Hysterectomy for Benign Gynaecological Disease: A Comparison of Methods

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ABSTRACT

Hysterectomy is the most commonly performed major gynaecological surgery in the United States (US) and the United Kingdom (UK), with 30 percent of American women having undergone the procedure by the age of 60 years. In the UK, 47 percent of hysterectomies are performed by the abdominal route, 30 percent vaginal route and three percent laparoscopically. Vaginal hysterectomy, laparoscopically-assisted vaginal hysterectomy and total laparoscopic hysterectomy are less invasive methods which confer decreased burden of procedure, reduced recovery time along with improved convalescence and cosmesis compared with abdominal hysterectomy. However, overall operative complication rates and severe post-operative complications are greater with the laparoscopic technique compared with abdominal hysterectomy. It has been suggested that improved surgical skill may decrease higher complication rates and thus make laparoscopically-assisted vaginal hysterectomy a worthy alternative to abdominal hysterectomy.

Hysterectomy is the most commonly performed major gynaecological surgery in the United States (US) and the United Kingdom (UK). Thirty percent of American women have undergone the operation by the age of 60 years. In almost 90 percent of women having a hysterectomy the surgery is carried out for benign disorders, particularly fibroids, which alone are the most common indication for hysterectomy in the UK.

Hysterectomy remains the definitive cure for most causes of unacceptable uterine bleeding and rates highest in satisfaction scores compared with other forms of treatment. It is a well-established and extremely safe operation, with an overall visceral damage rate being 0.5 to 2 percent and an overall mortality rate of 0.5 to 2 per 1000.[1] Hysterectomy has developed over the years from a procedure involving an extensive abdominal incision and prolonged convalescence, such as total abdominal hysterectomy (TAH) and subtotal abdominal hysterectomy (STAH), to minimally invasive procedures, including vaginal hysterectomy, laparoscopically-assisted vaginal hysterectomy and laparoscopic hysterectomy. While it may be logical to assume that the minimally invasive approach is the more commonly used operation, less than one-third of women in the UK undergo vaginal or laparoscopic hysterectomy, with 67 percent undergoing TAH.[2] This statistic begs the question as to whether the high rate of TAH is due to an increased rate of complications and post-operative morbidity associated with the other available methods, or whether these methods are similar or superior in terms of outcome and are simply underused at the moment. The research presented in this review will attempt to explore this issue by comparing the available procedures in terms of operative complication rates, recovery times and postoperative outcomes.

The indications for hysterectomy are numerous, but there are several particularly common causes. Uterine leiomyomas or fibroids are a major cause of menorrhagia and intermenstrual bleeding and not uncommonly, pelvic pain and secondary dysmenorrhoea. They are present in up to 25 percent of all women but may be entirely asymptomatic.[3] Another common indication for hysterectomy is dysfunctional uterine bleeding, a diagnosis of exclusion which has no identifiable pathological cause but which results in unacceptable menstrual blood loss for the patient. Other indications include uterine prolapse, endometriosis and neoplasia of the cervix, endometrium and ovary. Hysterectomy may also be used in the surgical management of cancers of the colon, rectum and bladder. The procedure is not purely confined to the realms of gynaecology, but also has a number of obstetrical indications, such as massive post-partum haemorrhage secondary to uterine atony or uterine rupture, septic endometritis with pyometra or the very rare complication of inversion of the uterus after delivery of the placenta. It is also used in the management of some disorders of early pregnancy, such as ectopic pregnancies that have implanted in the cervix or cornual angle and in gestational trophoblastic disease where chemo-therapy has failed to halt the progression of the disease.

Since the first recorded hysterectomy, a subtotal procedure in 1843, there has been considerable

advancement in the types of hysterectomy performed. STAH involves the removal of the uterus only, leaving behind a cervical stump. Further surgical advances and the recognition that cancer occasionally developed in the remaining cervix led to the development of TAH, first attributed to E.H. Richardson in 1929.[1] TAH comprises removal of the body of the uterus and also the entire cervix *en bloc*. A hotly debated topic in gynaecological surgery has been the comparison of risks and benefits of TAH and STAH. A publication from a Finnish research group in 1980 claiming women who underwent STAH had better urinary and sexual function than those undergoing TAH caused further controversy.[4] This research suggested that dis-turbance of the pelvic plexus, which is essential in the coordinated contraction of bladder and bowel and is intimately related to the bladder, cervix and vagina, was at risk of damage during TAH. The interruption of autonomic innervation of the pelvic viscera may cause constipation and urinary problems after a TAH. By extension, disturbance in innervation of the cervix and vagina was thought to interfere with lubrication and orgasm, thus decreasing post-hysterectomy sexual function. This may have been strong evidence in favour of subtotal procedures, but further research from the same group was unable to corroborate the initial findings. Further trials, such as that published in 2003 by Learman *et al.* were also unable to demonstrate a benefit of STAH when compared to TAH, despite numerous factors that seemed to suggest that STAH might be superior to TAH.[5] The risk of developing a cervical cancer in the remaining cervical stump became much less relevant due to the advent of screening and the reduction of cervical cancer incidence by up to two-thirds in countries with a screening programme.[6] In practical terms, STAH is a simpler procedure, requiring little or no mobilisation of the bladder and minimal risk to the ureters as compared to TAH. The belief fostered by the Finnish research that sexual function was increasingly spared by STAH was a popular notion and one that was promoted by the press. However, without conclusive research it was impossible to determine which procedure was superior. Clearly, further rigorous randomised controlled trials were needed to clarify the issue.

The landmark trial that decided the matter for many authorities was published in the New England Journal of Medicine in 2002.[7] It was a randomised double-blinded controlled trial involving 279 women referred for hysterectomy due to benign gynaecological disease. Bladder, bowel and sexual function were all evaluated at 12 months postoperatively, as were postoperative complications. Bladder function was measured by assessment of urinary frequency, reduction in nocturia and reduction in stress incontinence. Bowel symptoms measured included constipation and use of laxatives. Sexual function was determined by ascertaining frequency of intercourse, orgasm and rating of sexual relationship with a partner. Women participating in the trial were randomised to two groups, one receiving TAH, the other undergoing STAH. It was found that neither procedure adversely affected pelvic organ function at 12 months. STAH resulted in fewer short-term complications, such as infection and had more rapid recovery, but caused cyclical bleeding and cervical prolapse long-term. Therefore, the claims that STAH was superior to TAH in terms of organ function were disproved and the presence of some long-term complications associated with the sub-total procedure were highlighted.

A further study published in 2003 suggested that the protective effects on the urinary tract believed to be conveyed by the subtotal procedure were also to be questioned, its results showed that a significantly smaller proportion of women randomised to the TAH group suffered from urinary incontinence one year post-operatively, as compared with the STAH group (9 percent versus 18 percent respectively, p=0.043).[8] This study group also found that 20 percent of the STAH group suffered from vaginal bleeding after the procedure and two of the group had to undergo subsequent procedures to remove the cervix. None of the women who had undergone the abdominal procedure suffered from post-operative vaginal bleeding. In light of this evidence, STAH may be of limited benefit as it may predispose the patient to further procedures if there is excessive vaginal bleeding or malignant change.

An alternative to the abdominal route is vaginal hysterectomy, in which there is no abdominal Pfannenstiel incision, and the procedure is performed entirely *per vaginam*. It was initially thought that it would cause less patient morbidity than the abdominal procedure. This has been shown by various studies, most notably the CREST study which reviewed 1851 hysterectomies performed between 1978 and 1981 in nine hospitals in the US. This study showed that the overall incidence of post-operative complications after antibiotics was 24.5 percent after vaginal

hysterectomy, compared with 42.7 percent after abdominal hysterectomy. It was concluded that the average woman of reproductive age with no significant past medical or surgical history (in particular, previous abdominal surgery) who received antibiotic prophylaxis would benefit more from a vaginal hysterectomy than an abdominal one.[9] The vaginal procedure, though taking slightly longer to perform, is the more cost-effective of the two procedures in terms of patient recovery and convalescence and monetary cost. Ottosen *et al*. demonstrated this in their randomised controlled trial published in 2000, which found that patients undergoing abdominal hysterectomy required on average one day more in hospital and one week more of convalescence than the vaginal cohort.[10]

On the basis of these findings, it would be reasonable to assume that vaginal hysterectomy should be the more commonly performed procedure. However, rates of abdominal hysterectomy in the United Kingdom are 67 percent compared with 30 percent performed vaginally (3 percent being laparoscopic).[2] There are some contraindications to vaginal hysterectomy, namely a large fibroid uterus and widespread endometriosis and/or adhesions. Relative contraindications to vaginal hysterectomy include nulliparity, a non-prolapsed uterus, need for salpingoophorectomy and previous pelvic surgery.[11]

Though there are a significant number of abdominal hysterectomies performed, it has been shown that women with relative contraindications to the vaginal procedure should not be required to undergo the more invasive abdominal procedure. This was demonstrated conclusively by Varma et al in their five-year study in which all hysterectomies were carried out by the vaginal route if technically possible, excluding those women with uterovaginal prolapse, very large leiomyomas (over 16 week size) and malignancy.[12] The rate of abdominal versus vaginal hysterectomies in the study centre at the outset was almost identical to that of the national average, 68 percent and 32 percent respectively. By the end of the study, 95 percent of procedures were performed via the vaginal route with most associated oophorectomies also being performed vaginally by the fifth year. There had been no change in case mix over the years of the study and there was no increase in the rate of complications or patient morbidity. The authors concluded that the major determining factor in the choice of route of hysterectomy was not the clinical scenario, but the attitude or preference of the surgeon. However impressive these results may seem, the clinical implications cannot be implemented unless the appropriate expertise is possessed by the operator. Current training practices do not afford trainee hysterectomists the opportunity to become equally comfortable with the various methods and to become proficient in vaginal hysterectomy, simply due to the continuing high rate of abdominal hysterectomy and a lack of opportunity to watch and participate in a sufficient number of vaginal procedures.[11]

One of the most significant advances in surgical procedure in recent years has been the advent of laparoscopy. This technique has been applied in almost every surgical speciality to great effect and offers a considerably less invasive procedure for the patient with the promise of a more uneventful recovery than if there had been an abdominal wound. As with other forms of major abdominal surgery, hysterectomy has been adapted to allow a laparoscopic approach to the operation. In a total laparoscopic hysterectomy (TLH), the entire procedure is performed under laparoscopic guidance and the uterus is removed through the vagina (either whole or morcellated) with no vaginal incision. In a laparoscopic-assisted vaginal hysterectomy (LAVH), a vaginal hysterectomy is performed after laparoscopic adhesiolysis or oophorectomy and ligation of uterine blood supply. As is the case in vaginal hysterectomy, laparoscopic hysterectomy has a number of relative contraindications including nulliparity, obesity and need for oophorectomy. Research shows that TLH is safe, feasible and results in minimal hospital stay for women irrespective of body mass index, with minimal complication rates in all groups. TLH may extend the possibility of minimally invasive hysterectomy to the very obese, for whom abdominal surgery poses a much greater risk.[13] Rates of complications associated with laparoscopic hysterectomy have been studied intensely.

Reports have varied as to whether the complication rate of laparoscopic hysterectomy differs from that of other methods, such as abdominal hysterectomy.[14,15] One trial which attempted to answer the question definitively was the VALUE study published in 2002, which involved 37,298 patients undergoing hysterectomy in the UK for benign conditions between 1994 and 1995.[2] Overall operative complication rates were found to be highest (6.07

percent) for laparoscopic techniques, compared with an overall complication rate for all procedures of 3.57 percent. Postoperative complications, when considered as an overall figure, were less in the laparoscopic group than the abdominal group (7.98 percent versus 8.31 percent respectively, p=0.01). However, the incidence of more severe post-operative complications was greater in the laparoscopic cohort. Despite this finding, laparoscopic hysterectomy is still a valuable technique due to advantages of shorter hospital stay and recovery time and better cosmesis after the procedure. Furthermore, the disadvantage of a higher complication rate could eventually be minimised by improved surgical skill. In his recent review of laparoscopic hysterectomy, Reich suggests that laparoscopic hysterectomy is an extremely valuable procedure for any surgeon to possess in their "procedural armamentarium" and that advancement of the laparoscopic procedure, as with the vaginal method, will depend primarily on training procedures and availability of experienced personnel in the techniques of laparoscopic hysterectomy.[16]

Despite extensive published research supporting the use of less invasive techniques such as vaginal hysterectomy, LAVH and TLH, there is still a trend amongst practitioners to hysterectomize their patients via the traditional abdominal approach. These procedures have been proven to be superior to abdominal hysterectomy in terms of burden of procedure for the patient, recovery, convalescence and cosmesis. While the risk of intraoperative complication is marginally increased in laparoscopic and possibly in vaginal procedures, it is thought that this can be minimised with operator proficiency and experience. Many intraoperative complications may be repaired laparoscopically without recourse to laparotomy.[16] It is therefore clear that the persistence of an abdominal hysterectomy rate of 67 percent compared to a laparoscopic rate of only 3 percent is a statistic that needs to be addressed by the bodies overseeing surgical training, by practising surgeons and by women themselves. With increased access to information and involvement in the decision-making process, many women may demand a more minimally invasive method of treatment and oblige practitioners to extend their "procedural armamentarium". It is the responsibility of health care professionals to increase teaching and implementation of vaginal and laparoscopic hysterectomies to ensure that women receive the optimal treatment. Treatment options must be supported by the best evidence and also afford maximum satisfaction and quality of life for the patient.

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