

Total Laparoscopic Hysterectomy

R. Rajan

Namitha, P.O. Amalagiri, Kottayam-686036



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History

Hysterectomy has a long history, with the first vaginal hysterectomy reported in 1813, and the first elective abdominal hysterectomies in 1863. These two operations were constantly refined over the remainder of the 19th century and by the mid portion of the 20th century, had become established as the classic techniques (Sutton 1997). Since the middle of this century, however, there were no substantial changes in the classic techniques of either abdominal or vaginal hysterectomy until the first laparoscopic hysterectomy using only laparoscopic technique was performed in January, 1988 by Harry Reich (Reich et al., 1989). The first laparoscopic supracervical hysterectomy was reported by Semm in 1991 (Semm, 1991.) Since that time, several large series have been reported including 500 cases by Donnez et al., 1997) with no complications and very rapid recovery. In 1998 Charles Koh reported the popular series of total laparoscopic hysterectomy.

Modern Trends

In modern times, there is a compelling need for continuous refining of the technique of hysterectomy aiming at avoiding traumatic, hemorrhagic and infective morbidity, speedy

recovery with minimal hospitalization, early return to work, and thus providing quality health (Kovac, 1997, Steege, 1997). Laparoscopic Hysterectomy, particularly the total laparoscopic hysterectomy is fast trying to fulfill all these goals.

A great proportion of hysterectomies are done completely laparoscopically and is much less traumatic than vaginal hysterectomy (VH), laparoscopically assisted vaginal hysterectomy (LAVH) or total abdominal hysterectomy (Koh, 1998). Such total laparoscopic hysterectomy (TLH) approach is surgically elegant but technically difficult. The benefits of TLH over TAH and LAVH include significantly reduced risk of surgical injuries, less pain, earlier ambulation, and shorter recuperation (Reich et al., 1989). According to Koh (1998), TLH has the potential to become the method of choice over the currently popular LAVH.

Laparoscopic Hysterectomy — Definitions

1. Diagnostic laparoscopy with vaginal hysterectomy: Laparoscopic inspection to determine feasibility of vaginal hysterectomy when indications for vaginal hysterectomy are equivocal. It also ensures that the pedicles are normal and hemostasis is complete (Reich, et al., 1989).
2. Laparoscopy assisted vaginal hysterectomy (LAVH): After laparoscopic adhesiolysis and if necessary oophorectomy (occasionally even myomectomy) vaginal hysterectomy is completed. After transection of the broad ligament the bladder is mobilized and either both or one of the vaginal walls will be opened and rest completed vaginally. The uterine vessels are not transected laparoscopically.

3. Laparoscopic hysterectomy (LH): In this procedure the uterine artery is also transected laparoscopically. The steps after ligation of uterine artery are either completed vaginally or by laparoscopy (Nezhat, et al., 1997).
4. Total Laparoscopic hysterectomy (TLH): The entire surgery is completed laparoscopically and the uterus is removed through the vagina. No vaginal surgery is done unless there is need for morcellation.
5. Laparoscopic supracervical hysterectomy (LSCH): After necessary adhesiolysis and ovarian removal (if mandatory) the broad ligaments are divided and uterovesical peritoneal fold is opened. The bladder is not mobilized, and instead after bipolar desiccation and transection of the ascending uterine artery at the level of the internal os the uterus is removed by a circumferential incision at the same level. (Pelosi, 1992) The uterus is removed by morcellation or posterior colpotomy.
6. Laparoscopic pelvic reconstruction (LPR) with VH: This method is useful when VH alone cannot accomplish appropriate repair of pelvic supports.
7. Abdominal hysterectomy: This is the "default operation" suited for any situation where hysterectomy cannot be completed by other methods or where hysterectomy by other routes will be difficult. Big pelvic masses (particularly uterine myoma upto or above the umbilicus) are almost clear indications for abdominal hysterectomy. LSCH should be the choice if preservation of cervix is necessary (particularly hysterectomy in early 40's) (Johns 1997) and the surgical choice for pelvic descend is vaginal hysterectomy and PFR.

Surgical Flexibility

The early results with TLH are encouraging and it is possible for a gynecological surgeon to safely add TLH to his surgical armamentarium on condition that he is well familiar with the performance of LAVH. In turn, for a surgeon to be proficient in LAVH he ought to be good vaginal surgeon capable of

performing vaginal hysterectomy for non-descend uterus. So much so, at any stage if he encounters difficulty he must be able to convert TLH to LH or LAVH, and seldom he may be called upon to complete hysterectomy by the abdominal route (the default operation). LSCH should be the choice if preservation of cervix is necessary (particularly hysterectomy in early 40's) (Johns 1997) and the surgical choice for pelvic descend is vaginal hysterectomy and PFR.

Technique of total Laparoscopic Hysterectomy

After proper inspection of the pelvic organs and the peritoneal folds the uterus is elevated and rotated to one side to stretch the infundibulo-pelvic fold and round ligament of the opposite side. This favors the easy bipolar desiccation of these structures. Following desiccation the tubo-ovarian pedicle and the round ligament are divided by monopolar cutting current or the scissors. Division of these ligaments very close to the uterus must be avoided to prevent bleeding from the uterine side. Following these steps the parametrium is opened bilaterally. After dividing the broad ligament on both sides the uterus is elevated and retroverted to bring the uterovesical fold under clear vision.

With empty bladder, the uterovesical peritoneum is lifted up and divided transversely. The bladder is dissected down by sharp and blunt dissection. The CCL extractor bulging the anterior fornix facilitates the bladder dissection. At this stage the pubovesicocervical ligament (bladder pillars) could be delineated on both sides extending between the lateral bladder wall and upper cervix. These ligaments are carefully desiccated using bipolar cautery and cut completely freeing the bladder from the cervix and upper vagina. This step displaces the bladder considerably down and laterally, a step that is vital for keeping the bladder and ureters away from the area of surgery. Proper displacement of the bladder exposes from the area of surgery. Proper displacement of the bladder exposes nearly 2 cms of the anterior vagina which is seen bulging under the

pressure of the CCL extractor.

The CCL extractor with the dilator or uterine manipulator with the colpotomizer can be employed for proper manipulation during the surgery. Strong cephalad elevation of the uterus stretches the vagina thus distancing the vagina from the ureter. The uterus is elevated and rotated to the right to coapt and ligate/desiccate the uterine vessels on the left, and vice-versa. By this approach the ureter is distanced for more than 2 cms from area of surgery. To create even greater distance the CCL extractor or the cup of the colpotomizer is pushed further against the fornix, thereby lengthening the vagina and pushing the vessels upward. By pushing the vaginal fornices and the lateral overlying uterine vessels upward, vessel desiccation and colpotomy occur more than 2 cm from the ureters. Knowledge that the left uterine vessels are placed slightly anterior and right ones slightly posterior will further facilitate precise and safe dissection of these vessels.

The uterine vessels could be divided safely by one of the following four methods:

1. With the uterus kept retroverted and anterior fornix stretched by the CCL extractor or the colpotomizer the anterior vagina is incised transversely with unipolar hook or spatula at 90 watts of unmodulated current. The vaginal incision is extended laterally stopping short of the uterine vessels. Bipolar desiccation helps to control cuff bleeders. Next the uterus is acutely anteverted and posterior fornix is stretched by the CCL extractor or the colpotomizer. Posterior transverse incision is made at the top of the stretched posterior fornix sparing the uterosacral ligaments and the posterior vagina to which these ligaments are attached. Now the right vaginal fornix is stretched to facilitate the ligation or suturing of the right uterine vessels. By maintaining pressure and elevation of the lateral fornix the ureter is completely distanced from the uterine vessels. Using the unipolar hook or scissors the uterine vessels are divided. After division of uterine vessels on both sides the lateral vaginal fornices are divided on the left and right sides to complete the colpotomy incision. During

this critical stage of the operation, pneumoperitoneum is maintained by occlusion of the vagina. As a result, the anatomy is clearly visible, hemostasis is unhurried and thorough and vaginal closure is accomplished (Koh, 1998).

2. After completion of the anterior and posterior incisions the uterus is held attached only by the two lateral fornices. These two lateral vaginal walls along with the uterine vessels could be ligated and divided by unipolar cutting current.
3. Before opening the vagina, and after transection of the bladder pillars and complete mobilization of the bladder, the uterus could be elevated and rotated to right side bringing the left parametrium into prominence. The left uterine artery could be skeletonized and sutured, the same step is repeated on the right side. Next the vessels are bipolar desiccated and cut with monopolar hook/spatula or scissors to free lateral borders of the uterus. After safely securing the uterine vessels on both sides the circumferential incision could be made beginning on the anterior vaginal wall, extending laterally and passing through the vaginal interface to posterior cervix.
4. After opening the anterior vagina in a curvilinear fashion the bipolar forceps could be inserted at the lateral edges of the incision in the upward direction towards the interface of the cervix with the lateral vaginal wall. The tissue held is meticulously desiccated and divided. This step is alternated on both sides and repeated until the parametrium and uterine vessels on both sides have been completely transected. Now the uterus remains attached to the vagina by the posterior fornix and both utero-sacral ligaments. Next the posterior cervical interface is desiccated with bipolar cautery above the attachment of the uterosacral ligaments and vagina, and the uterus detached completely.

Harmonic scalpel has been found to be extremely helpful in transection of the various structures at TLH. The advantages are a quicker approach with relatively avascular dissection and perfect hemostasis. Moreover this technique is devoid of complications.

Advantage and Limitations of various types of Hysterectomies

Comparisons	LSCH	TLH	LAVH	VAG. HYS	ABD. HYS
Duration of surg	< 60 mi	- 120 m	- 75 m	- 45 min	- 60 min
Trauma	least	less	more	more	high
Blood loss	- 100ml	- 150 ml	-200 ml	- 200 ml	- 250 ml
Uterosacral injury	nil	nil	injured	injured	injured
Pelvic innervation	intact	intact	affected	affected	affected
Post. Vag. Length	10.5 cm	10.5 cm	7 cms	7 cms	7 cms
Vaginal suturing	nil	everted	inverted	inverted	everted
Post. op. pain	minimal	minimal	minimal	minimal	more
Spon. Urination	in 5 hrs	in 5 hrs	in 5 hrs	in 5 hrs	delayed
Ambulation	in 5 hrs	in 5 hrs	in 5 hrs	in 5 hrs	delayed
Oral intake	< 6 hrs	< 6 hrs	< 6 hrs	< 6 hrs	delayed
Post op. recovery	V. rapid	V. rapid	rapid	rapid	delayed
Vault morbidity	Nil	minimal	less	less	more
Hospitalization	1 day	2 days	2 days	2 days	7-10 days
Return to work	1 week	2 weeks	2 weeks	2 weeks	4— 8 wks
Bladder injury	nil	minimal	less	more	more
Ureteric injury	nil	minimal	less	more	more
Rectal injury	nil	minimal	less	more	more
Coital function	normal	affected	affected	affected	affected

Advantages of TLH

The benefits of TLH include least surgical trauma, significantly reduced blood loss, reduced risk of injuries to other organs, shorter recuperation, less pain and earlier ambulation. The uterosacral ligaments and posterior vagina are not transected and hence pelvic innervation is unaffected, possibility of vault prolapse is reduced and posterior vaginal length is preserved. Moreover, since vaginal suturing does not involve inversion of the edges as in LAVH or VH postoperative vaginal length is minimally affected. In situations where vaginal approach is difficult TLH is the method of choice.

References

1. Donnez J, Nisolle M, Smets M, Polet R, Bassil S: *Gynaecological Endoscopy* 6: 73, 1997.
2. Koh, C.H.: *J Am Assoc Gynecol Laparosc.* 5: 187, 1998.
3. Kovac SR. *Obstetrics and Gynecology* 85: 18; 1997.
4. Johns, A.: *Clin. Obst. Gynec.* 40: 903, 1997.
5. Nezhat, C.R., Nezhat, F.R., Luciano, A.A, Siegler, A.M., Metzger, D.A., and Nezhat, C.H.: *Operative laparoscopy — Principles and Techniques* McGraw-Hill Inc. New York. 2nd Ed. 1997 p. 205.
6. Pelosi, M.A., : *J. Reprod. Med.* 37: 777, 1992.
7. Reich H, Decaprio J, McGlynn F. *Jornal of Gynecologic Surgery.* 5: 213, 1989.
8. Semm K. *Geburtshilfe und Frauenheilkunde* 51: 996, 1991.
9. Steege, J.F.: *Clin. Obst. Gyn.* 40: 878, 1997.
10. Sutton C. *Balliere's Clinical Obstetrics and Gynaecology* 11: 1-22, 1997.