European Journal of Medical and Health Sciences
Vol 5 | Issue 4 | August 2023
ISSN 2593-8339

RESEARCH ARTICLE

Vaginal Transection Versus Vaginal Entry Cuff Closure Technique Following Elective Abdominal Hysterectomy for Benign Lesions-A Prospective Comparative Study

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ABSTRACT

Background: **Total abdominal hysterectomy is most common performed gynaecological operation. There is no standard recommendation or guidelines regarding management of vaginal cuff. This study aimed to determine the advantages and disadvantages of vaginal transection versus vaginal entry technique following elective abdominal hysterectomies for benign lesions.**

Methodology: **This is a comparative study involving 180 women undergoing elective hysterectomy in Sparsh hospital, from 10 Jan 2015 to 10 Jan 2020. Patient was randomized to either transactional vaginal or vagina entry technique of cuff closure. In this we compare Operating time, length of hospital stays, estimated blood loss, post operative discharge. Vaginal length, vaginal cuff infection and granulation after 6 weeks follow up time. A prospective study on all hysterectomies performed by the single senior surgeon at Sparsh hospital in order to eliminate possible differences in surgical techniques and abilities.**

Result: **We found in this study that operating time, blood loss, post operative discharge from vault is less in transection technique of vaginal cuff closure in comparison to vaginal entry technique. Febrile complain is more in vaginal entry cuff group patients. Hospital stay is long in vaginal entry technique patients. There is no difference in post operative vaginal length in both the techniques. Transection technique is easy to perform.**

Conclusion: **Transection cuff closure technique is better than vaginal entry technique.**

Keywords: Abdominal Hysterectomy, transection cuff closure, vaginal entry cuff closure.

Submitted: July 01, 2023

Published: August 22, 2023

10.24018/ejmed.2023.5.4.1870

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I. Introduction

Abdominal hysterectomy is the most common operation performed by gynaecologist. Commonly used techniques are, intra facial, extra facial and supracervical hysterectomy. There is an increasing number of approaches to the surgical removal of the uterus, each has clinical advantages and disadvantages. However, hysterectomy is an operation around which there has been considerable controversy [1], [2]. There is no standard recommendation and guide lines regarding the closure of the vaginal vault [3]. Two surgical techniques have been described for vault closure during abdominal hysterectomy. Starting in 1926, there was a description in the literature about the closure of the vaginal vault from abdominal approach, which essentially is a front to back closure [4]. Assessment of outcome needs to consider both immediate, medium term and later effects. Early effects are haemorrhage, trauma to ureters, and pain, medium term effect include bowel, urinary or sexual dysfunction, later effects are above all, genital prolapse.

Classical method of total abdominal hysterectomy as described by Richardson allows retroperitoneal drainage to occur through an open vaginal cuff. There have been many changes and modifications in the procedure over the years. However today most of the surgeons performing

abdominal hysterectomy use the vaginal entry cuff closure technique.

In our study we have used the transection technique of vaginal cuff closure, this technique keeps the vagina closed at all the times, avoids blood loss and spillage of vaginal contents into the peritoneal cavity [4].

II. Material Method

A prospective comparative study on all the abdominal hysterectomies performed by senior surgeon at Sparsh hospital over a period of 5 years, from 10 Jan 2015 to 10 Jan 2020.

This study included the patients who underwent total abdominal hysterectomy with or without unilateral or bilateral salpingo-ooperectomy. Patient was selected with the common criteria of benign gynaecological disorders for total abdominal hysterectomy. Any additional incidental process such as lysis of adhesions were not excluded from the study because of their equal distribution among the both the groups.

The patients with suspicion of the malignant process, gestational trophoblastic disease, peripartum hysterectomy, and total abdominal hysterectomy for other surgical procedures were excluded. Technique of operation was same in all operations except vault closure was different.

A series of 180 consecutive total abdominal hysterectomies has been studied, data presented in this study aims to compare the two methods of vaginal cuff closure. The vaginal cuff was closed in 120 patients by vaginal transection technique (group A), and by vaginal entry cuff closure technique in another 60 patients (group B).

Vaginal toilet with betadine was done to every patient and vaginal tablet was kept one day prior to hysterectomy in all patients. Same prophylactic antibiotic was used for all patients.

Inj ampicillin, infusion Metrogyle 100 ml and gentamicin 80 mg at least 8 hrs before the procedure.

III. Technique of Vaginal Transection

For this surgeon's hand palpates through the ant and post vaginal walls to identify the most inferior level of the cervix. Here a sharply curved large Zeppelin clamp is placed across the anterior and posterior vaginal walls just below the cervix on one side. This is repeated on the other side, tips of the both clamps meet in the mid line. These clamps include the base of the cardinal ligament laterally, the uterosacral ligament posteriorly and vaginal wall anteriorly and posteriorly. Bladder must be sufficiently mobilized away from this point to prevent injury.

Vaginal tissue above the level of this clamps is transacted. This procedure frees the uterus from the pelvis. Care is taken not to not to contaminate the surgical field by touching the vagina or vaginal portion of cervix or dribbling vaginal fluid in the pelvis. Transfixing sutures are placed below the Zeppelin clamps and the clamps are removed. Inclusion of uterosacral and cardinal ligament in this pedicle provide excellent support of the vaginal apex.

With this closed cuff technique vagina is never exposed to peritoneal cavity, which reduces contamination of peritoneal cavity.

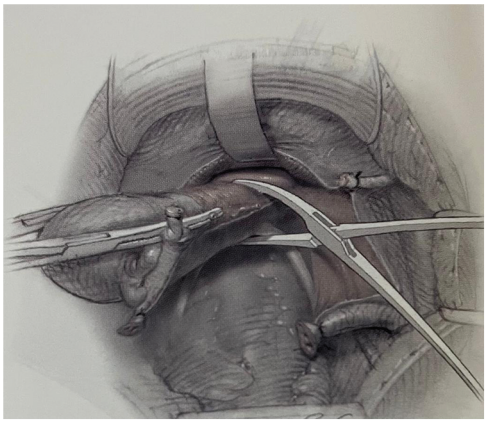

Fig. 1. Application of clamps transection of vagina above clamps, and suturing of cuff.

IV. Vaginal Entry

After cardinal ligament cut and ligated, an incision is made on in the mid line of the upper anterior vaginal wall. Sometime vaginal entry is made from the lateral side. A finger is inserted to palpate the cervical margins. Once this level is known, one blade of Jorgenson scissors is inserted into the vagina and positioned just below the cervix. At this level, the vagina is then circumferentially cut. Kocher or Allies clamps are placed along the free cut vaginal edge as it forms.

A. Vaginal Cuff Closure

A no 1 delayed absorbable suture may be placed to suspend the vaginal apex to the uterosacral ligament pedicle on either side, this stitch incorporates the anterior and posterior vaginal walls with the distal portions of the uterosacral ligament and helps prevent vaginal cuff prolapse following surgery.

These sutures are kept long and held by haemostats. Upward and lateral traction elevate the vaginal cuff. The full thickness of the incised anterior and posterior vaginal walls are then reapproximated with the running suture line or with interlocking sutures or with several figure of

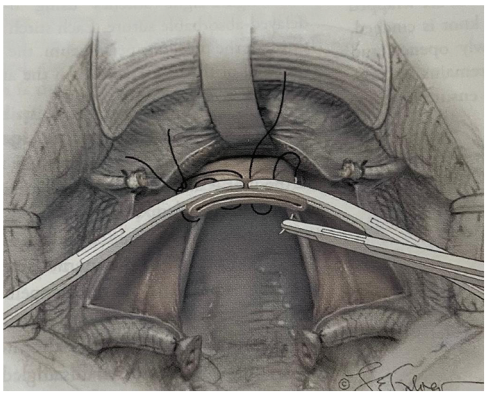

Fig. 2. Vaginal cuff closed with a Heaney suture ligature incorporating the uterosacral ligaments in the closure.

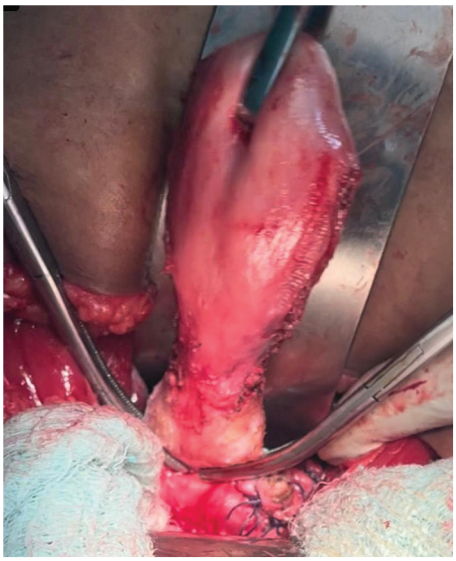

Fig. 3. Application of clamps just below the cervix.

eight sutures. Importantly, omitting portions of vaginal epithelium in the closure can lead to significant post operative bleeding. Peritoneum adjacent to the vaginal cuff should be included in this closure to lessen the risk of post operative bleeding or oozing. Anteriorly the bladder should be kept clear of the suture line. Once the vaginal cuff is haemostatic the lateral suspending cuff sutures are cut.

V. Results

A series of 180 consecutive total abdominal hysterectomies has been studied. There is no difference in group A and group B in terms of age, type of patient built and parity. Average age of patients in group A, in group B is 47.3 years. Indication for surgery is benign lesions. The two group were similar thus were suitable for comparisons. No patient in any group had any medical disorders.

Fig. 4. Multiple instruments present at cuff closure step in vaginal entry cuff closure technique.

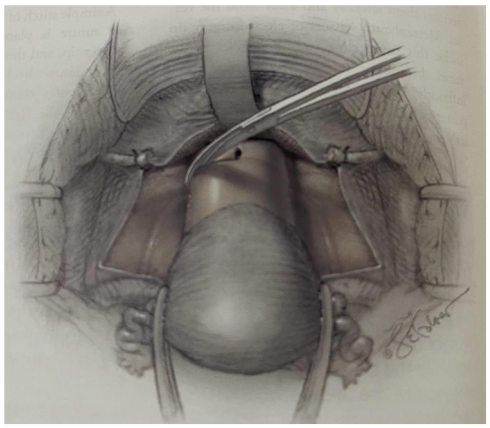

Fig. 5. This picture showing opening of vagina from front.

There was 1.5 times more expanses in group B patients due to more post operative morbidities and prolonged hospital stay. The surgical time in vaginal transection cuff closure technique is markedly less. Estimated blood loss is also very less in transactional technique. Average length of hospital stay is also less in group A patients. Bladder injury occur in I patient in group B, manged intra operatively.

Temperature 100 degree or greater on 2 separate reading after first 24 hours post operatively.

Fluid collection in POD is more in vaginal entry groups in USG examination. This may be the cause of discharge per vaginum and source of infection.

On 6 weeks follow up 26 patient in vaginal transection group and 7 patients in vaginal entry group did not follow up, there is a marked difference in in blood stained discharge and white discharge in group A and in group Fever present in 15 patients of group B.

At 6 weeks follow up 8.3% of group A and 33% of group B complain of pain.

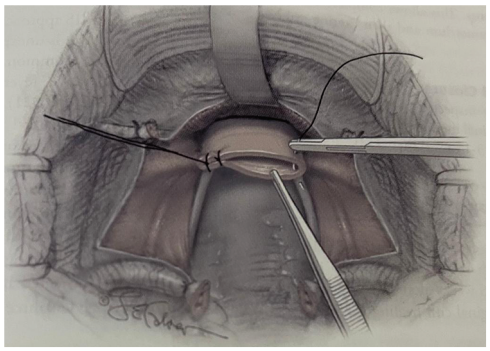

Fig. 6. Suturing of vagina in vaginal entry cuff closure technique.

TABLE I: Comparison of Vaginal Transection Cuff Closure and Vaginal Entry Cuff Closure in Terms of Length of Hospital Stay, Operating Time of Vault Closure, Estimated Blood Loss at Vault Closure Step and Injury to Adjacent Organs

	Transection vaginal cuff closure (group A)	Vaginal entry cuff closure (group B)
Operating time (VC)	3 minutes	12 minutes
Bladder injury	0	1
Estimated blood loss	1 ml to 1.5 ml	15 ml
Hospital stay	4 days	7 days

TABLE II: Comparison of Vaginal Transection and Vaginal Entry Cuff Closure Techniques in Terms of Post Operative Morbidities in One Week

Complication	Vaginal transection	%	Vaginal entry cuff closure	%
Post operative fever	4	3.3%	18	30%
Urinary infection	3	2.5%	3	5%
Wound infection	5	4.1%	3	5%
Reactionary haemorrhage	0		0	0
Pelvic hematoma	0		3	3%
Vaginal dome bleeding	0		0	0
Vaginal discharge colour less	3	2.5%	12	20%
Vaginal discharge blood stained	3	2.5%	18	30%
Dehiscence	0		0	

TABLE III: Post Operative Comparison after 6 Weeks

	Vaginal transection group	%	Vaginal entry cuff closure	%
Pelvic pain	10	8.3%	20	33%
Granulation tissue at vault	0		0	
Blood-stained discharge	3	2.5%	15	25%
White discharge	3	2.5%	18	30%
Hematoma	0		0	
Fever	2	1.6%	8	13%
Vaginal length average	8.5 cm		8.3 cm	

2.5% of group A and 25% of group B complain of blood stained discharge. No incidence of granuloma formation in both the groups.

The surgeon's clinical judgement in term of comfortability, easiness and adaptability were assessed that surgeon is more comfortable in doing vaginal transection cuff closure technique.

VI. Discussion

Hysterectomy is well-known as one of the most frequently performed of all major surgical operation and is of great economic, medical and social importance [5]. In the India there are no available researches that they compare these 2 surgical techniques. At present there is no standard recommendations or guide lines regarding management of vaginal cuff following hysterectomy. There are several approaches to closing the vaginal vault in abdominal hysterectomy, each using different technique and sutures. Different techniques are used to minimise the development of vault hematoma and granulation tissues [8].

We are comparing the 2 techniques of closed vaginal cuff. Closed vaginal cuff method is believed to eliminate peritoneal contamination by vaginal flora decreasing the incidence of vaginal vault infection and peritoneal or ascending infection hence decreasing duration of hospital stay [6]. In a study done by Miskry *et al*., mass closure of the vaginal vault ensures haemostasis, decrease vault hematoma and vaginal cuff infections. In terms of length of hospital stay, a randomised controlled trial involving patients undergoing elective total abdominal hysterectomy for benign disease reported an average length of hospital stay of about 4 days [4]. In their study the, the two groups were similar in age and to variables related to the surgical procedure and thus consider suitable for comparison [4]. Average length of stay in vaginal transection cuff closure is 4 days, in vaginal entry group is only 7 days.

In vaginal transection cuff closure, vagina is not open at all, and there is no exposure of peritoneal cavity to vaginal flora and edges of vagina is also stitched. Edges of vagina is not left unsupported, so there is no chance to bleed. In last clamp, includes base of the cardinal ligament laterally, uterosacral posteriorly and vagina wall anteriorly and posteriorly. In this way we not cut uterosacral and base of the cardinal ligament, this provides very good support to vaginal vault. There was always a good traction to vaginal vault, this provides less risk to bladder and less time taken to close the vault.

In vaginal entry cuff closure, cardinal and uterosacral ligaments cut and ligated, uterus is removed and edges of vagina was held with long allies, edges keep on bleeding until they vaginal cuff was closed. Peritoneal cavity is exposed to vaginal flora. There was very little distance between peritoneal cavity and vaginal canal. There was no traction from above, we cannot give much traction to vaginal wall, so stitching of vault take more time, there was more risk to bladder injury, due to close a proximity of bladder to cut edge of vagina. We had to give more attention to bladder.

In vaginal entry cuff closure, there is more blood collection in POD, due to more bleeding, as compared to vaginal transection method. That's why there is more chances of infection in post operative period. In other study pelvic fluid collection was higher after the closed vaginal vault hysterectomy [7]. This may be the cause of fever and increased discharge in post operative period as compared to vaginal transactional cuff closure technique.

In one week follow up, more patients are complaining for blood-stained discharge, white discharge and fever in vaginal entry cuff closure as compared to vaginal transection group. In vaginal entry cuff closure group, 30% patients complaint of blood stained discharge and 20% complaint of colour less vaginal discharge, in comparison to this only 2.5% patient in vaginal transection cuff closure group having complain of colourless discharge per vaginum.

25% patients complaint of blood-stained discharge and 30% patients complaint of white discharge per vaginum, in vaginal entry cuff closure group at 6 weeks follow up.in comparison to this only 2.5% patients complaint of blood-stained discharge and 2.5% patients complaint of white discharge per vaginum, in vaginal transection cuff closure group.

Vault hematoma is a common finding in the first week following hysterectomy and has no significant correlation with surgical technique or surgical blood loss, although large hematomas are associated with febrile morbidity, most hematomas are small and self-resolving [9]. In our study 3 patients of vaginal entry group develop vault hematoma and resolve with time. No surgical intervention was done.

In our study there is marked difference in vaginal bleeding at vault closure step and time taken at this step. In

vaginal transection cuff closure average blood loss was 1 ml to 1.5 ml and average time taken is 3 min. In vaginal entry cuff closure average blood loss is 15 ml and average time taken is 12 minutes.

Surgeons' comfortability, easiness and adaptability is more in vaginal transection cuff closure method.

In our institute most surgeon prefer vaginal entry cuff closure technique. Comments regarding vaginal transection cuff closure technique include "very easy to do" and require "short time to close the vaginal vault".

VII. Conclusion

In this study vaginal transection technique showed advances over vaginal entry techniques in terms of post operative morbidities, operative time and blood loss. In this study length of hospital stay is also less in vaginal transection group. In terms of pain and healing both techniques showed no difference. Vaginal transection technique showed benefit in favour of easiness, adaptability and comfortability. A surgeons' competence careful and meticulous surgical techniques and antibiotic prophylaxis seem to remain the most important factors to prevent post operative complications such as infection and pelvic hematoma. Both technique of vaginal vault closure is acceptable. However, there is no published researches to negate or favour these findings. Further studies are needed to validate these findings.

VIII. Limitation and Recommendations

This is a single centre study. Easiness adaptability and comfortability is studied with only one surgeon. In cases with elongated cervix and other pathology at cervical end, vaginal transection vaginal cuff closure is difficult to perform in these cases this technique would remove too much of vagina. In such type of cases vaginal entry cuff closure technique is useful. To validate outcome of this study multicentre study with different surgeons is required.

Funding

None.

Conflict of Interest

The author declares no conflict of interest.

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