HYSTERECTOMY: RECENT TRENDS & ALTERNATIVES : AN OVERVIEW

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Summary

Hysterectomy is one of the most popular surgeries performed in the field of Obstetrics and Gynaecology next to caesarean seection. It is performed not only for malignant disease but also for many benign conditions such as fibroids, endometrial hyperplasia, adenomyosis Pelvic Inflammatory disease (PID), uterine prolapse, dysfunctional uterine bleeding (DUB) and cervical intraepithelial neoplasia. Most of the indications are for benign pelvic pathology, which though not life threatening but have a profound impact on the quality of life. In the last decades, newer indications are constantly added to the list and at the same time there are emergence of newer treatments modalities, techniques and alternatives. In many new techniques, conservation of the uterus have been developed and their results are promising and in many cases comparable with hysterectomy. Though menorrhagia is the most commonest indication, in most of the cases it is not due to any organic pelvic pathology and amenable to newer and modern alternative managements, which is responsible for the fall in the rate of hysterectomy worldwide. For developing countries it is still the surgery which is performed for most of the cases of benign pelvic pathology. There are many approaches to hysterectomy for benign disease: Abdominal hysterectomy (AH), Vaginal hysterectomy (VH), laparoscopic Assisted vaginal hysterectomy (LAVH), Total laparoscopic hysterectomy (TLH) and Subtotal laparoscopic hysterectomy (STLH). This paper is a review of all the existing hysterectomy techniques and the alternative methods for benign indications. Up-to-date knowledge and skill of the different newer procedures and interventions are the primary factors for clinical decision making for adopting such procedures in action and implementation. The techniques, routes, long & short term outcomes, feasibility, cost-effectiveness and improvements in the patients quality of life are all need to be considered for accepting a particular method.

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Key words

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Introduction

Hysterectomy is one of the most frequently performed operations done in female next to Caesarean section[1]. It is one of the commonest intra-abdominal surgeries (laparotomy) performed together with cholecystectomy and appendicectomy[1]. Historically the first vaginal hysterectomy was performed by Conrad Langenbeck in 1813, the first subtotal abdominal hysterectomy by Walter Burnham in 1853, the first elective abdominal hysterectomy by Clay and Koeberle in 1863, and the first laparoscopic hysterectomy by Harry Reich in 1982. Abdominal hysterectomy continues to be the preferred method in approximately 60-70% of benign uterine diseases except for prolapsed uterus, which is almost always done by vaginal route[2,3]. The argument were that, it allows clear visualization and satisfactory manipulation of the structures involved. Now with the established advantages of the vaginal route for hysterectomy, question arise , Is this a sign of a deficit in training and acquisition of skill that is transmitted from generation to generation[4]? Now a days, there is a strong move is towards vaginal hysterectomy for non-prolapsed uterus also and laparoscopic assistance for those cases where there is extensive adhesion, need for adnexectomy, removal of big size uterus and where there is extensive pelvic adhesion as with endometriosis and PID. The role of abdominal hysterectomy is gradually declining and only restricted for those cases where vaginal and laparoscopic route is not possible or difficult and for cases with intra-abdominal malignancy[5]. The advantages and scientific evidence strongly in favor of VH and or laparoscopic hysterectomy (LH) due to their lower complication rates, less post-operative pain, shorter hospital stay and early ambulation with a more rapid return to normal activity, resulting a better quality of life. Vaginal hysterectomy (VH) with its high cost- effectiveness ratio make it the first choice option for most of the indications in clinical practice specially for resource constrain countries. If there is any contraindications or difficulties are expected of, vaginal surgery should be performed with the aid of laparoscopy when and where necessary[5]. Different promising alternatives like –medicinal, hormonal, leaser invasive ablative procedures and uterine artery embolisation and many others are available world wide with their added advantages and disadvantages.

Unfortunately the ultimate decision for adopting a particular route or alternatives for hysterectomy will depends on availability of the particular option, skill of the surgeon, local practice than the advantages of the technique of a particular route[5]. The aim of this review, is to evaluate the different options available so far for removal of uterus and emphasis also given to consider alternatives to hysterectomy and to establish the most appropriate indications for its recommendation on the light of sound clinical decision making process for management.

Incidence and indications for hysterectomy : Incidence of hysterectomy is variable, depending on the socio-cultural status, national economy, geography, quality of life and standard of living. The rates differ considerably between countries[1]. The rates are coming down in western countries with the adoption of more conservative alternatives to hysterectomy, however it is still widely performed. The incidence rate has dropped by approximately 1% every decade since 1980; even so , almost 20% of women undergone hysterectomy by the age of 55 years.

Excluding malignancy, hysterectomy is commonly indicated in cases of abnormal uterine bleeding (Menorrhagia / DUB) is the most frequent cause for hysterectomy.Organic uterine pathology like myomas and adenomyosis as a case of menorrhagia is the leading cause for hysterectomy[5]. Whereas conservative levonorgestrel intrauterine device (LNG-IUD)and surgical (Myomectomy) alternatives are restricted for those who needs fertility preservation. Another common cause for hysterectomy is pelvic pain, mainly caused by endometriosis, and or adenomyosis and pelvic inflammatory disease (PID). Though these conditions could be managed temporarily by analgesics (e.g NSAID or paracetamol) and hormones for anovulation. In most of the cases hysterectomy may be proposed at one point of time. Uterine descent is another most common indication for vaginal hysterectomy, unless uterine conservation is mandatory[6,7]. Surgical approaches to Hysterectomy (Technique).The American College of Obstetricians and Gynaecologist's (ACOG) guideline or. The Royal College of Obstetrics and Gynaecology (RCOG) guideline for hysterectomy are most popular, widely followed[5,6]. Type of hysterectomy to be performed is determined by surgical indications, pelvic anatomic status, relevant clinical and laboratory findings, patient's preference and the surgeon's training and experience. Patient's age, parity, uterine size, pelvic mobility, past and existing pelvic pathology, any prior pelvic surgery and associated co-morbidity are the most important factors to take account[5,6].

Surgeon's skill and quality of their training and practices at the local facility is also a very important determining factors while considering a hysterectomy. Continuous training for manpower development and preparation and adoption of an effective institutional guidelines for hysterectomy operation is essential. Uterine size and mobility is the single most determining factors for many a surgeon for determining a particular approach. For a mobile uterus of less than 12-14 week gestational size (< 250-300 g) vaginal hysterectomy is the preferred approach in terms of operating times, febrile morbidity, demands for analgesics, fewer blood transfusion and reduction of hospital stay[7]. Uterine morcellation techniques are safe alternative for vaginal removal of big uterus done following either vaginal hysterectomy or laparoscopic assisted hysterectomy and are gaining popularity. For any degree of uterine prolapse vaginal hysterectomy with culdoplasty is the standard option, although a laparoscopic approach can also be feasible. For cases with suspected possible extrauterine pathology or adhesion (eg, Adnexal mass, endometriosis, pelvic inflammatory disease, previous pelvic surgery or cesarean section), laparoscopy should be employed for assisting correct pelvic dissection and adhesiolysis for successful completion of hysterectomy[8,9]. Lack of descent in nulliparity is a problem performing vaginal hysterectomy, dissection of the main supportive ligaments (uterosacral & cardinal) make the uterus mobile for successful vaginal hysterectomy, in cases of difficulty a laparoscopic assistance could be an alternative[10,11]. However, in reality, physicians are expected to adopt evidence-based practice guidelines that are cost-effective, feasible and defined by outcomes rather than physician preference or experience.

There are three main types of hysterectomy of common use are: Abdominal hysterectomy (AH), Vaginal hysterectomy (VH) and Laparoscopic[4]. There are various types of hysterectomy that are performed depending on the patient's diagnosis:

1. Abdominal Hysterectomy (AH) :

a. Supracervical / subtotal : with or without bilateral salphingoophorectomy

b. Total : with or without bilateral salphingoophorectomy

2. Vaginal Hysterectomy (VH): total hysterectomy with or usually without bilateral salpingo

3. Radical hysterectomy or modified radical hysterectomy – a more extensive surgery for gynecologic cancer that includes removing the uterus and cervix and may also remove part of the vagina, fallopian tubes, ovaries and lymph nodes in order to stage the cancer (determine how far it has spread).

4. Laparoscopic Hysterectomy (LH):

a. Laparoscopic assisted vaginal hysterectomy (LAVH) – where a vaginal hysterectomy is assisted by laparoscopic procedures that do not usually include uterine artery ligation.

b. Total laparoscopic hysterectomy (TLH) – hysterectomy is completely laparoscopic, suturing of the vagina is achieved by either by vaginal access or also laparoscopically. If the uterus is too large to be retrieved via the vagina is removed using a morcellator.

c. Laparoscopic supracervical hysterectomy (LASH) – Is conducted purely laparoscopically, the uterus is devided from the cervix and removed using a morcellator. The cervix is left " in situ".

Abdominal Hysterectomy (AH)

Abdominal hysterectomy, the most well established method, permits the surgeon to deal with any kind of pathology malignancy included, and has the benefit of the direct touch on the tissues. It also offers the benefit of the direct three-dimension visualization of the surgical field and additionally does not warrant expensive special instruments. Although, with the establishment of benefits of other alternative routes specially with the introduction of laparoscopy the role of abdominal hysterectomy is gradually waning. But it is still a widely practiced method in most of the centers specially with a low resource setting. It is still a preferable method for cases with bigger uterine size (> 12 weeks), gross pelvic adhesion, adnexal pathology, narrow vagina (nulliparity), little or no uterine descent. In any cases with previous pelvic surgery (caesarean section) or any extrauterine disease (endometriosis / adhesions / adnexal pathology) where vaginal hysterectomy is contraindicated, those cases can be safely resolved with the introduction of laparoscopic surgery. Any indication, if VH is not possible, LH is still preferable to AH, although there is a higher chance of bladder and bowel injury, depending on the learning curve of the surgeon.

Vaginal Hysterectomy (VH)

VH proved to be the standard, safe and cost-effective procedure for uterine removal in majority of the cases of benign pelvic pathology. There is a significant advantages in respect to both primary and secondary outcome following VH. Lower surgical mortality and fewer associated morbidity, shorter hospital stay, quick return to normal activity and improved quality of life remains the mainstay for preferring VH in place of AH. The main drawback to this approach (VH) are related to technical aspects of entrance to Pouch of Douglas via peritoneum in cases of adhesion, scrutinizing all the pedicle following hysterectomy, doing salphingo-ophorectomy and removing bigger uterus and performing vaginal morcillation. VH for pelvic malignancy and performing bilateral salphingo-ophorectomy are still a relative contraindication for this surgery in some places.

Laparoscopic Hysterectomy (LH)

laparoscopic approach is a valid alternative to AH and in those cases where VH is relatively contraindicated. It is not indicated for malignant disease due to the hazard of spreading malignant cells, there is no direct touch on the tissues and warrants specialized surgeons and expensive instruments and equipments. Visualization is in two dimensions which require familiarization with the technique. In spite of extensive clinical research and evidence available on the various approach for hysterectomy, the role of LH is still remain uncertain and difficult to define. Its ultimate role is to reduce the burden of AH and lncrease the rate of VH for their significant outcome. Initially laparoscopy was introduced for assisting vaginal hysterectomy in cases of both relative and absolute contraindications as already stated, but gradually it proved its advantages and accepted as a separate independent approach for hysterectomy. It has its role for both a complete laparoscopic hysterectomy or a laparoscopic assisted vaginal hysterectomy. LH has a significant advantages over abdominal hysterectomy in respect to shorter hospital stay, less post-operative pain and allows quicker recovery. Unlike VH, it need longer operation time, higher risk of injury to adjacent organs and higher direct cost. However, higher direct cost could be minimized by shorter hospital stay and lower post-operative analgesia and early resumption to activity. The most important issue related to LH that, it requires longer learning curve and greater surgical skills than vaginal and abdominal methods. But, the rate of hysterectomies performed are gradually increasing considering its advantages of a clear view of intra-abdominal and pelvic structures, thus allowing a more precise tissue dissection and thus facilitates management of adnexal pathology and pelvic adhesiolysis. However, the most important advantage of introduction of

laparoscopic training in gynaecology is confidence building and assisting in the development of vaginal surgery skills among practicing gynaecologists and make VH a more feasible option. In the learning curve.Initially a surgeon can choose minimally invasive laparoscopic approach as an alternative to AH and then for assisting vaginal hysterectomy followed by a gradual shift to vaginal hysterectomy.

Robotic surgery

Robotic approach offers the patients an another minimally invasive approach for performing hysterectomy and has been introduced in a very few centers since 2001. It is now gradually gaining attention by the surgeons because it has all the benefits of minimally invasive surgery. It offers a articulating wrist easier to handle, 3D vision, wide degree of freedom which make it easier to work in the pelvis and offers a perfect movements for suturing, excising and reconstructing. The most important advantage is that it is surgeons friendly in respect to protection of surgeons neck and hand and offers a virtual reality for them.

Surgical complications

Several studies and randomized control trials has been done comparing the complications related to each type of hysterectomy. Abdominal hysterectomy top the list for post-operative febrile morbidity , wound infections with their short and long term effects.

In most of the recent meta-analysis, urinary tract injury was significantly higher in LH than AH (odds ratio: 2.61), while no significant differences were found in LH versus VH (odds ratio: 1) or total LH versus LAVH. No significant difference was observed between other intraoperative visceral injuries (bowel or vascular) as a result of the surgical approach.

Impact on pelvic floor dysfunction

Conflicting results were found regarding the post operative andlong term pelvic organ function and support following different approaches of hysterectomy. It is obvious that, during hysterectomy both anatomical disruption and neuronal damage to pelvic organs occurs, which might alter pelvic organ function and support. Interestingly there is basic improvement of the quality of life and sexual function. following hysterectomy This is probably due to the indication for the hysterectomy, adhesiolysis and a withdraw from neuronal entrapment. There is no evidence that hysterectomy produces bowel dysfunction, or exerts a negative

influence on sexual function, rather there is improvement in their function. Simple hysterectomy doesnot adversely affect the urinary function rather a positive impact were observed in urinary function / incontinence following hysterectomy. The incidence of vault prolapse in a common concern, with a incidence of between 0.2 and 43%. It occurs more frequently in vaginal (10%) than abdominal approach (2%). In depth analysis reveals that, VH per se is not a risk factor for vault prolapse, indeed it is because vaginal approach frequently associated with some degree of prolapse.

Performing concomitant culdoplasty for strengthening might be a valid approach for reducing the incidence of its occurance.

Alternatives to Hysterectomy

Total hysterectomy was once upon a time considered as gold standard in the treatment of symptomatic uterine fibroids, menorrhagia, endometriosis, pelvic inflammatory disease (PID) in women without reproductive wishes. However an increasing number of patients asked for alternatives to hysterectomy.

Myomectomy, endometrial ablation, hormonal and other medical treatment, uterine artery embolization, intrauterine devise (LNG- IUD_and supracervical hysterectomy may be useful alternatives in the treatment of those cases in an individual patient. Though they are temporarily effective and often have important side effects . On the other hand, they have an tremendous impact in the improvement of patients general condition and quality of life and can in many of a cases has been cured awaiting a long cue for operation[7,8,9].

Medical approaches

Medical therapy for menorrhagia consists of prostaglandin synthetase inhibitors (nonsteroidal antiinflammatory drugs) or sexual steroid hormones (progestins or combination oral contraceptives). Antifibrinolytic drugs (such as tranexamic acid) are widely used for treating such cases as an alternative to hysterectomy.[12-16]. Gonadotropin-releasing hormone analogues treat menorrhagia and for the reduction of the size of myoma (35-65% reduction) within 3 months of treatment. It acts by reducing pituitary stimulation of the ovary and therefore inducing a pseudomenopausal state, but the manifestations of estrogen deficiency limit its long-term us, so that supplemental estrogen and progestin must be considered[17-23].

Mifepristone, an antiprogesterone agent has been proved to be effective in the reduction of myoma volume (26-74%) and thus controlling the symptoms related to myoma. Although amenorrhoea is a common adverse effect, further studies are required for this agent to be included in the management of menorrhagia[24,25].

Myomectomy

Myomectomy is the most important alternative surgical options for those where fertility preservation is the issue. Being a surgical approach, risks related to surgery will be there. Avoiding laparotomy and a shift towards laparoscopic or hysteroscopic excision need to be emphasized. Both these procedure has a good outcome. One of the risk of those procedure is unexpected hysterectomy for intractable haemorrhage[26-29].

Thermal endometrial ablation

Endometrial ablation has become an increasingly popular treatment for abnormal uterine bleeding since it is minimally invasive and successful ablation avoids chronic use of medications.

Endometrial ablation is the surgical destruction of the uterine endometrium lining. The endometrium must be destroyed or resected to the level of the basalis, which is approximately 4 to 6 mm deep, depending upon the stage of the menstrual cycle. They require previous endometrial preparation to reduce the endometrial thickness usually by a GnRh agonist[1,4,6,30,31]. It is not appropriate for women with endometrial hyperplasia or cancer, or those who wish to preserve their fertility. There are two distinct endometrial ablation techniques, either non-resectoscopic ablation (nonselective) or resectoscopic ablation (selective).

Selective procedure can be accomplished under hysteroscopic visualization, using a urological type of resectoscope, a rollerball or laser instruments to ablate or resect the endometrium. It can also be performed with a non-resectoscopic ablation device, which is inserted into the Uterine cavity and delivers energy to uniformly destroy the uterine lining.

Non selective or non-resectoscopic endometrial ablation techniques are more widely practiced than resectoscopic ablation, since they require less specialized training and often have a shorter operative time. Endometrial ablation is performed with a disposable device which is inserted into the uterine cavity and delivers energy to uniformly destroy the uterine lining. Current approved non-resectoscopic technologies used are bipolar radiofrequency (Novasure®); hot liquid filled balloon (ThermaChoice®); cryotherapy (Her Option®); circulating hot water (Hydro ThermAblator®); and microwave (Microwave Endometrial Ablation). These techniques are also referred to as global or second generation ablation.

Resectoscopic endometrial ablation — Endometrial ablation or resection performed under hysteroscopic visualization with resectoscopic electrosurgical instruments (eg, rollerball, wire loop, vaporizing electrode) or with laser. Endometrial resection is often referred to as transcervical resection of the endometrium.

Resectoscopic ablation methods are also referred to as standard or first generation ablation. The term hysteroscopic ablation is also sometimes used for these methods; however, this esignation would also include the circulating hot water non-resectoscopic technique, since it involves instilling water through a hysteroscope[1,4,2,32,33].

Levonorgestrel-releasing intrauterine device (LNG-IUD)

The LNG-IUD releasing intrauterine device is a new contraceptive method that combines the advantages of both hormonal and intrauterine contraception[28,29,30]. Its simplicity, efficacy and patient security offer a very attractive alternative to patients with hypermenorrhea, with or without myomas or adenomyosis either alone or also as its non-contraceptive health benefits. This has been demonstrated in studies with quantitative determination of menstrual blood loss. During the first year of use, the LNg IUD reduced menstrual blood loss by 90% from pretreatment levels.

The local release of LNG-IUD within the endometrial cavity releases levonorgestrel over a period of 5 years through a rate-limiting membrane (20 µg/day), results in strong suppression of endometrial growth as the endometrium becomes insensitive to ovarian estradiol. The endometrial suppression is the reason for a significant reduction of menstrual blood loss or amenorrhea and for the disappearance of dysmenorrhea[24,25]. The bleeding pattern during the use of the LNg IUD is characterized by reduction of the blood loss and in the number of bleeding days per cycle. During the first two to three months of use, however, irregular spotting is common. The removal of the device results in a quick return of menstrual bleeding and fertility. Meta-analysis of trials comparing LNG-IUD with first-generation endometrial ablation techniques have shown that satisfaction rates are similar, despite the former producing a smaller reduction of blood loss and lower amenorrhea rate. In this way, LNG-IUD is probably the best of the conservative approaches to treating menorrhagia[25,26,27,28].

Uterine artery embolization

Transcatheter bilateral uterine artery embolization is a relatively new conservative treatment of symptomatic myoma. It is a transcutaneous, X-Ray guided technique, performed by specialists in intervention-radiography. An angiography catheter is inserted in the uterine arteries through one of the two common femoral arteries. Particles of polyvinyl alcohol 300–500 µm are injected in boluses until blood flow has ceased. The catheter is then withdrawn from the uterine artery, and the procedure is then repeated with the contralateral uterine artery[36,37].

The mechanism of UAE is the irreversible ischemic necrosis of the fibromyomas caused by the crucial decrease of the blood flow, having as a result their necrosis, while the rest of the normal myometrium is capable of surviving[1,4,35,36].

The whole procedure takes place under intravenous anesthesia and lasts approximately one hour. Reduction of uterine and myoma size is one of the easiest and most objective measures of confirming the efficacy of this treatment using ultrasound scan or MRI. Patients can usually return to normal activities within 8–14 days[1,4,34,36]. UAE has emerged as the leading minimally invasive treatment for fibroids: Morbidity is low and recovery rapid; serious complications are quite rare. With a few anatomical exceptions, UAE is appropriate for most patients with symptomatic fibroids who have completed childbearing[19,35,37]. Although pregnancy is certainly possible after embolization[36,37] existing data suggest better reproductive outcomes for myomectomy in the first 2 years after treatment. The current recommendation is for myomectomy as a first choice for patients seeking to become pregnant[36,37].

MRI guided focused ultrasound (MRgFUS)

It is a new, minimal interventional method of thermal destruction of fibroids, where a high frequency ultrasound waves penetrate the anterior abdominal wall and focus in a specific target inside the fibroid increasing the temperature up to 55–90°C. This targeted treatment causes irreversible cell damage, leading to coagulative necrosis due to thermal and nonthermal effects produced in the exposed area.1,4 The simultaneous use of MRI allows the exact focus on the target and real-time temperature feedback. The technique demands special equipment, has to be performed by an expertised specialist and under intravenous anesthesia. Although few trials with this method have been reported until now, the results are encouraging[1,4,37].

Conclusion

Hysterectomy, remains the "gold standard" in the treatment of many uterine benign pathological conditions whatever the approach used (abdominal, vaginal, laparoscopic). With the advent of newer effective non-surgical or conservative fertility sparing, less invasive alternatives, its use gradually are declining. When this intervention is selected, a rational algorithm should be employed in clincial decisions in order for the best route to be selected. Although Gynaecologists should be trained in the three routes as a basic training needs. VH should be the first choice for many reasons, the most important of which are it's safety, lower complication rate, better cost–effectiveness and improved quality of life. The aim should be to avoid a laparotomy whenever possible and to encourage the modern technologies, as their results are promising and in many cases comparable with hysterectomy. However, in reality, physicians are expected to adopt evidence-based practice guidelines that are cost-effective, feasible and defined by outcomes rather than physician preference or experience.

Disclosure

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