Complications of Hysterectomy: A Review

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Abstract

Hysterectomy is a safe operation. It could be performed, abdominally, vaginal or laparoscopic approach. They are performed for different indications like dysfunctional uterine bleeding (DUB), endometriosis, fibroids or prolapse. About 100,000 hysterectomies are performed annually in the UK. Risks and complications depend on certain factors like age, parity, type of hysterectomy, the individual women's health status and the surgeon expertise. About 100,000hystrectomies are done annually in the UK. Complications generally are both operative and postoperative; they range from hemorrhage, ureteral injury, bladder injury thromboembolic disease, infections, vault prolapse and vaginal cuff evisceration. In the long-term some women may suffer early menopause, impaired sexual function or psychological effects. Strategies to minimize recognised complications include fresh pair of eyes', multidisciplinary approach and optimizing patients and careful selection of patients with suitable indications**.**

Key words: Hystrectomy, complications, review

Introduction

Hysterectomy is the surgical removal of the uterus, usually performed by a Gynaecologist. The three choices are abdominal (TAH), vaginal and laparoscopically assisted, with the first being the most common and the last has the potential for short hospital stay [1]. It is the most commonly performed gynaecological surgical procedure. In 2003, over 600,000 hysterectomies were performed in the United States alone, of which over 90% were performed for benign conditions In the United Kingdom about 100,000 hysterectomies are performed annually.[1] Such rates being highest in the industrialized world has led to the major controversy that hysterectomies are being largely performed for unwarranted and unnecessary reasons.[2]thus hysterectomy should only be offered to women whose family is complete.

Removal of the uterus renders the patient unable to bear children (as does removal of ovaries and fallopian tubes) and has surgical risks as well as long-term effects, so the surgery is normally recommended when other treatment options are not available. It is expected that the frequency of hysterectomies for non-malignant indications will fall as there are good alternatives in many cases.[3]Oophorectomy is frequently done together with hysterectomy to decrease the risk of ovarian cancer. However, recent studies have shown that prophylactic oophorectomy without an urgent medical indication decreases a woman's long-term survival rates substantially and has other serious adverse effects,[4] particularly in terms of inducing early-onset-osteoporosis and this effect is not limited to pre-menopausal women; even women who have already entered menopause were shown to have experienced a decrease in long-term survivability post-oophorectomy.[5]

Literature review

Incidence

The incidence of hysterectomy varies world-wide. Figures from the industrialized nation range from100, 000 annually in UK to in USA. [6,7,8]While the incidence and indications are much lower in the developing nations like Nigeria and Asia (41). In Canada, the number of hysterectomies between 2008 and 2009 was

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almost 47,000. [7]The reasons for hysterectomies differed depending on whether the woman was living in an urban or rural location. Urban women opted for hysterectomies due to uterine fibroids and rural women had hysterectomies mostly for menstrual disorders.[8]

In the United States According to the National Center for Health Statistics, of the 617,000 hysterectomies performed in 2004, 73% also involved the surgical removal of the ovaries.[7,8] There are currently an estimated 22 million people in the United States who have undergone this procedure. An average of 622,000 hysterectomies a year have been performed for the past decade.[9,10]

In the UK, one in 5 women are likely to have a hysterectomy by the age of 60, and ovaries are removed in about 20% of hysterectomies.[1,11]

Indications

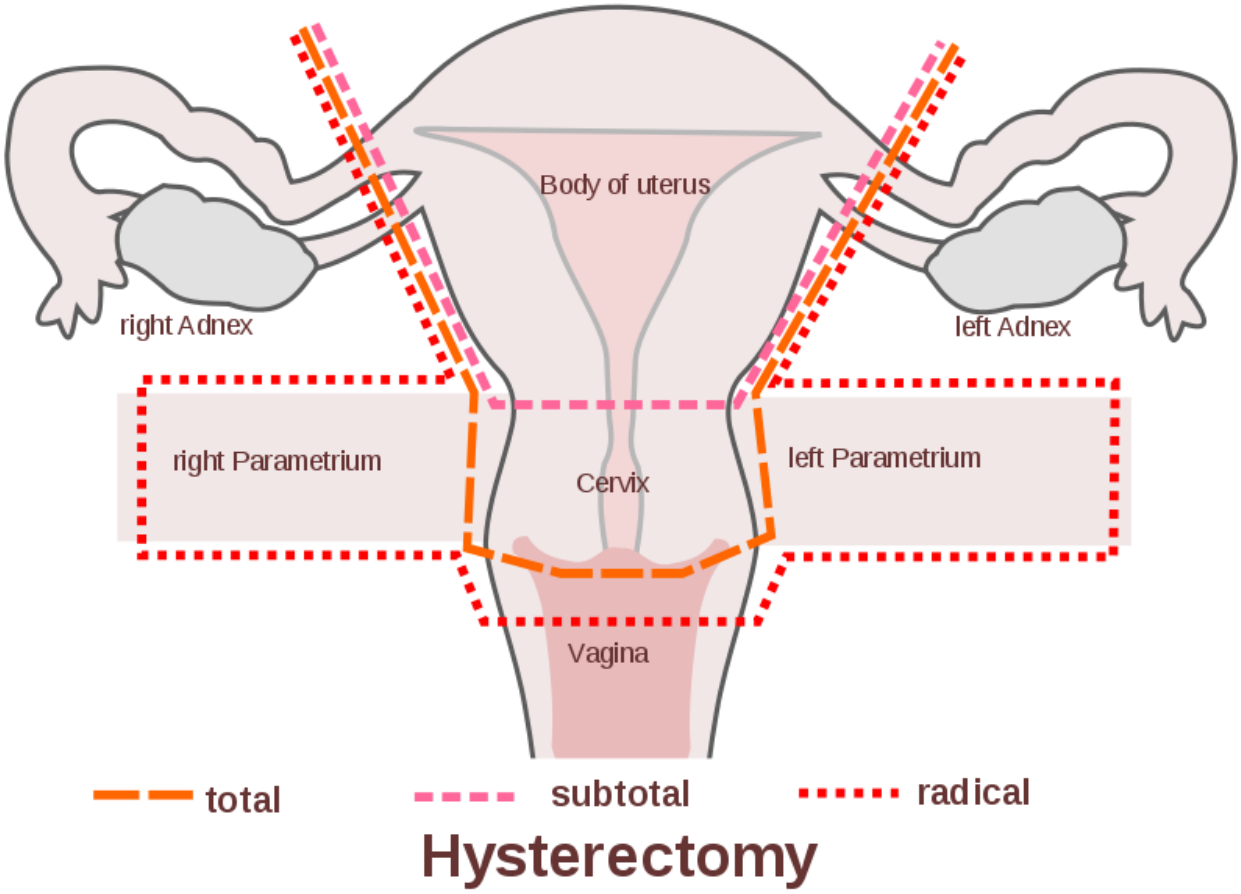
Hysterectomy is a major surgical procedure that has risks and benefits, and affects a woman's hormonal balance and overall health for the rest of her life. Because of this, hysterectomy is normally recommended as a last resort to remedy certain intractable uterine/reproductive system conditions. Such conditions include, but are not limited to:

Certain types of reproductive system cancers (uterine, cervical, ovarian, endometrium) or tumors, including uterine fibroids that do not respond to more conservative treatment options.[9,11]

Severe and intractable endometriosis and/or adenomyosis and chronic pelvic pain, after failure intractable to medical treatment.[9]Other indications include different forms of vaginal prolapse.[9]

Rarely it is done as prophylaxis against certain reproductive system cancers, especially if there is a strong family history of reproductive system cancers (especially breast cancer in conjunction with BRCA1 or BRCA2 mutation), or as part of recovery from such cancers

Types of hysterectomy



Schematic drawing of types of hysterectomy

Hysterectomy, in the literal sense of the word, means merely removal of the uterus.

Radical hysterectomy: Generally done in cases of cancer. Lymph nodes, ovaries and fallopian tubes are also usually removed in this situation.

Total hysterectomy: Complete removal of the uterus and cervix, with or without oophorectomy.

Subtotal hysterectomy: removal of the uterus, leaving the cervix in situ.

Vaginal hysterectomy: removing the uterus vaginally,

Laparoscopic hysterectomy, Laparoscopic-assisted vaginal hysterectomy

Robotic hysterectomy: This procedure is like laparoscopic surgery, but a special machine (robot) is used. Robotic surgery is most often used to perform a hysterectomy when a patient has cancer or is overweight and vaginal surgery is not safe.

Subtotal hysterectomy was originally proposed with the expectation that it may improve sexual functioning after hysterectomy, it has been postulated that removing the cervix causes excessive neurologic and anatomic disruption, thus leading to vaginal shortening, vaginal vault prolapse, and vaginal cuff granulations. These theoretical advantages were not confirmed in practice, but other advantages over total hysterectomy emerged. The principal disadvantage is that risk of cervical cancer is not eliminated and women may continue cyclical bleeding (although substantially less than before the surgery). These issues were addressed in a systematic review of total versus subtotal hysterectomy for benign gynecological conditions, which reported that, there was no difference in the rates of incontinence, constipation, measures of sexual function or alleviation of pre-surgery symptoms. Length of surgery and amount of blood lost during surgery were significantly reduced

during subtotal hysterectomy compared to total hysterectomy, but there was no difference in post-operative transfusion rates. Febrile morbidity was less likely and ongoing cyclic vaginal bleeding one year after surgery was more likely after subtotal hysterectomy. There was no difference in the rates of other complications, recovery from surgery, or readmission rates.[12,13]

Technique

Hysterectomy can be performed in different ways. The oldest known technique is through abdominal incision. Subsequently the vaginal and later laparoscopic assisted vaginal techniques were developed and now laparoscopic abdominal hysterectomy.

In open abdominal hysterectomy a transverse (Pfannenstiel) incision is made through the abdominal wall. This technique allows the greatest access to the reproductive structures and is normally done for removal of the entire reproductive complex. The recovery time for an open hysterectomy is 4–6 weeks and sometimes longer. The biggest problems with this technique were infections, though infection rates are better controlled and not necessarily a major concern in modern medical practice.[13,14]

Vaginal hysterectomy is performed entirely through the vaginal canal and has clear advantages over abdominal surgery such as fewer complications, shorter hospital stays and shorter healing time.

With the development of the laparoscopic techniques in the 1970-1980s, the "laparoscopic-assisted vaginal hysterectomy" (LAVH) has gained great popularity among gynecologists because compared with

The "laparoscopic-assisted Supracervical hysterectomy" (LASH) was later developed to remove the uterus without removing the cervix using a morcellator which cuts the uterus into small pieces that can be removed from the abdominal cavity via the laparoscopic ports.

Total laparoscopic hysterectomy (TLH) is performed solely through the laparoscopes in the abdomen, starting at the top of the uterus. The entire uterus is disconnected from its attachments using long thin instruments through the "ports".

Supracervical (subtotal) laparoscopic hysterectomy (LSH) is performed similar to the total laparoscopic surgery but the uterus is amputated between the cervix and fundus.

"Robotic hysterectomy" is a variant of laparoscopic surgery using special remotely controlled instruments that allow the surgeon finer control as well as three-dimensional magnified vision.[15,16,17]

Comparison of different techniques

The abdominal technique is very often applied in difficult circumstances or when complications are expected. Given these circumstances the complication rate and time required for surgery compares very favorably with other techniques, however time required for healing is much longer.Vaginal hysterectomy was shown to be superior to LAVH and some types of laparoscopic surgery (sufficient data was not available for all types of laparoscopic surgery), causing fewer short- and long-term complications, more favorable effect on sexual experience with shorter recovery times and fewer costs.[18][19][20]

A Cochrane review from 2009 recommends vaginal hysterectomy over other variants where possible. Laparoscopic surgery offers certain advantages when vaginal surgery is not possible but has also the disadvantage of significantly longer time required for the surgery.[21] In direct comparison of abdominal and laparoscopic techniques laparoscopic surgery has longer operation time and substantially higher rate of major complications while offering much quicker healing.[21][22]Time required for completion of surgery in the eVAL trial is reported as following:[22]abdominal 55.2 minutes average, range 19-155vaginal 46.6 minutes average, range 14-168laparoscopic (all variants) 82.5 minutes average, range 10-325 (combined data from both trial arms)

Robotic surgery has very similar clinical outcomes like laparoscopic or vaginal techniques. Small advantages such less blood loss come at the cost of substantially longer operating times and higher costs.[23,24,25]

Benefits

The Maine Women Health Study of 1994 followed for 12 months approximately 800 women with similar gynecological problems (pelvic pain, urinary incontinence due to uterine prolapse, severe endometriosis, excessive menstrual bleeding, large fibroids, painful intercourse), around half of whom had a hysterectomy and half of whom did not. The study found that a substantial number of those who had a hysterectomy had marked improvement in their symptoms following hysterectomy, as well as significant improvement in their overall physical and mental health one year out from their surgery. The study concluded that for those who have intractable gynecological problems that had not responded to non-surgical intervention, hysterectomy may be beneficial to their overall health and wellness. Somewhat surprisingly, ovarian cancer risk after hysterectomy appears to be substantially lowered even when the ovaries are preserved.[26]

Risks and side effects

In a study by McPherson et al where they studied the complication of vaginal ,abdominal and laparoscopic uterine excision and collected data on all hysterectomies done in UK between Oct 1994 and September 1995. They studied 37,512 women from the 26NHS and 15 private hospitals; they found severe operative complication risk to be 3%. These risks increase with parity and history of serious illness, but it decreases in the presence of fibroids. Laparoscopic procedures were associated with a near doubling of the risk (VALUE study).[17,23].

In terms of postoperative complications from the same study, they strongest predictor was a history of operative complications (laparoscopic 1.7%, vaginal 1.2% and abdominal 0.9%).

Table 1 Finnish Study

	Abdominal	Vaginal	Laparoscopic
Overall complications %	17.2	23.3	19.0
Infections(most common(%	10.5	13.0	9.0
Severe hemorrhage %	2.1	3.1	2.7

Table II Finnish Study

	Abdominal	Vaginal	Laparoscopic
Ureteric injury	Less common	Least common	More common
Bowel injury	Less common	More common	Not compared
Surgeons Experience Bladder and ureteric injuries in the laparoscopic group only			Surgeon who performed more than 30procedures have lower incidence of both ureteric (0.5%)and bladder(0.8%), than those that performed less(2.2% and 2.0%)

Table 1 above gave a breakdown of complication from the FINNISH study that compares all the three approaches. In addition they also compare other parameters ureteric injuries, bowel injuries and surgeons experience and expertise their findings were most interesting.

Mortality and surgical risks

Short term mortality (within 40 days of surgery) is usually reported in the range of 1-6 cases per 1000 when performed for benign causes. Risks for surgical complications are presence of fibroids, younger age (vascular pelvis with higher bleeding risk and larger uterus), dysfunctional uterine bleeding and parity. The mortality rate is several times higher when performed in patients that are pregnant, have cancer or other complications.[27,28]

Long term effect on all case mortality is relatively small. Women under the age of 45 years have a significantly increased long term mortality that is believed to be caused by the hormonal side effects of hysterectomy and prophylactic oophorectomy.[29,30]

Approximately 35% of women after hysterectomy undergo another related surgery within 2 years.

1. ***Ureteral injury*** is not uncommon and can range from 2.2% to 3% depending on whether the modality is abdominal, laparoscopic, or vaginal. The injury usually occurs in the distal ureter close to the infundibulopelvic ligament or as a ureter crosses below the uterine artery, often from blind clamping and ligature placement to control hemorrhage.[20]

2. ***Infection***

There is always a risk that an infection will develop after an operation. This could be urinary tract infection, wound infection and occasionally vaginal infection

3. ***Bleeding***

As with all major operation there is a small risk of infection especially with abdominal hysterectomy, though in all types of hysterectomy this complication could be encountered.

4. ***Thrombosis***

This is less common with laparoscopic hysterectomy due to shorter hospital stay. The risk increases during period of immobility.

5. ***Unintended oophorectomy and premature ovarian failure***

Removal of one or both ovaries is performed in a substantial number of hysterectomies that were intended to be ovary sparing.[31]

The average onset age of menopause in those who underwent hysterectomy is 3.7 years earlier than average even when the ovaries are preserved.[32] This has been suggested to be due to the disruption of blood supply to the ovaries after a hysterectomy or due to missing endocrine feedback of the uterus. The function of the remaining ovaries is significantly affected in about 40% women, some of them even require hormone replacement treatment. Surprisingly, a similar and only slightly weaker effect has been also observed for endometrial ablation which is often considered as an alternative to hysterectomy.

6. ***Premature menopause and its effects***

Estrogen levels fall sharply when the ovaries are removed, removing the protective effects of estrogen on the cardiovascular and skeletal systems. This condition is often referred to as "surgical menopause", although it is substantially different from a naturally occurring menopausal state; the former is a sudden hormonal shock to the body that causes rapid onset of menopausal symptoms such as hot flashes, while the latter is a gradually occurring decrease of hormonal levels over a period of years with uterus intact and ovaries able to produce hormones even after the cessation of menstrual periods.

When only the uterus is removed there is a three times greater risk of cardiovascular disease. If the ovaries are removed the risk is seven times greater. Several studies have found that osteoporosis (decrease in bone density) and increased risk of bone fractures are associated with hysterectomies.[32,33] This has been attributed to the modulatory effect of estrogen on calcium metabolism and the drop in serum estrogen levels after menopause can cause excessive loss of calcium leading to bone wasting.

Hysterectomies have also been linked with higher rates of heart disease and weakened bones. Those who have undergone a hysterectomy with both ovaries removed typically have reduced testosterone levels as compared to those left intact.[34] Reduced levels of testosterone in women is predictive of height loss, which may occur as a result of reduced bone density,[35] while increased testosterone levels in women are associated with a greater sense of sexual desire.[35].Oophorectomy before the age of 45 is associated with a fivefold mortality from neurologic and mental disorders.[36]

7. ***Urinary incontinence and vaginal prolapse***

Urinary incontinence and vaginal prolapse are well known adverse effects that develop with high frequency a very long time after the surgery. Typically, those complications develop 10–20 years after the surgery.[26,36] For this reason exact numbers are not known, and risk factors are poorly understood. It is also unknown if the choice of surgical technique has any effect. It has been assessed that the risk for urinary incontinence is approximately doubled within 20 years after hysterectomy. One long term study found a 2.4 fold increased risk for surgery to correct urinary stress incontinence following hysterectomy [37].

The risk for vaginal prolapse depends on factors such as number of vaginal deliveries, the difficulty of those deliveries, and the type of labor. Overall incidence is approximately doubled after hysterectomy.[38]

5. Effects on social life and sexuality

Some women find their natural lubrication during sexual arousal is also reduced or eliminated. Those who experience uterine orgasm will not experience it if the uterus is removed. The vagina is shortened and made into a closed pocket and there is a loss of support to the bladder and bowel.

8. ***Adhesions formation and bowel obstruction***

The formation of postoperative adhesions is a particular risk after hysterectomy because of the extent of dissection involved as well the fact the hysterectomy wound is in the most gravity-dependent part of the pelvis into which a loop of bowel may easily fall.[31] In one review, incidence of small bowel obstruction due to intestinal adhesion were found to be 15.6% in non-laparoscopic total abdominal hysterectomies vs. 0.0% in laparoscopic hysterectomies.[28]

9***. General anaesthetics***,

Serious complications are rare an estimate of 1 in 10,000 has been reported after general anaesthesia

10. ***Other rare problems***

Hysterectomy may cause an increased risk of the relatively rare renal cell carcinoma. Hormonal effects or injury of the ureter were considered as possible explanations.[32]

Removal of the uterus without removing the ovaries can produce a situation that on rare occasions can result in ectopic pregnancy due to an undetected fertilization that had yet to descend into the uterus before surgery. Two cases have been identified and profiled in an issue of the Blackwell Journal of Obstetrics and Gynecology; over 20 other cases have been discussed in additional medical literature.[34]

Operative and post-operative complications are infections .majority of minor 6-25%for abdominal versus 4-10% for vaginal. Ureteric injuries are increasing due to increase in the number of laparoscopic procedures (0.7-1.7%), while bladder injury account for 0.5-2% of all hysterectomies. Bowel injury seems rare though up to 0.6 -2% have been reported. The RCOG reported risk of serious complications in TAH.. They found that damage to the bladder and or ureter was 7 women in every 1000 and long-term disturbances of bladder function was un common, Damage to the bowel was

reported in 4 in 10,000 women and is quite rare, while hemorrhage requiring transfusion was in 23 women out of every 100 [1,3]

Long-term complications

Long-term complications include, early menopause, impaired sexual function and occasionally psychological effects: Injury to the bladder or ureters, pain during sexual intercourse, vaginal prolapse, early menopause, and decreased interest in sex.

Economic implications

Economic implications vary with the type of hysterectomy and the expertise of the surgeon. In general, when return to normal function is considered, laparoscopic assisted vaginal hysterectomy LAVH was the most cost effective way to accomplish hysterectomy. Despite higher direct costs, length of hospital stay and return to work were shorter with LAVH relative to both TAH and vaginal hysterectomy.[1]

Conclusion

Hysterectomy is a simple operation with different indications. Risk and complications depends on several factors including women's health and surgeon's experience and expertise. Complications are both early and long-term. To minimize most of these complication second opinion fresh eyes and multi-disciplinary approach is recommend in all patients undergoing this procedure/.

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