

Vaginal Hysterectomy Using Electrocautery and Purohit Approach To Uterine Artery

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OBJECTIVE - To evaluate safety and feasibility of electrocautery in vaginal hysterectomy and of Purohit approach to uterine artery. **METHODS** - In a prospective study vaginal hysterectomy was carried out on consecutive 130 women for different benign diseases excluding endometriosis; uteri of upto 20 weeks size were included. Monopolar cautery of 30-35 watts to incise vaginal wall and bipolar cautery of 45 watts to desiccate lateral attachments of uterus and their division by scissors were our primary techniques. Post-hysterectomy laparoscopy was done randomly in 30 cases to view operation sites. **RESULTS** - vaginal hysterectomy was accomplished in all cases. There was no major electrical injury. Bleeding was less than 100 ml in 86.92% cases. Mean operating time was 83.50 mins. No major intraoperative and postoperative complications occurred. Postoperative pain was less. Mean hospital stay was 69.78 hours (2.9 days). No patient needed readmission. **CONCLUSION** - Vaginal hysterectomy using electrocautery is feasible, safe and effective even for large uteri of up to 20 weeks.

Key words : vaginal hysterectomy, Purohit approach to uterine artery

Introduction

The background of above downwards shaving of the attachments of the uterus during total laparoscopic hysterectomy¹ using electrocautery and scissors stimulated us to start the below upwards shaving of the attachments of the uterus using electrocautery and scissors during vaginal hysterectomy. Because of the utilization of many non-insulated retractors during vaginal hysterectomy and because monopolar current causes unintended electrical injury and bipolar current spreads laterally about 3-5 mm² we wanted to study the safety and feasibility of electrocautery in vaginal hysterectomy and to evaluate a special technique developed by us for an easy and obvious access to secure uterine artery. We also did post hysterectomy laparoscopy to confirm the safety of our technique.

Methods

A prospective study was conducted in our urban private hospital with observations for intra and postoperative complications, organ injury, need for blood transfusion, conversion to abdominal route, operative time, postoperative pain, duration of hospital stay and need for readmission.

One hundred and thirty consecutive women, between 20-65 years of age admitted between Nov 1997 and July

2000, for vaginal hysterectomy, with or without additional procedures, for different benign diseases of the uterus were included in the study. (Table I). Cases with uterine size of upto 20 weeks were included in the study irrespective of parity, obesity, descent of uterus and history of previous obstetric or gynecological operations. Known cases of endometriosis were excluded.

Vaginal hysterectomy was conducted by our technique as described below under general or spinal anaesthesia. Monopolar cutting current (30-35 watts) was used to incise vaginal wall and bipolar current (45 watts) was used to coagulate ligaments, vessels, tubes and other lateral attachments of the uterus. The coagulated tissues were transected within the coagulated area as advocated by Luciano et al³.

Operative Technique

Vaginal hysterectomy was commenced in the standard manner. 1: 200000 adrenaline was infiltrated locally. The anterior vaginal wall was incised by monopolar cutting, current of 30-35 watts. Bladder was separated from the cervix. Anterior cul-de-sac peritoneum was kept intact until uterine arteries were secured extraperitoneally. The posterior vaginal wall was incised by cutting current. Holding the incised posterior vaginal wall by Allis forceps by one hand, the index finger of other hand was used to push up the peritoneum of POD. Posterior cul-de-sac peritoneum was kept intact. The speculum was enhanced further. After adequate traction on cervix and counter traction with bladder retractor anteriorly and speculum posteriorly the lateral vaginal walls were stretched and incised to expose the ligaments on either side. Suction cannula was used to remove the blood during operation.

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The vesicocervical, cardinal and uterosacral ligaments were desiccated in smaller bites close to their attachments to the cervix using bipolar current (45 watts) through an ordinary bipolar forceps and divided by scissors. The desiccation was started from the vesicocervical ligament and moved backwards. We did not use clamps nor suture at that stage. Bleeding vessels were coagulated. The divided end was then pushed by index finger along the lateral uterine wall in the direction of ascending branch of uterine artery to expose the bulge of the tubular uterine artery.

The bulge of the artery was hooked from its posterior aspect inserting the tip of the right angle forceps between it and the uterine wall, stretched, spread between the prongs opening the tips of right angle forceps and then desiccated with bipolar current passed through an ordinary bipolar forceps or a standard laparoscopic bipolar forceps inserted between the prongs of right angle forceps and divided by scissors. This approach is termed as Purohit approach to uterine artery by us. We did not use clamps. Ordinary bipolar forceps was preferred for achieving better compression of vessel walls and coaptation than the spring operated laparoscopic bipolar forceps. Two to three sites of coagulation on the arterial wall were better for achieving effective hemostasis. Bleeding artery if any could be held by one artery forceps and its proximal part could be coagulated to achieve complete hemostasis. The divided end of the uterine artery with soft tissue was pushed upwards and outwards by index finger. The procedure was repeated on the opposite side. Now, posterior cul-de-sac peritoneum was incised. The posterior peritoneal folds on either side were desiccated and incised to enhance the descent of the uterus. Then the anterior cul-de-sac peritoneum was incised and the round ligament, ovarian ligament and the tube on either side, were desiccated by bipolar current and incised by scissors in stages to complete the hysterectomy. Right angle forceps was often used to hook the target tissues usually from the posterior aspect and occasionally from anterior aspect. No clamp or suture was used up to this stage.

After adequate retraction of incised vaginal walls by retractors the tip of desiccated Mackenrodt's ligament on either side was exposed and pulled by Allis forceps and was fixed to vaginal vault by vicryl no. 1 and the vault was also closed by vicryl no. '1'.

Post-hysterectomy double puncture laparoscopy was done randomly in 30 cases to evaluate the desiccated stumps and to see the electrical injury if any per abdomen. Routine vault drainage was used for 12 hours. Continuous catheterization by an infant feeding tube no. 9 fixed to the medial side of thigh and connected through a sterile infusion set into the urobag was employed. Prophylactic antibiotics were given.

Knife was used for bi-section and morcellation of large uteri and for myomectomy by conventional volume reduction techniques⁴. Telescope (10 mm) with light source was occasionally used to illuminate the deeper sites like round ligament, ovarian ligament, tube and infundibulo-pelvic ligament. Occasionally the cut end of the bleeding uterine artery was caught by artery forceps and its proximal part was desiccated.

Results

Mean age of 130 women was 41.88 years ranging from and 20 to 65 years. Maximum weight was 105 kgs. Indications for vaginal hysterectomy were mainly dysfunctional uterine bleeding (30%) and fibroids (22.30%) (Table I). Uterine size and operating time are given in Table II. Vaginal hysterectomy was successfully done in all cases.

Table I: Indications

Indications	No N = 130	Per- cent
DUB	39	30
Fibroid uterus	29	22.30
Chronic cervicitis	18	13.84
Adenomyosis	14	10.76
Uterine prolapse	13	10
PID	7	5.38
Intrauterine polyp	6	4.61
Cervical polyp	2	1.53
Fibroid with early pregnancy	2	1.53

Table II: Uterine Size and Operating Time

Size in weeks	No N=130	%	Mean time in minutes
Less than 8	67	51.53	76.46
8 - 10	34	26.15	95.83
10 - 12	24	18.46	90.78
12 - 20	5	3.86	126

There was no major electrical injury to the neighboring organs except minor superficial burn of less than 5 mm size to vulval skin in 5 cases (3.86%). There was no retraction of uterine artery. Intraoperative bleeding was less than 100 ml in 86.92% cases. Two cases (1.53%) had blood loss of about 700 ml and required blood transfusion (Table III). Post-hysterectomy laparoscopy showed no bleeding stumps and no organ injury. The stumps were well desiccated and looked similar to the desiccated stumps by standard laparoscopic procedure.

Table III: Intraoperative Complications

Complications	No N = 130	Per- cent
Minor superficial burn to vulval skin due to bipolar forceps	5	3.86
Hemorrhage less than 100 ml	113	86.92
Hemorrhage 100 to 250 ml	15	11.53
Hemorrhage 500 to 700 ml, requiring blood transfusion	2	1.53
Torn uterine artery	1	0.76
Bladder injury by finger dissection	2	1.53

There was no major postoperative complication due to eletrosurgery; none had secondary haemorrhage (Table IV). Postoperative pain was mild in all cases. Mean hospital stay was 69.78 hours (range 36-96) or 2.9 days. 43.07% women left hospital in less than 48 hours (Table V). There was no readmission.

Table IV: Postoperative Complications

Complications	No N = 130	Per- cent
Minor superficial burn ulcer of vulval skin < 5mm size due to heat of bipolar current	5	3.86
Mild post-operative pain	130	100
Pelvic cellulites	00	00
Cystitis	7	5.38
Vault granulation	1	0.76

Table V: Duration of Hospital Stay

Duration in hour	No N = 130	Per- cent
36	14	10.76
48	42	32.30
72	19	14.61
96	55	42.29

Discussion

This study was started with the background knowledge of the use of electrocautery and scissors in performing total laparoscopic hysterectomy. We revised our technique with the learning curve and found that the strength of current used by us, the operative technique adopted by us and adequate exposure of target tissue and its desiccation close to the uterine wall did not cause serious electrical injury. Because the laparoscopic

bipolar forceps and ordinary bipolar forceps are thin and long instruments the difficulty of application of thick clamp and needle holder with needle in cases of poor access, relatively contraindicating vaginal hysterectomy⁵ by conventional method, is eliminated by our technique. Additional steps like use of right angled forceps to hook and stretch the uterine artery and other target tissues between its prongs and then desiccating them under direct vision and the use of telescope with light source as a thin rigid torch light to illuminate the deeper tissues better made the operation easier and safer increasing the proportion of hysterectomies performed vaginally. We refer to increasing the proportion of hysterectomies performed vaginally by Davies et al⁶.

Hurd et al⁷ reported that if distance between ureter and cervix is <0.5 cm then the chances of ureteral injury increases during hysterectomy by conventional technique. In our study extraperitoneal desiccation of vesicocervical - cardinal - uterosacral ligaments close to the cervix and uterine wall and their division reduced the chance of injury to neighboring organs like ureter because bipolar forceps requires less than 4-5mm space in contrast to the space required by clamp and suture. Bipolar coaptation seals arterial blood vessels immediately so that they can withstand the pulsatile arterial pressure until permanent sealing can be accomplished through healing process⁸. We found that ordinary bipolar forceps was preferable for achieving better compression of vessel walls and coaptation than the spring operated laparoscopic forceps.

Our approach to uterine artery was an easier and quicker one to access, identify, dissect and skeletonise the uterine artery. Its desiccation under direct vision between the prongs of right angle forceps further increased confidence and reduced the chance of injury to neighboring organs in our study. The bulge of the artery was the elbow portion of the uterine artery before branching and was booked by the bend of the right angle forceps. If the bulge was not seen then few fibres covering it could be dissected to expose the straight or tortuous bulge of the artery.

Bipolar electrocautery reduces the amount of blood loss significantly in abdominal hysterectomy as reported by Salvatove et al⁹. In our study intraoperative bleeding was less than 100 ml in 86.92% cases. In only two cases bleeding was about 700 ml requiring blood transfusion. In one of those two cases the undesiccated uterine artery was divided by chance. In the other case of fibroid with early pregnancy the cautery was not working satisfactorily. There was our no retraction of bleeding uterine artery and no postoperative hemorrhage from uterine arteries. Our approach to uterine artery successfully isolated uterine arteries except in one cases.

Less intraoperative bleeding is due to easy and quick approach to uterine arteries by our technique and their desiccation. Post-hysterectomy laparoscopy showed well-desiccated stumps without organ injury confirming the intraoperative safety of our technique.

Injury to bladder wall occurred in two cases during finger dissection of bladder wall from cervix and anterior uterine wall (Table II). They were not due to electrical injury. The operating time varies with size of uterus and additional procedures. Our operating time is comparable to that of Magos et al⁴ who reported mean operating time of 84.3 minutes with a range of 30 to 150 minutes.

Transection of the desiccated ovarian ligament and tube had to be done slowly as these stumps very quickly move away from the field. Tracing of such retracting stumps can be done by climbing up with posterior peritoneal fold of broad ligament by two forceps under good illumination.

The amount of tissue involved in coagulation was less than the amount of necrotic tissue caused by clamps and suture. Bipolar coagulation destroys the nerve endings and sterilizes the stumps thus resulting in less inflammatory reaction and less postoperative pain and shorter hospital stay². Mean hospital stay of 69.78 hours (2.9 days) in our study was less than 3.7 days reported by Magos et al⁴. Hospital stay of 96 hours in majority of cases was due to social causes as they were fit to go home after 48 hours.

Technically and physically the stumps secured in vaginal hysterectomy using electro cautery looked similar to the stumps secured in total laparoscopic hysterectomy using electro cautery as revealed by post-hysterectomy laparoscopy in our study.

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