Uterine prolapse — preservation or excision?
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Abstract
The pathological cause of uterine prolapse is loss of integrity of the uterosacral and cardinal ligament complex and a weakening of the pelvic floor diaphragm. Uterine descent is a consequence rather than the cause of pelvic organ prolapse. However vaginal hysterectomy is an operation which is commonly performed to treat uterine prolapse. Does the uterus need to be removed? The advent of minimally invasive surgical techniques and a shift towards patient centred care is leading surgeons to question the need to remove the uterus. This article examines the facts and evidence behind the debate.

Keywords uterine preservation; uterine prolapse; vaginal hysterectomy

Introduction
In the UK prolapse surgery accounts for 20% of women awaiting major gynaecological surgery. Prolapse becomes more common with age. Hence it is expected that the number of surgical interventions for prolapse will increase as the population ages.

The treatment of pelvic organ prolapse (POP) is an area of medicine which appears intuitive. The majority of treatments are justified through traditional practice rather than scientific evidence. However more rigorous examination of practice reveals significant controversies, these include a lack definition of prolapse, uncertainty about the effectiveness of treatment and controversy with regards to concomitant continence surgery. This is true of vaginal hysterectomy as a treatment for uterine prolapse. In addition to this some women are requesting preservation of their uterus at the time of pelvic organ prolapse (POP) repair. Factors which may influence their desire to avoid hysterectomy include a desire to maintain fertility, a belief that the uterus is important in sexual function, an increase in conservative treatments for menorrhagia such as endometrial ablation and for some women the uterus is a central focus of their femininity hence hysterectomy can have a negative impact on their body image and mental health. In the elderly a desire to avoid hysterectomy may be driven by a fear of major surgery and the length of recuperation.

The technical advances in the equipment available to pelvic floor surgeons may also be driving the move towards uterine preservation. There have been notable improvements in the synthetic material used to reconstruct the damaged connective tissues. Devices to place sutures or mesh, via the vagina, into the arcus tendinious fascia pelvis and sacrospinous ligament with accuracy and minimal dissection have been developed. The general trend towards increased sub specialization within Obstetrics and Gynaecology may be improving surgical skills. There have been considerable advances in laparoscopic surgical skills over the last decade which may also be driving this change in practice towards uterine preservation.

In recent years there has been an increased emphasis on evidence-based practice. Urogynaecologists use psychometrically validated instruments to assess the impact of symptoms on the patients quality of life and anatomical outcomes are assessed with standardized tools such as the Pelvic Organ Prolapse Quantification (POP-Q) system. These changes may be leading surgeons to critically re evaluate traditional techniques.

Definition of uterine prolapse
What is uterine prolapse? The National Institute of Health (NIH) define of uterine prolapse as the falling or sliding of the uterus from its normal position in the pelvic cavity into the vaginal canal. Swift performed a study of prolapse in a sample of 477 women seen for annual gynaecologic examinations in the USA. Using the NIH definition of prolapse in Swift’s population over 90% of all women have prolapse. This suggests the NIH definition is not clinically useful.

The POP-Q (Pelvic Organ Prolapse Quantification System) (Figure 1) was first published in 1996 and allows accurate reproducible measurement of prolapse. Compared to the traditional practice of recording prolapse using subjective terms such as large, medium or small this represents a significant advance. However there have been no studies to assess the level of descent within the vagina at which uterine prolapse becomes clinically significant. Is it when the cervix reaches the hymen or at 50% descent of the total vaginal length? Why does one surgeon perform a vaginal hysterectomy when the cervix is 4 cm above the hymen and another to perform only an anterior repair leaving the uterus in situ? Is it the height of the anterior lip of cervix above the hymen or the level of the uterosacral ligaments which is important in determining the need for vaginal hysterectomy?

Pathophysiology of uterine prolapse
The pathological cause of uterine prolapse is loss of integrity of the uterosacral and cardinal ligament complex and a weakening...
of the pelvic floor diaphragm. The concept that descent of the uterus is a consequence rather than the cause of POP is not new. In 1934 Bonney suggested that the uterus probably had a passive rather than an active role in uterine prolapse hence removing it to treat prolapse does not appear logical. Bonney provided a simple analogy of prolapse using a surgical glove. The eversion of an intussuscepted surgical glove finger by increasing pressure within the glove is analogous to prolapse (Figure 2).

**Surgical treatment**

The aims of treatment are to restore not only anatomy but also function. This should be achieved with minimal morbidity or side effects and the time to recovery of normal activity should be as short as possible.

Hysterectomy at the time of prolapse surgery may increase blood loss, surgical operating time, length of stay in hospital and the period of convalescence. Up to one in four women will develop a pelvic haematoma following vaginal hysterectomy. Vaginal hysterectomy may cause greater disruption of the neurovascular supply to the pelvic floor there by exacerbating future prolapse and potentially having a detrimental impact on bladder, bowel or sexual function. Despite this the traditionally vaginal hysterectomy has been the most frequently performed operation for uterine prolapse.

The potential detrimental effects of uterine preservation surgery (UPS) are the subsequent development of uterine or cervical disease. The most significant being endometrial or cervical cancer. Studies have shown the risk of cervical cancer following subtotal hysterectomy is about 0.1% and the incidence of endometrial cancer is approximately 0.2%. It is therefore important to establish that there is no history of abnormal cervical smears and the endometrium should be assessed prior to UPS. In pre menopausal women the presence of fibroids is a relative contra indications however if fertility is to be maintained or a woman is adamant she wishes to retain her uterus then UPS could be performed in combination with myomectomy or following successful embolization of the fibroid.

Uterine preservation surgery falls into two major categories hysteropexy procedures which attempt to restore normal anatomy and preserve function and “obliterative” procedures which close the vaginal lumen.

**Techniques of uterine preservation surgery (UPS)**

The techniques of uterine preservation surgery are not new. One of the earliest operations for uterine prolapse was the Manchester Repair, first described by Donald of Manchester in 1888 and subsequently modified by Fothergill. The procedure involves transvaginal cervical amputation, anterior colporrhaphy and fixation of the uterosacral ligaments anteriorly and a “well-formed” perineorrhaphy. However the Manchester Repair has several potential problems not least the perineorrhaphy which may conceal any laxity of the upper supports but may also result in dyspareunia. The Manchester Repair can also result in stenosis of the cervical canal. In premenopausal women this can cause painful haematometra and in post-menopausal women in the event of post-menopausal bleeding it can make physical assessment of the endometrium very difficult. In women wishing to preserve fertility the Manchester Repair is not recommended because cervical stenosis may cause sub fertility and there is also a theoretical risk of cervical incompetence during pregnancy due to the amputation of the cervix.

The two most common modern techniques are vaginal sacrospinous hysteropexy and abdominal sacrohysteropexy. (In some text these with be described as cervicopexy rather than hysteropexy). Abdominal sacrohysteropexy can be performed using an open or laparoscopic approach.

**Abdominal sacrohysteropexy (open or laparoscopic)**

This technique was first described by Arthure in 1957. They described suturing the body of the uterus directly to the anterior ligament of the spine at the level of the intervertebral disc between L5 and S1 with two silk sutures. Since then several techniques have been described using a variety of synthetic mesh to attach the cervix and/or the vagina to the anterior spinal ligament. Currently the most commonly reported technique appears to be a variation on that described by van Lindert et al in 1993 however current techniques use type I polypropylene mesh rather than Gore-Tex. This technique involves attaching mesh to the anterior surface of the cervix and passing it through an avascular area of the broad ligament approximately 1 cm above the level of the cervico-uterine junction.

Roovers et al performed a randomized trial of open abdominal sacrohysteropexy and vaginal hysterectomy, with the vault suspended to the uterosacral/cardinal ligament. There were only 41 patients in each arm. They reported a re-operation rate, either performed or planned of 22% in the patients who underwent abdominal surgery and only 5% in those who underwent vaginal surgery. Hence they concluded that vaginal hysterectomy with anterior and/or posterior colporrhaphy is preferable to abdominal sacrocolpopexy with preservation of the uterus as surgical correction in patients with uterine prolapse stages II—IV. However there have also been several case series of both open and laparoscopic sacrohysteropexy which have reported with excellent results albeit the numbers are very small (3—34 subjects) and retrospective chart reviews are known to be associated with higher success rates than a prospective randomized trial. There is considerable variation in surgical techniques between these series and this makes comparison of results very difficult. The reported failure rates range from 0% to 8%.
Recently two case series of laparoscopic sacrohysteropexies have been published. Rosenblatt et al reported a 100% anatomical and subjective cure at 12 months. Price et al reported 51 cases and only one recurrence however follow up was conducted at 10 weeks post-operation. Essentially the level of evidence for use of open or laparoscopic sacrohysteropexy to treat uterine prolapse is very poor and further studies are required.

**Vaginal sacrospinous hysteropexy**

This technique was first described by Richardson et al in 1989. A longitudinal incision is made in the posterior vaginal wall to expose the rectovaginal space. Dissection is continued on the right to reach the ischial spine. The sacropinous ligament is palpated as it passes in a posterior medial direction to the lower aspect of the sacrum. There a variety of techniques described to suture the posterior aspect of the cervix to the ligament.

Three retrospective case control studies have compared vaginal hysterectomy (VH) to uterine sparing sacropunous hysteropexy (USSH). These demonstrated no significant difference between USSH and VH in terms of objective or subjective cure rates. The operating time and blood loss were both less for USSH compared to VH. However the numbers were again small in all three studies, only 35–60 patients in each group.

There has only been one RCT comparing USSH to VH, published by Dietz et al. The study was however underpowered because only 17% of the 409 women approached were prepared to be randomized. The main reasons stated for non-randomization were either women felt hysterectomy was unnecessary or they strongly believed that if hysterectomy was performed then prolapse could not recur. This recruitment problem will need to be overcome in future trial designs. Future trials may require a patient preference arm to resolve this.

The study by Dietz et al demonstrated a shorter recovery period for USSH compared to VH. However USSH was associated with a slightly higher number of apical recurrences, 11% of USSH required further prolapse surgery compared to 7% in the VH group. The study concluded that USSH was associated with an earlier recovery time, more recurrent apical prolapse but no difference in functional outcomes and quality of life.

**Tension free vaginal mesh (TVM)**

Tension free vaginal mesh kits have been developed over the last 5 years. These involve the insertion of relatively large pieces of synthetic metal into the rectovaginal and vesicovaginal spaces without suturing. The majority are used to treat anterior, posterior or vault prolapse however the uterus can be preserved. Takahashi et al reported a prospective case series, with 1 year follow up, in 102 patients. Five women experienced recurrent uterine prolapse and required vaginal hysterectomy. Further research is required before TVM kits can be used in routine clinical practice.

**Pregnancy after uterine preservation surgery**

There are case reports of pregnancies following all of the above techniques except TVM and this is probably because TVM is a relatively new procedure. It is however difficult to counsel women about the impact these procedures have on fertility or on the chances of having an uncomplicated pregnancy. Conservative measures such as ring pessaries should always be tried if a woman is actively trying to conceive however occasionally the prolapse is too severe and surgery is the only option.

**Obliterative techniques**

The modern colpocleisis was first described by Le Fort in 1877. A rectangular area of partial thickness vaginal epithelium is excised from the anterior and posterior vaginal wall. These are then sutured together, this partially obliterates the vaginal cavity but allows two drainage channels for cervical secretions. Frequently the procedure is combined with a high perineorrhaphy. Several large retrospective case series have been published. Colpocleisis appears to be an effective treatment for stage 3 or 4 uterine prolapse. Anatomical success rates appear to be very high, recurrence occurring in only 1–2%.

This however is an obliterative procedure following which penetrative vaginal sex is not possible. There is very little literature about subsequent following closure of the vagina. In one series of 141 women 2 expressed regret. One of whom managed to re-establish penetrative intercourse by using dilators. In the same series four husbands expressed regret that their wives had undergone the procedure.

This operation is usually only used in the frail elderly or in patients with severe co morbidities, it can be performed under local anaesthetic. This procedure does none the less have an associated mortality rate of about 1 in 400 from pulmonary embolism, cardiovascular disease and cerebral vascular accidents which is related to the poor pre operative health of the subjects. The morbidity and mortality will increase if a concomitant hysterectomy is performed.

Subsequent stress incontinence can occur however this can be minimized by starting the excision at least 2–3 cm from the urethral meatus and rectal prolapse has been reported in 1–2% of cases.

**Conclusion**

The first vaginal hysterectomy specifically performed for (POP) is believed to have been performed by an American Civil War surgeon Samuel Choppin in 1861. It would appear that the decision to perform a vaginal hysterectomy is based more on surgical habit which probably results from the apprenticeship patterns of surgical training than any scientific evidence. The increasing adoption of uterine preserving techniques in recent years requires critical study to ensure a better outcome is produced.

**FURTHER READING**


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