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Original Article

Obstetrics and Gynaecology Section

Abdominal Hysterectomy: A New Approach for Conventional Procedure

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ABSTRACT

Objective: The present comparative study helps in developing a new approach to conventional hysterectomy procedure so as to prevent intra-operative and Post-operative complications during the procedure.

Materials and Methods: Ligation of uterine and ovarian arteries was performed, prior to abdominal hysterectomy procedures, in Group A (n-1000) and conventional method of abdominal hysterectomy in Group B (n-450) from January 2000 to December 2009. It was a prospective study.

Results: In Group A it was noted that traumatic injury to (L) uterine vessel was present in 4 (0.4%) cases and (R) uterine vessel in 3 (0.3%) cases without any noticeable injury to the ovarian vessels, ureters or bladder as compared to in Group B where injury to (L) uterine was noted in 11 (2.4%) cases, ureters in 1 (0.1%) case, bladder in 6(1.3%) cases, hematoma in 10 (2.2%).

Post-operative complications were found to be uneventful in Group A.

Conclusion: The Present study concludes that ligation of uterine and ovarian arteries, prior to conventional abdominal hysterectomy procedures is found to be extremely safe procedure thereby reducing the risk of intra-operative and post- operative complications.

Keywords: Abdominal hysterectomy, Ligation, Uterine artery

INTRODUCTION

Abdominal hysterectomy is one of the most commonly performed gynaecological operative procedures. The major conditions indicated for abdominal hysterectomy to be performed are- dysfunctional uterine bleeding, fibroid uterus, endometriosis and cervical intraepithelial dysplasia etc. The patients usually suffer from moderate to severe anemia due to chronic blood loss in absence of the proper treatment.

In conventional method of abdominal hysterectomy during operative procedure, haemorrhage caused by trauma or slipping and retraction of uterine arteries, ovarian arteries and injury to the ureters are of great concern to a gynecologist working especially in rural settings where there infrastructure and facilities like blood transfusion etc are not available easily.

To overcome such problem we have developed a new well-designed scientific approach i.e. during the operation- ligation of uterine and ovarian arteries (in case of salpingo – oopherectomy) are performed prior to performing routine conventional hysterectomy.

MATERIALS AND METHODS

This comparative prospective study was undertaken at Multicare hospital and J.N.M hospital, Kalyani West- Bengal, India during the period from January 2000 to December 2009. During this period 1000 abdominal hysterectomy operations were performed by this procedure (Group A) and 450 (Group B) by conventional method.

Surgeon is highly competent in both conventional technique as well as the new technique and has done >5000 cases. Informed consent was taken.

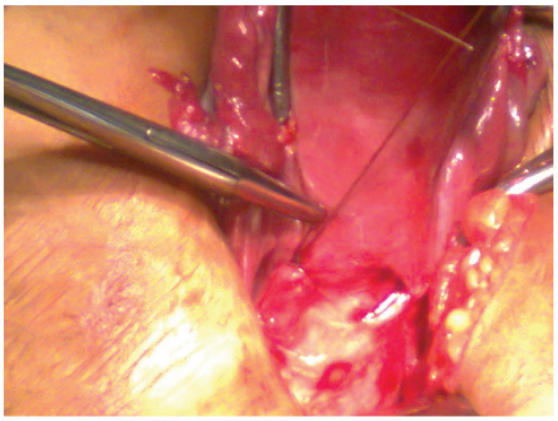
The patient was carefully prepared following all standard precautions for the procedure:

Operative Technique

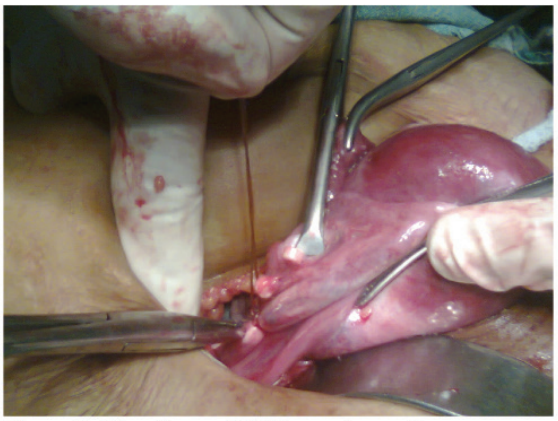
- After satisfactory general or spinal anaesthesia, cleaning and draping, an indwelling catheter was placed in the bladder for continuous drainage. A careful pelvic and rectovaginal examination was done.
- Abdomen was opened either by transverse or para-median incision. Abdominal and pelvic cavities were evaluated properly to find out any other concealed pathology.
- Palpation of the lower portion of the pelvic ureter was done after exposing the pouch of Douglas.
- The anterior leaf of broad ligament is incised from right to left round ligament. Wide mobilization and displacement of the bladder base from the cervix were done.
- The posterior leaf of the broad ligament was incised down to the point where the utero – sacral ligament join the cervix.
- Uterus was then pulled up by vulsellum, two fingers were put posteriorly 1 cm. above the uterine attachment of utero-sacral ligament and 1 cm. lateral from the uterine wall followed by lifting of the posterior broad ligament for exposing uterine artery. Uterine artery was completely skeletonised and exposed. Uterine artery was ligated by atraumatic 1-0 or by absorbable 1-0 suture – A1 (primary step).
- The same procedures were repeated in opposite side.
- In case of salpingo – oopherectomy-(a) ligation of ovarian vessels along with infundibulo- pelvic ligament (B1) by atraumatic 1-0 or any other suture were done first to be followed by (b) clamping, cutting and ligation of the ovarian vessels and infundibulopelvic ligament (B2).
- In case of total abdominal hysterectomy clamping, cutting and ligation of the uterine end of the fallopian tube, mesosalpinx, ovarian branches of uterine artery, utero-ovarian ligament were performed.
- Final step for clamping of uterine artery – two clamps were applied – first one is placed at the level of the internal Cervival Os closed to the uterus. Second – placed at right angles to the first clamp.
- The uterine vessels were cut using scalpel between the first and second clamp and followed by freeing of uterine vessels

Steps of Operation for New Improving Surgical Technique

Step - 1, Separation of the bladder fold

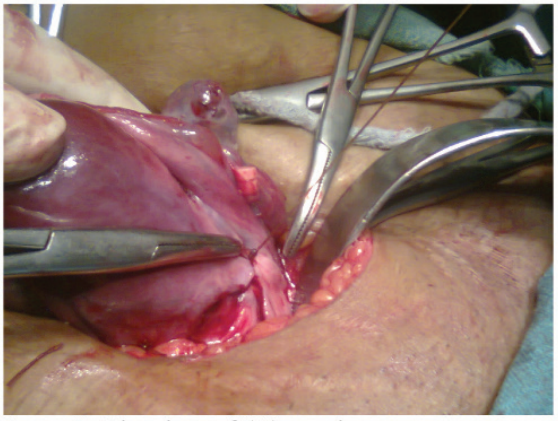


Step -2, Ligation of (R) uterine artery

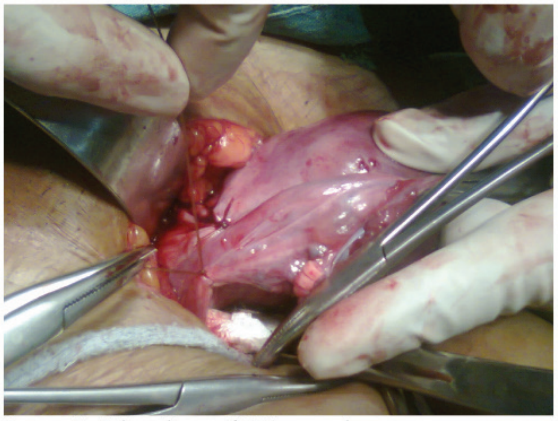


Step -3, Ligation of (R) ovarian artery

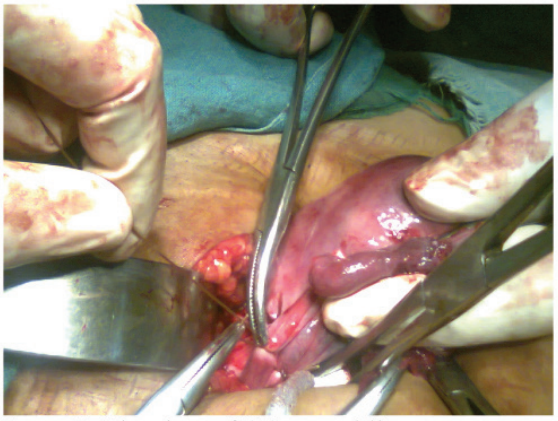
Step -4, Ligation of (R) round ligament



Step -5, Ligation of (L) uterine artery



Step -6, Ligation of (L) ovarian artery



Step -7, Ligation of (L) round ligament

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[Table/Fig-1]: Steps of operation for new improving surgical tech

from uterus by extending the incision around the tip of the lst clamp – ligated by transfixation chromic catgut-1 or 1-0 vicryl (A2) along with surrounding tissue of the uterine wall – to be followed by re-suturing the uterine vessels with surrounding tissue (A3) (triple ligation).

- Same procedure was carried out in opposite side.
- Mobilization of peritoneal flap from its attachment to the cervix upto posterior vaginal fornix was performed.
- Both utero-sacral ligament clamped, incised and ligated with chromic catgut No.1.
- A plane between the cervix and vaginal wall anteriorly and anterior rectal wall and vagina posteriorly was made.
- T-shaped incision was made in the fasciae anterior to the cervix just below the level of the internal cervical os & uterine vessels were ligated.
- Clamping and cutting was performed followed by ligation of cardinal ligament (both sides) was done using chromic catgut-1 suture.
- Opening of anterior vaginal fornix, cutting of posterior and lateral vaginal wall, removal of uterus along with the cervix, were followed by vagina closure using interrupted sutures using chromic-1-catgut.
- The floor of pelvis was peritonised.
- Abdomen was closed in layers.

STATISTICAL ANALYSIS

Epi info software was used for statistical analysis. Results are expressed in absolute numbers and proportions. Chi-square test was used to test the significant difference between two groups. P-Value of 0.05 or less was considered to be statistically significant. All statistical tests applied were two-tailed.

RESULTS

[Table/Fig-1], [Table/Fig-2], [Table/Fig-3], [Table/Fig-4]

Dysfunctional	Group-A(n-1000)	Group- B(n-450)
Uterine bleeding	550 (55%)	244 (54.2%)
Fibroid uterus	340 (34%)	174 (37.8%)
CIN III	40 (4%)	5 (1.1%)
CIN II	10 (1%)	4 (.9%)
Endometriosis	40 (4%)	10 (2.2%)
Carcinoma-in-situ	20 (2%)	17 (3.8%)

[Table/Fig-2]: Indication for hysterectomy

Types of operation	Group-A (n-1000)	Group-B (n-450)
Total abdominal Hysterectomy	120 (12%)	115 (25.6%)
Total abdominal Hysterectomy with both sided salpingo – oopherectomy	780 (78%)	245 (54.4%)
Total abdominal Hysterectomy with one sided salpingo-oopherectomy	100 (10%)	90 (20%)

[Table/Fig-3]: Types of operations

Injury to	Group-A (n-1000)	Group-B (n-450)	P-value
(l)uterine vessel	4 (.4%)	11 (2.4%)	0.001
(r) uterine vessel	3 (.3%)	9 (2%)	0.001
(r) ovarian vessel	nil	_	0.001
(r) ovarian vessel	nil	_	0.001
Ureter	nil	1 (.1%)	0.001
Bladder	nil	6 (1.3%)	0.001
Large intestine	nil	1 (.1%)	0.001
Small intestine	nil	5 (1.1%)	0.001
Omentum	nil	3 (.7%)	0.001
Haematoma	nil	10 (2.2%)	0.001
Internal iliac ligation (L)	nil	29 (.4%)	0.001

[Table/Fig-4]: Operative complications

DISCUSSION

Abdominal hysterectomy is performed, for various gynecological etiologies. The patients are found usually suffering from moderate to severe anemia due to chronic blood loss in the absence of proper procedure performed [Table/Fig-1,2].

In present gynaecological practice, abdominal hysterectomy with or without salpingo- oopherectomy is done conventionally [1-3] from above downwards i.e. by clamping, cutting and ligating the round ligament/ infundibulopelvic ligament (depending on type of operation), uterine end of the tube, and utero-ovarian ligament, followed by mobilization of bladder, exposing the uterine vessels for clamping, cutting and ligation [Table/Fig-2,3], which is further followed by clamping, cutting and ligation of utero-sacral ligament, vaginal vault etc. respectively (both sides).

During conventional method of abdominal hysterectomy, as observed from this study, there may be traumatic injury to the vessels or slipping and retraction of uterine arteries and ovarian arteries [Table/Fig-3,4]. If it happens during operative procedure, there may be possibility of trauma to the ureter 1(0.1%), bladder 6(1.3%), small intestine 5(1.1%) and omentum 3(0.7%) etc due to prior inexperience of handling such emergency situations such as hematoma 10(2.2%) which is further aggravated by fear psychosis leading to unnecessary clamping in an unwanted area [Table/Fig-2,3].

Therefore, to avoid such unwanted medical anomaly a better approach has been developed i.e. ligation of uterine and ovarian arteries (in case of salpingo-oopherectomy) were performed prior to conventional hysterectomy procedure [4,5] as described in different standard surgery books.

It is very much important to know the anatomy of uterine artery and its course, pelvic ureter and bladder and lastly relationship between uterine artery and ureter, before proceeding to use such better technique [Table/Fig-3,4].

During operative procedure – with retraction of uterine corpus, ureters on both sides will usually fall 2 cm. to 3 cm. laterally and inferior to the point of ligating uterine artery. Wide mobilization and displacement of bladder base from the cervix were done following separation of utero-vesical fold of peritoneum. The posterior lip of broad ligament incised, uterus is pulled up by vulsellum, two fingers were put posteriorly up to 1 cm. above the uterine attachment of the uterosacral ligament and 1 cm. lateral from the uterine wall followed by lifting of the posterior broad ligament for exposing the uterine artery. Uterine artery were completely skeletonised and exposed and ligated by atraumatic 1-0 with 30mm. needle or by absorable 1-0 suture – A (primary step).

It is also important to ligate the ovarian vessels along with infundibulo pelvic ligament (B1) by atraumatic 1-0 or vicryl (In case of salpingo-oopherectomy) to prevent slipping and retraction of ovarian vessels, which is to be followed by clamping, cutting and ligation of ovarian vessels along with infundibulopelvic ligament (B2) by chromic-1 catgut. Clamping, cutting and ligation of round ligament along with mesosalpinx (B3) were done by transfixation suture (chromic – 1) which is ultimately passes B1 and B2 (Triple ligation)

Outmost care is to be taken while clamping the uterine arteries. First clamp is to be placed at the level of internal cervical Os close to the uterus whereas second clamp is placed at right angles to close to first clamp to be followed by cutting of ligated (A1) uterine vessels with the scalpel in between 1st and second clamp upto the tip of 1st clamp – ligated by transfixation suture (chromic catgut – 1), or vicryl 1-0) (A2) along with the surrounding tissue of the uterine wall – which is to be followed by resuturing of A1 and A2 (A3) (triple ligation).

Following this step – conventional hysterectomy procedures were advocated following all scientific instructions involved. Also care

was to be taken while tightening the vaginal wall to secure proper haemostasis.

In the present series, total abdominal hysterectomy with both sided salpingo–oopherectomy were performed in most of the cases – 78% (780) whereas 12% (120) cases had undergone total abdominal hysterectomy and 10% (100) had total abdominal hysterectomy with one sided salpingo–oopherectomy.

In conventional hysterectomy procedures, operative complications such as trauma or slipping and retraction of uterine artery and ovarian artery leading to haematoma is very much significant as reported by various authors [6-8] from time to time. Also there may be injury to ureter [9-11], bladder, intestine and omentum [12,13] etc. which usually happens while dealing with haematoma and haemorrhage like situations during such operative procedures.

In present series [Table/Fig-1] (image 1-4) no traumatic injury left and right ovarian vessels, ureter and bladder omentum and intestine were reported except in 4 (.4%) cases which had traumatic injury to (L) uterine vessel and 3 (.3%) cases with right uterine vessel which was managed immediately. This has got no significance statistically.

The demerits following this operation were (1) Occasionally there may be traumatic injury to uterine and ovarian vessels (2) anatomical variation of uterine or ovarian or aberrant artery may cause problem (but not seen in this series) (3). Broad ligament fibroid-10 (1%), endometriosis-40 (4%), severe adhesion and fixed uterus 80 (8%), rarely seen, may cause operative problem most of the cases can be managed by present technique. Only 2 (.2%) broad ligament fibroid, 10 (1%) endometriosis and 20 (2%) cases of fixed uterus with adhesion were undergone conventional method of abdominal hysterectomy procedure till the region of uterine artery reach where uterine artery was properly exposed, skeletonised and ligated to prevent slipping and retraction of uterine artery prior to traditional clamping of uterine vessels. (4) lastly accidental ligation of ureter if happens may sometimes cause problem.

Main merits of this operation were:

1. No slipping and retraction of uterine and ovarian artery.
2. Minimum blood loss.
3. Avoids unnecessary clamping while dealing with hematoma and hemorrhage like situations.
4. Avoids ureter, bladder or intestinal injury.
5. Good & safe for naive gynecologist in rural settings.
6. Enhanced & Better outcomes & recovery.
7. Reduced length-of-hospital-stay.

CONCLUSION

It may be concluded from this study that ligation of uterine and ovarian arteries prior to conventional abdominal hysterectomy is an extremely safe procedure, reducing the risk of intra-operative and post-operative complications.

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