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Case Series

Laparoscopic vaginal vault lateral suspension: a promising alternative to laparoscopic sacrocolpopexy for post-hysterectomy vault prolapse management

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ABSTRACT

Post-hysterectomy vaginal vault prolapse is a common complication. There is an impact on the quality of life of patients after undergoing different types of hysterectomies, due to associated urinary, anorectal and sexual dysfunction. A clear understanding of the supporting mechanisms for the uterus and vagina is important to minimize the risk of post hysterectomy occurrence of vault prolapse, and also to make the right choice of the corrective procedure for vaginal vault prolapse. The gold standard for surgical management of post-hysterectomy vaginal vault prolapse has been sacrocolpopexy. However, with the procedure there is risk of accidental trauma to the pre-sacral venous plexus. In this article we present our technique of laparoscopic vaginal vault lateral suspension (LVVLS) with fixation to anterior superior iliac spine (ASIS). This technique offers the same benefit as sacrocolpopexy but without the risk of haemorrhage from the pre-sacral venous plexus, potential nerve injury, ureteral injury, bladder injury and rectal injury.

Keywords: Post hysterectomy vaginal vault prolapse, Sacrocolpopexy, Laparoscopic lateral suspension

INTRODUCTION

There is no precise definition of post-hysterectomy vaginal vault prolapse (PHVP); however, the International Urogynecological Association (IUGA)/ International Continence Society (ICS) joint report on female pelvic floor dysfunction defines it as 'descent of the apex of the vagina (vaginal vault or cuff scar after hysterectomy)'.¹ Also 2nd and 3rd degree uterine prolapse depending on symptom severity is also an indication for the surgery. Here the uterus can be preserved.

The incidence of post hysterectomy vaginal vault prolapses ranges from 0.2 to 43%.^{2,3} according to older

case series. However, more recently the incidence has been quoted at 11.6% if hysterectomy was done for prolapse and 0.2% for non-prolapse benign cases.⁴

Its management depends on the severity and symptomatology. While grade I or II can be managed by non-surgical techniques, symptomatic grade II to grade IV almost always need surgical intervention. The gold standard for surgical management has been sacrocolpopexy, either abdominal (ASC) or laparoscopic (LSC) which has shown consistent outcomes and extremely low rates of recurrence. With recent advances, almost every sacrocolpopexy done today is laparoscopic.

However, one common complication seen with LSC, more often than ASC, is accidental trauma to the pre-sacral venous plexus, which has an incidence between 1 to 7 % across various studies. This complication requires conversion to open surgery and can be life threatening if not managed on time. Hence, the need for alternate techniques which have similar efficacy without the risk of life-threatening haemorrhage and additional complications which have been reported including potential nerve injury, ureteral injury, bladder injury and rectal injury.

Here, we introduce our technique of laparoscopic vaginal vault lateral suspension (LVVLS) with fixation to anterior superior iliac spine (ASIS) which potentially offers the same benefit as LSC or ASC but without the risk of haemorrhage.

Application of LVVLS procedure (a) uterine prolapse; and (b) vault prolapse.

Prolapse can be caused due to: (a) failure of support system, e.g. the pelvic floor weakness, peri-visceral tissue damage; and (b) failure of Suspensory system, e.g. Ligament to bony attachment.

Repair of support system is complex.

Currently most repairs are focussed on suspensory system are (a) sacrohysteropexy- for uterine prolapse; (b) sacrocolpopexy, and Pectopexy - for vault prolapse.

Logic of current proposed procedure (a) mesh low volume easily available (TVT Sling). 'Hammock fixation' fixed at 2 bony points of Anterior superior iliac spine (ASIS) on both sides; (b) mesh can be reinforced with No. 0-1 prolene suture interlaced along the length of the mesh; (c) area of mesh (1×1 cm), anchored to cervix in uterine prolapse where uterus is preserved or anchored to the vault in case of vault prolapse; (d) no contact with rectum, bladder, ureter unlike other methods. Mesh is extra-peritoneal like the round ligament; and (e) symmetrical tensioning possible and open fixation over (ASIS) ensures firm fixation; (f) procedure of hitching up of middle pelvic compartment helps in reducing anterior compartment laxity (Cystocele) and posterior compartment laxity (rectocele).

CASE SERIES

This is a case series of 12 patients who had previously undergone laparoscopic hysterectomy for benign/malignant indications and later developed symptomatic vault prolapse. They were initially managed conservatively but due to continuing symptoms were considered for surgical treatment. Patients included in the study were ladies with a performance score of 0 or 1, irrespective of age, without significant comorbidities. Patients with poor performance status, poor cardiac reserve and other co-morbidities precluding safe laparoscopy were excluded.

Surgical technique

The procedure is done under general anaesthesia in supine position. Catheterisation is essential. Pneumoperitoneum is created either through the open technique or by the use of Veress needle in the supra-umbilical region. This is used as a 10 mm camera port (A1) which is also used to deliver a tension-free vaginal tape (TVT) for vault suspension. Two lateral 5 mm ports (B1, B2) are placed in the spino-umbilical line, four finger-breadths away on either side. Two additional 10 mm incisions are made just anterior to Anterior Superior Iliac Spine (C1, C2) which serve as ports to pull TVT ends and for anchoring sutures over Anterior Superior Iliac Spine (ASIS). The port position is shown in Figure 1.

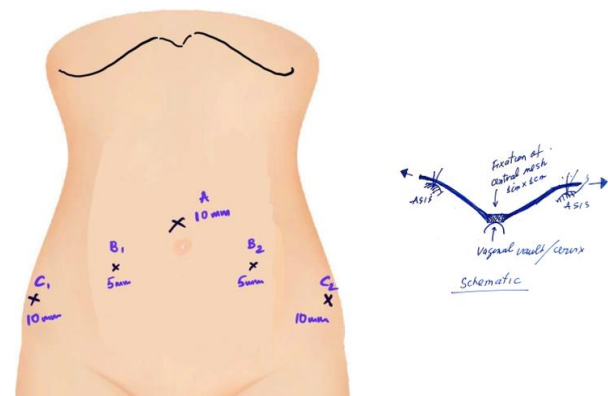


Figure 1: Laparoscopic port positions.

In Trendelenburg position, the bowel loops are swept cranially. A vaginal manipulator is used to push the vault cranially. The vault is then grasped; peritoneum incised and reflected off it and the bladder is pushed anteriorly, away from the vault. Adhesions, if any, are released and the vaginal vault is completely defined. A TVT is then passed intra-abdominally through A1 and unrolled. The central polypropylene mesh is then sutured to the vaginal vault using interrupted polypropylene 2-0 sutures.

Through C1, a fine tip 8-inch-long curved dissecting forceps passed from ASIS, along the round ligament in the pre-peritoneal plane. The course of this forceps is monitored laparoscopically as it exits alongside the vault. The ipsilateral tip tubing of the TVT is grasped and pulled through the same pre-peritoneal tunnel and delivered out through C1. Here, the TVT tip essentially acts as a prosthetic round ligament. The procedure is repeated through C2. Both tip tubings are pulled and TVT is made taut symmetrically ensuring the elevation of the prolapsed vault. Excess TVT tips are trimmed and the TVT strips are anchored to ASIS bilaterally through a polypropylene 2-0 suture taken through the periosteum.

Laparoscopically, reperitonealisation of TVT is completed using vicryl 2-0 sutures. It is essential to ensure that the TVT does not come in contact with ureter, urinary bladder

or rectum. Haemostasis is confirmed, and ports are closed after reducing pneumoperitoneum.

Vaginal manipulator is removed.

Although our patients were admitted for a mean of 2 post-operative days, this procedure is safe enough to be done as a day-care procedure. Twelve patients were included in this study. Characteristics of the study population have been mentioned in Table 1.

The mean duration of surgery was 80.4 minutes, and the mean blood loss was 16.7 ml. The patients required an average post-operative stay of 2 days. None of the patients had major complications and all patients recovered satisfactorily. None of the patients experienced recurrence or chronic complications at a mean follow up of 4.9 months. Surgery parameters are mentioned in Table 2.

Table 1: Patient characteristics.

S. no.	Age (years)	Grade of vaginal vault prolapse	Comorbidity
1	55	III	HTN, DM
2	63	II	IHD
3	62	III	HTN
4	78	IV	DM
5	48	III	HTN
6	72	III	DM
7	45	IV	-
8	52	IV	HTN
9	56	III	-
10	66	II	HTN, IHD
11	48	III	HTN, Hypothyroid, DM
12	45	III	HTN

Note: HTN- Hypertension, DM- diabetes mellitus, IHD- ischemic heart disease.

Table 2: Surgery parameters.

S. no.	Duration (min)	Blood loss (ml)	Hospital stay (days)	Complications
1	60	20	2	No
2	120	20	3	No
3	60	20	3	No
4	120	10	2	No
5	90	15	2	No
6	60	10	2	No
7	60	20	2	No
8	60	25	3	No
9	180	20	2	No
10	60	10	1	No
11	45	15	1	No
12	50	15	1	No

Table 3: Parameters.

Parameters	Sacrocolpopexy (Pan et al)	Current Study
Cases	262	12
Mean duration	214.3 mins	80.4 mins
Mean blood loss	160.3 ml	16.7 ml
Conversion	2.3%	0%
Stay	4.7	2
Intra-op complications	8.4%	0%
Post-op complications (major)	3.1%	0%
Follow up duration (mean)	15.6 months	4.9 months
Recurrence	0.5%	0%

DISCUSSION

More than 40% of women above 40 years have pelvic organ prolapse.⁵ The incidence of vault prolapse requiring surgery has been estimated to be 36 per 10,000 women years.⁶ The risk of prolapse following hysterectomy is 5.5 times higher in women whose initial indication for hysterectomy was pelvic organ prolapse as compared to other indications.⁷ Vaginal vault prolapse is often associated with other compartment defects (cystocele, rectocele, or enterocele), which makes it a challenging condition to treat.⁸ There is a growing recognition that adequate support for the vaginal apex is an essential component of a durable surgical repair for women with advanced prolapse.⁷ Because of the significant contribution of the apex to vaginal support, anterior and posterior vaginal repairs may fail unless the apex is adequately supported.⁹

Pan et. al. has performed a meta-analysis of the short-term and long-term results of sacrocolpopexy and found an average intra-operative complication rate of 8.4% and post-operative complication rate of 13.9%. The results of this study are compared with our study in Table 3.

The advantage of our technique was the simplicity of the procedure, low risk of intra-operative complications or blood loss and no recurrence in short term.

The limitations of our study included the small sample size and the short mean follow up duration. In our opinion, the technique has a short learning curve and good reproducibility with potential for good long-term results.

CONCLUSION

Our novel technique of LVVLS with fixation to ASIS is an easy to learn technique for the treatment of vaginal vault prolapse with a potential for near perfect long-term results. It achieves its goal to avoid any inadvertent vascular injury

or neurological entrapment. A longer follow-up and a larger sample size will further help us to definitely confirm our results.

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Ethical approval: Not required

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