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Purohit technique of vaginal hysterectomy: a new approach

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To ease intra-operative access to laterally at vaginal hysterectomy, we have developed the 'Purohit technique of vaginal hysterectomy' using a right angle forceps, electrocautery and 10 mm telescope with light source. A prospective study on consecutive 214 women with benign disease of the uterus without prolapse, including cases with relative contraindications (excluding endometriosis and uteri above 20 weeks size), demonstrated it to be easy, safe and effective. Vaginal hysterectomy was successfully completed in 213 (99.53%) cases, with one failure (0.46%) which needed laparoscopic assistance. Vaginal salpingo-oophorectomy was completed in all indicated cases. We believe that many abdominal and laparoscopic hysterectomies could be avoided by this technique. Details of the technique can be seen on the following website http://www.purohittechnique.com

INTRODUCTION

Many patients undergoing total abdominal hysterectomy and laparoscopically assisted vaginal hysterectomy could probably undergo total vaginal hysterectomy instead[1]. Despite the advantages of lower morbidity and faster recovery[2], only 25–40%[3] of hysterectomies are performed by the vaginal route although there is a feasibility rate of 79%[4]. Vaginal hysterectomy can be more complex and gynecologists need to be familiar with surgical techniques[5]. Many surgeons might not feel comfortable with the vaginal route particularly where relative contraindications[6] exist (e.g. large uterus, nulliparity, inadequate access, previous cesarean delivery pelvic laparotomy and if oophorectomy is required).

If the hysterectomy could be performed through the vaginal route by an easier method allowing access to the parauterine space with minimal use of large clamps and morcellation and with better vision of deeper structures, then the proportion of hysterectomies performed vaginally might be increased.

We have developed a technique ('the Purohit technique of vaginal hysterectomy') described below, using right angle forceps, electrocautery and a thin long rigid 10 mm telescope with light source, and we studied its feasibility, efficacy and safety.

METHODS

A prospective observational study was carried out between August 1999 and April 2002 on 214 women without prolapse who requested hysterectomy for different benign diseases of the uterus. They were selected irrespective of parity, obesity, parametrial scarring, configuration of uterus, history of previous abdominal and vaginal operations, need of removal of ovarian cysts (up to 5–7cm) or oophorectomy. Exclusion criteria were uterine size above '20 weeks', known endometriosis and malignancy. All cases were performed by the author.

Assuming that all cases would be feasible, vaginal hysterectomy was tried initially in all included cases by the author. The success, failure and safety were measured from intra- and post-operative complications, duration of operation, need of laparoscopic assistance, post-operative pain and duration of hospital stay, readmission.

Only 3 drops of injection adrenaline of 1 in 1000 strength was mixed in 30 mL normal saline and was infiltrated around cervix.

The principles of the Purohit technique of vaginal hysterectomy were:

1. Vaginal walls are incised by monopolar current (30–35 W).
2. A right angle forceps is used throughout to elevate, hook, stretch, spread and retract all the lateral attachments of uterus and vessels from their posterior aspects; tissues are desiccated/coagulated by bipolar current (45 W)[7] and divided between the prongs of forceps. Uterine arteries were secured extraperitoneally.
3. A 10 mm telescope with light source is used to illuminate any step of the operation where poor visibility is an obstacle to proceed further.
4. Conventional volume reduction manoeuvres[6,8,9] are used as associated procedures in cases of large uteri to create the parauterine space for bipolar forceps and scissors.

Vaginal hysterectomy was commenced in the standard manner[10,11]. Infiltration with adrenaline (1 in 1000 strength) mixed in 30 mL normal saline was infiltrated around the cervix.

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A straight bipolar forceps (BF) 9 in. long and tip surface area of 1 cm was used. Figure 1 shows the tip of the forceps inserted into the tissues of the lateral vaginal wall (LVW) incision directing towards the cervix (CX). The tissues were coagulated close to the cervix in smaller bites and incised to make a split between the vesicocervical–cardinal–uterosacral ligaments (VSUS) and the cervix (Fig. 1b). The procedure was started from the vesicocervical ligament, carried out backwards and upwards to detach the ligaments from the cervix. The tip of a right angle forceps (RAF) was applied between the posterior wall of cervix and ligament (Fig. 1); the forceps was gently pressed (open arrow) on the speculum to cause a lever action to elevate the ligaments from their posterior aspects and bring them easily into view. This manoeuvre is helpful in gaining access to paracervical tissues in cases with poor access.

Figure 2 shows the detached end (DE) of the ligaments pushed by index finger (IF) along the lateral wall of uterus in the direction of ascending branch of uterine artery (ABUA) to expose the bulge of the tubular uterine artery (BUA).

Figure 2a–d illustrates steps of an easier technique to expose and secure the uterine artery (UA) extraperitoneally. The tip of right angle forceps was brought in contact with the posterior aspect of the artery (Fig. 2a), then the tip was inserted (arrow) between the bulge and uterine wall to hook the artery (Fig. 2b); the mouth of the forceps was opened to stretch and spread that portion of the artery between the prongs (Fig. 2c), and an ordinary bipolar forceps or a standard laparoscopic bipolar forceps was inserted between the prongs of the right angle forceps to cauterise the artery (Fig. 2d) and then divide it by scissors between the prongs of the right angle forceps. Clamps were not used, ordinary bipolar forceps was preferable for achieving better coaptation[7,12] by exerting manual pressure rather than the spring operated laparoscopic bipolar forceps. Two to three strokes of coagulation along the length of arterial wall were required for achieving haemostasis. Any bleeding from the end of the artery was cauterised to achieve haemostasis.

The divided end of the uterine artery was digitally pushed upwards and outwards. The procedure was then repeated on the other side to secure the uterine artery extraperitoneally.

The posterior cul-de-sac peritoneum was incised to proceed intraperitoneally. Figure 3 shows the tip of right angle forceps inserted in to the cul-de-sac. The posterior peritoneal fold and remaining few fibres of the cardinal ligament (PFCL) were hooked from the posterior aspect, stretched and cauterised close to the uterine wall and divided between the prongs of the forceps. The divided end was pushed up along the lateral wall of uterus. The same procedure was repeated on the other side. This manoeuvre enhances the descent of the cervix that brings down the anterior cul-de-sac to the surgeon's view. Adhesions if any in the Pouch of Douglas (POD) were also divided close to uterus.

The anterior cul-de-sac was then incised.

The anterior and posterior peritoneal folds, round ligament, ovarian ligament and tube on either side were similarly detached and the uterus was removed. No clamps, ligation or stay sutures were used up to this stage.

The technique of 'hooking' with right angle forceps from the posterior aspect, stretching and spreading between its prongs, coagulation and division close to the uterine wall was applied to the round ligaments, ovarian ligaments and tubes including the infundibulo-pelvic ligaments. This was similar to the one used for the uterine artery.

Adequate retraction of the incised vaginal margins by retractors (R) exposes the tip of cauterised Mackenrodts ligament, which was pulled by Allis forceps and anchored to the vaginal vault by Vicryl no. 1 sutures. The vault was closed leaving a corrugated drain *in situ* for 12 hours.

Cases with no cervical descent with traction under anaesthesia, even after detaching the vaginal walls, were labelled as 'difficult cases with poor access', 22(10.28%).

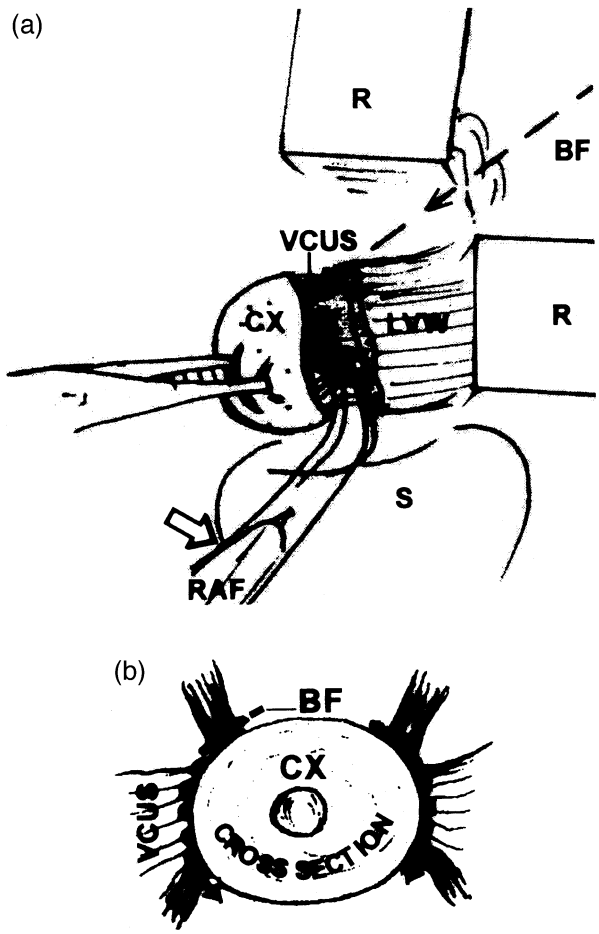

Fig. 1. (a) Technique of desiccation and division of vesicocervical–cardinal–uterosacral ligaments. (b) Cross section showing the desiccation started from the vesicocervical ligament and proceeded backwards, upwards and close to the cervix.

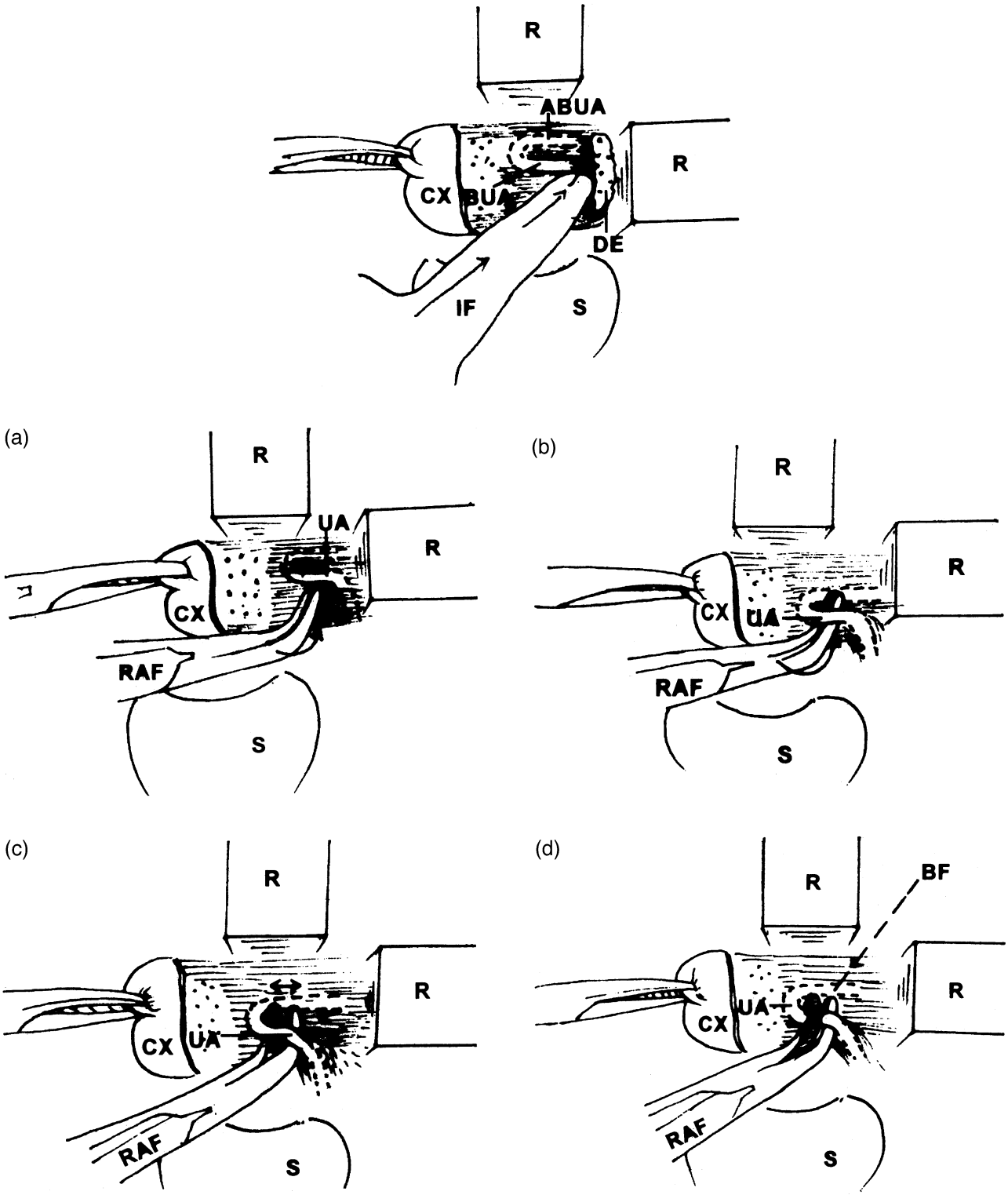

Fig. 2. Technique to expose the bulge of the tubular uterine artery. (a) Tip of the right angle forceps was brought in contact with the posterior aspect of the bulge of the uterine artery. (b) Tip of the right angle forceps was inserted between the bulge and uterine wall to hook the artery. (c) The mouth of the right angle forceps was opened to stretch and spread that portion of the artery between the prongs of forceps. (d) The bipolar forceps was inserted between the prongs of the right angle forceps, the artery was desiccated.

In those cases, the POD was opened initially after dissecting the posterior peritoneum to proceed intraperitoneally. Release of the Mackenrodts ligament with posterior peritoneum was done on either side as described above to enhance the descent of the cervix and uterus. In cases where the POD could not be opened, extraperitoneal dissection using the

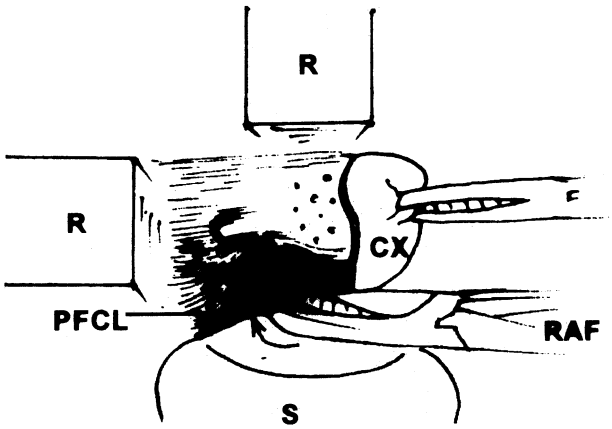

Fig. 3. The posterior peritoneal fold with fibers of the cardinal ligament hooked by right angle forceps from the posterior aspect, desiccated close to the uterine wall and divided.

right angle forceps was continued to reach the peritoneal cavity.

We failed to complete vaginal hysterectomy in one case (after securing the uterine arteries we failed to climb up because of severe adhesion in posterior cul-de-sac with uterus of 14 weeks size) that needed laparoscopic assistance to release upper pedicles, adhesions and uterus was removed vaginally.

One case had vesico-vaginal fistula who had a history of hysteroplasty with longitudinal vaginal septum resection with severe adhesion in posterior cul-de-sac.

Two cases required blood transfusion one of whom had intraoperative bleeding of 1500 mL for we had to use bisection and wedge morcellation to remove a big central cervical fibroid of 9.4 cm before the uterine arteries were secured.

After separation of the cornual components from the uterus, the ovarian stump was held by the Allis forceps. Wet ribbon gauze packing was done to retract bowel.

Figure 4a illustrates one Allis forceps (AF) holding the round ligament stump (RL), the other Allis forceps holding the tube (T) with ovarian ligament pedicles (OL). The portion between two forceps was cauterised and incised to make a split to separate the tube with the ovarian ligament from the round ligament and the upper part of broad ligament.

Traction was applied on the ovarian ligament in a downward and outward fashion. The tip of right angle forceps was used to palpate the extent of the mesosalpinx, the upper pole of ovary (O) and the upper border of the infundibulo-pelvic ligament. Through the split, the cautery and division procedure was carried out in smaller bites upwards between the prongs of the right angle forceps. After reaching the upper pole of the ovary, the infundibulo-pelvic ligament (IPL) was hooked by the bend of the right angle forceps (Fig. 4b), cauterised and divided between the prongs of forceps taking smaller bites step by step to avert losing the pedicle following the same technique as for the uterine artery. This manoeuvre improves access and visibility. In cases with poor visibility (e.g. due to obesity, short infundibulo-pelvic ligament, cyst or adhesions), a telescope (TL) with light source (LS) (Fig. 4b) was used.

RESULTS

Vaginal hysterectomy was completed in 213 (99.53%) consecutive cases and failed in one (0.46%) case that needed laparoscopic assistance to release the upper pedicles. Morcellation was required in 13.55% of cases. Mean uterine weight was 191.91 (101.52) g [40–950]. Vaginal salpingo-oophorectomy was completed in all 24 indicated

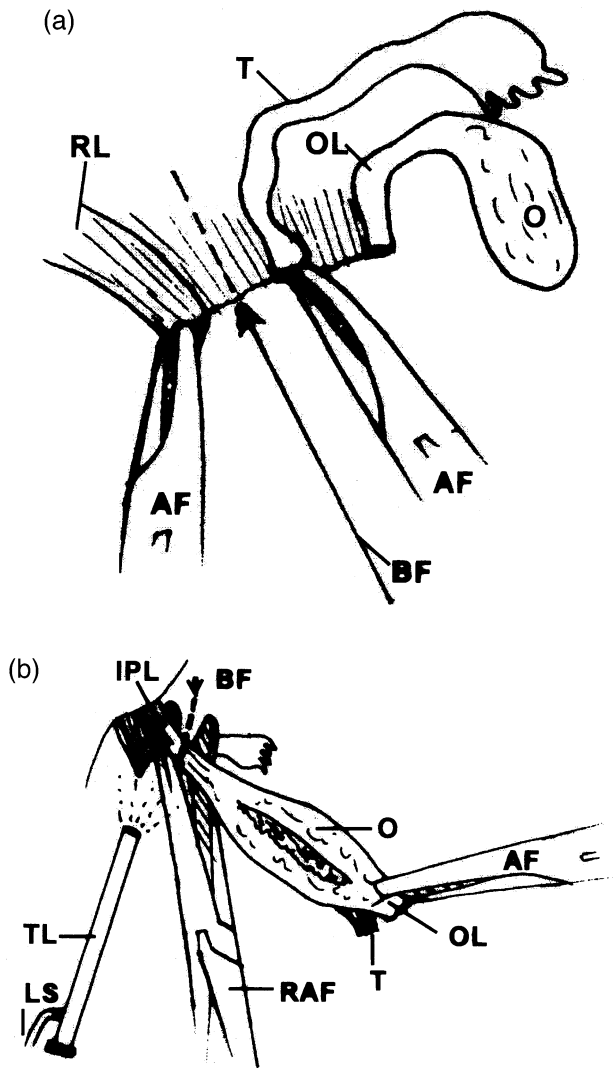

Fig. 4. (a) The tissue between the round ligament and the tube was stretched by Allis forceps and desiccated and incised to split. (b) Infundibulo-pelvic ligament, hooked by right angle forceps, coagulated and divided between its prongs. 10 mm telescope with light sources used for illumination.

cases including two of twisted ovarian cyst. Mean operating time for unilateral salpingo-oophorectomy 14.09 [6–55] minutes. Laparoscopy immediately after closure of the vault was performed to the pedicles in 34 (15.88%) randomly selected cases. This showed well-cauterised pedicles in all cases.

Intra-operative bleeding was less than 100 mL in 87.85% of cases, 0.93% required blood transfusion. Cystostomy was performed 0.93%, with no rectal injury. Mean haemoglobin loss was 0.5g/dL [0.2–4.0]. There was no major electrical injury. Mean operation time 60.6 (26.53) minutes [25–180]. There was mild post-operative pain in 98.59% of the cases. No post-operative haemorrhage occurred from the uterine artery. Mean hospital stay was 2.7 (1) days [1–10]. One (0.46%) had vesicovaginal fistula who had history of hysteroplasty with longitudinal vaginal septum resection. Vault haematoma of 20–100 mL size was present in 2.33% in the second week after operation. Two (0.93%) required readmission for drainage.

CONCLUSIONS

We believe that our technique of vaginal hysterectomy is feasible, safe and effective in conducting vaginal hysterectomy and salpingo-oophorectomy in almost all cases of benign disease with a uterus up to 20 weeks of gestation size and without prolapse irrespective of most pre-existing conditions regarded as relative contraindications to vaginal hysterectomy. Accessibility[13] to narrow working spaces between the uterus and the pelvic side wall can be difficult due to clamps and this was made easier by the use of thin, long instruments such as bipolar forceps. Extraperitoneal approach by electrosurgery[14], cautery and division under direct vision between the prongs of forceps reduces the risk to neighbouring structures. The approach to the uterine artery is quick and safe. The divided proximal end comes into the surgeon's view rather than retracts. We believe that many more abdominal and laparoscopic hysterectomies could be avoided by this modification of vaginal hysterectomy.

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