomy for benign gynaecological reasons and who had a Foley catheter inserted vaginally during the time period were included in the study. They were compared with online generated, randomly selected age matched premenopausal women who did not receive a drain but were operated for similar reasons by alternative surgeons during the same period. All women had a single dose of perioperative antibiotics at start of surgery as per hospital protocol and received thromboprophylaxis 6 h after surgery during their inpatient hospital stay as per protocol.

Outcomes were collected by review of the patient notes as well as telephone interviews conducted to find out if they were readmitted to a different hospital or if they needed antibiotics for vault haematomas by their GP. The diagnosis of a vault haematoma was based on ultrasound diagnosis. Women who received antibiotics for a recognised UTI or non-surgical cause were excluded from this analysis.

As this was a retrospective study a post-hoc sample size calculation was done and it was identified that to have an 80% power of detecting the mean difference in outcomes between the Foley and non-Foley group as statistically significant at the 5% (two-sided) level would require 45 patients per group (90 in total).

Formal ethical approval was not required as this was conducted as a Service evaluation project. The study was approved by the Clinical Effectiveness Unit in Sheffield Teaching Hospitals.

The data was anonymised and entered in an excel spreadsheet. Statistics were done using Pearson's Chi square test and unpaired *t*-test. A p value of < 0.05 was considered as significant.

Results

As this study was conducted in the Urogynaecology department, the most common reason for hysterectomy was prolapse in both groups (84.6% vs 78.4%) followed by heavy menstrual bleeding (15.4% vs 21.6%). Both these characteristics were not statistically different. All of the surgeries were vaginal hysterectomies with or without anterior or posterior repairs (Table 2). A vaginal hysterectomy with/without another procedure (anterior repair, posterior repair and/ or sacrospinous fixation) was done in all the women studied in both groups. Both groups included women undergoing a primary pelvic floor repair/ first time pelvic floor surgery.

The demographic features of the two groups were similar including ethnicity. Results are shown in Table 3. The expected blood loss in the drain vs no drain group was 122 mls vs 233 mls.

The drainage from the Foley ranged from 10 to 150 ml. Vault haematomas were detected when an ultrasound scan was done either due to delayed recovery (4 out of 8 women), excessive pain (2/8), diarrhoea (1/8) or temperatures over 38 °C (1/8).

There was a statistically significant difference in the number of women with vault haematomas without the drain compared to those with the drain (8 vs 0; p = 0.0025), hospital stay of over 2 days (15 vs 3; p = 0.001), discharge with antibiotics for vault haematomas (0 vs 5; p = 0.028) and readmission rates (7 vs 0; p = 0.005). There was no statistical difference in the number of women with temperatures over 38 °C (2 vs 4; p = 0.3) in either groups.

Discussion

Principal findings

A Foley catheter used as a pelvic drain after a vaginal hysterectomy reduces postoperative morbidity associated with pelvic haematoma formation. There was a significant reduction of vault haematomas, length of hospital stay, antibiotics usage for vault haematomas and readmission rates in women who had a drain inserted at the time of their hysterectomy. There was no statistically significant difference seen in the number of women with temperatures over 38 °C in both groups.

Strengths and weaknesses of the study

This study is unique in that it looks at the premenopausal group of women, where the complication rate is expected to be higher due to greater vascularity as well as intraoperative and postoperative bleeding. This is relevant as current practice in the UK is to administer perioperative antibiotics but the evidence regarding the use of drain in these women remains controversial. Though it is a small study, the post-hoc sample size calculation demonstrates it was adequately powered to answer the research question (Table 4).

Table 1
Indications for Hysterectomy.

Reason for Hysterectomy	With Foley catheter (n = 52) [%]	Without Foley Catheter (n = 51) [%]	p value
Prolapse	44 [84.6]	40 [78.4]	0.29
Heavy menstrual bleed	8 [15.4]	11 [21.6]	