

Original Articles

Abdominal Sacral Colpopexy In Treatment Of Vaginal Vault Prolapse: By Less Invasive Method

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Abstract:

Objective: To assess the outcomes of abdominal sacral colpopexy in less invasive method.

Study design: It was a prospective study conducted in Comilla Medical College Hospital and Comilla General Hospital during the period from 2005 to 2009.

Method: Thirty women with vaginal vault prolapse were selected by inclusion and exclusion criteria in a consecutive, exhaustive method. Primary outcome measurements were included subjective, objective and patient-determined success rate. Secondary outcome included the impact on bowel, bladder, sexual function and quality of life.

Result: Result shows that, vault prolapse is mostly associated with older patients, age more than sixty (66.7%), para >5 (60%) and menopausal women (66.7%). Vault prolapse was mostly associated with cystocele (93.3%), stress incontinence (76.7%) and more common following abdominal hysterectomy (70%). During operation the dissection was less (3-4cm). Average operating time was 54.33/min; average estimated blood loss was 49.17/ml. One patient required blood transfusion, one developed haematoma during surgery, no gut injury or haemodynamic instability developed. Post operatively, no internal haemorrhage, 4 patient developed fever (13.3%), wound infection one (3.3%), UTI 4 patients (13.3%), no voiding difficulty or thromboembolism and one patient developed mesh rejection (3.3%). After one year follow-up success rate was 96.7%.

Conclusion: Abdominal sacral colpopexy is a safe and effective method for correction of vaginal vault prolapse.

Key words: Vault prolapse, Sacral colpopexy.

Introduction:

Female pelvic organ prolapse refers to the descent of the pelvic organs towards or through the vagina. Approximately 50% of parous women will have some degree of prolapse. The life time risk for surgery for prolapse has been estimated to be around 11.1% while 30% will undergo re-operation for recurrent prolapse¹.

Among female pelvic organ prolapse, vaginal vault prolapse is new threat. The true incidence of vaginal vault prolapse is not known; the prevalence figures suggested being approximately 0.2-1%². Hysterectomy for pelvic organ prolapse appears to be a particular risk factor. Vaginal vault prolapse occurs

in equal numbers after abdominal or vaginal hysterectomies. ^{1, 3,4} Treatment can be either conservative, pessaries or surgical. More than 40 different operations for the treatment of vaginal vault prolapse have been described.³

Abdominal sacral colpopexy with mesh interposition is widely accepted surgical method.^{3,6} This procedure involves dissecting the bladder peritoneum and peritoneum over posterior vaginal wall away from the vault, then suspending the vault to the ant longitudinal ligament of the sacrum using a mesh. The technique most of the surgeon used is that described by Timmons,¹ where through a low

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Pfannenstiel incision, the bladder and rectum are dissected of the vagina. The dissection extends approximately two-thirds (5-8cm) the way down the ant vaginal wall and posterior to the rectovaginal septum. The peritoneal dissection is continued along the right side of the rectosigmoid to reach the sacral promontory. The mesh is then sutured onto the vaginal vault and posterior wall of the vagina and suspended to the sacral promontory^{1,3,4}. The peritoneum is then closed over. Several types of synthetic materials including Mersilene mesh, Goretex, Prolene etc have been used as graft^{5,6,7}. The mode of action of these materials is induction of collagen formation and replacement by host connective tissue.⁷

Common complications related to abdominal sacral colpopexy are intra-operative bleeding which may be related to degree of separation, voiding problem, stress incontinence^{4, 8, 9}. Some studies show that dyspareunia may occur when separation of vagina becomes more and ligation of mesh becomes lower level at vagina^{8,9}. So, it is necessary to correlate the vaginal dimension with degree of separation during surgery. In this study, it has been planned to do this complicated surgery in a less invasive method with less dissection, resulting less blood loss, consuming less time for operation, using less blood transfusion and with high efficacy in follow-up period. There are no available data or study reports like this simpler method used in this study. The available data shows methods used for repair of vaginal vault prolapse are extensive method of separation and also associated with other repair operation.

Material and Methods:

A prospective study on 'Abdominal sacral colpopexy in treatment of vaginal vault prolapse: by less invasive method' was carried out in Comilla Medical College and Comilla General Hospital during the period of 2005 to 2009. Participants were selected from the women who required surgical treatment for vaginal vault prolapse, and attended gynaecology department at the Comilla Medical College and General hospital, Comilla. Women with symptomatic post hysterectomy vaginal vault prolapse that extended to or beyond the introitus were eligible for inclusion. On the other hand, women who had undergone a previous sacral colpopexy, significantly short vagina, associated other medical disorder like DM, renal impairments or not fit for major surgery were excluded from the study. Before enrollment, all women completed standardized pelvic

floor questionnaires that related to prolapse, bowel, bladder and sexual function. Vaginal examinations were completed in standing and left lateral position with a Sim's speculum during a maximum Valsalva procedure; the prolapse was graded using a modified Baden Walker classification.¹⁰ Voiding dysfunction was diagnosed if the maximum urinary flow rate was <15ml per second on two occasions, with a voided volume >150ml and residual urine >100ml¹¹. Once agreed to participate in the study, women were allocated by inclusion and exclusion criteria. Sampling method was consecutive and exhaustive. All subjects provided written informed consent before the surgery. Pre-designed questionnaire was supplied to all patients for record of urinary and defecation problems, dyspareunia and quality of life before and after operation.

Abdominal sacral colpopexy was done under spinal anesthesia or general anesthesia. Before opening the abdomen vaginal vault was pushed by sponge holding forceps raped with gauze per vaginally by a person to elevate the cephalad. After a Foley catheter is placed in the bladder, a Pfannenstiel incision is performed to open the abdomen. After opening abdomen, a previously weighted surgical mob or pack was placed within the peritoneal cavity. Bladder was mobilized to below and anterior. Vaginal vault was identified and held at two corners by two Allis tissue forceps. Peritoneum over the vaginal vault was incised and separated. Anteriorly, bladder was separated from anterior vaginal wall for a short length, approximately upto 3-4cm and posteriorly, peritoneum over the posterior aspect of the vaginal vault was also dissected for a length, approximately upto 3-4cm. Then a piece of Prolene mesh, non absorbable Poly propylene mesh, (Ethicon-Division of Jonson & Jonson comp.LTD), PMM-I, size-15cm×15cm, approximately 2.5 to 5cm wide was taken. Lower end of the mesh was first splitted in to 4 pieces and every alternate piece was fixed into the anterior and posterior vaginal wall of vagina by interrupted suture with Prolene I cutting (non absorbable) and vicryl I cutting (delayed absorbable). Next, the rectum and sigmoid colon was retracted away from the midline with the help of an assistant. The peritoneum over Sacrum and rectovaginal space was not opened. The sacral promontory and anterior longitudinal ligaments of the body of the sacral vertebrae was identified by palpation. The middle sacral vessel and the right ureter were also identified by palpation. The upper end of the mesh was then

attached to the anterior longitudinal ligament at the sacral promontory level, by Prolene and vicryl 1-cutting suture. At this point much care was taken to avoid injury to the middle sacral vessel and the right ureter. The length of the mesh, which was attached from the vaginal vault to the sacral promontory, was about 4-5cm. During fixation of upper end of the mesh to the sacral promontory, much caution was taken to avoid traction on the graft to prevent changes in the angular relationship of the urethra and bladder, which would result in postoperative stress urinary incontinence. Vagina was gently elevated but without tension as it would also develop postoperative dyspareunia. The mesh was then trimmed. Abdominal pack and retractor were removed. Abdomen was closed in layers. Surgery was done by same surgeon in each case. Whole operating time was calculated by stop watch. The soaked mob or pack was weighted again. All women received perioperative antibiotic, analgesic therapy. Patients were observed for vital sign, any internal hemorrhage, bowel and bladder move and sign of infection very carefully at postoperative period.

Follow-up: Outcome reviews were performed at 4 weeks, 3 months, 6 months and annually thereafter. At postoperative periods, data was recorded which include, inpatient and catheter days, any complications and return to normal daily activities. At 1 month, 3 months, 6 months and one year period, the postoperative evaluation was repeated and included history and symptom of any recurrence, vaginal examination, multichannel urodynamics, any dyspareunia and quality of life questionnaires. Women with no symptoms of prolapse or other sign of recurrence were classified as a subjective success. Objective success was those women who, on examination, had no vaginal prolapse during a Valsalva maneuver. Patient satisfaction was scored on a visual analog scale from 0 to 100 ¹¹ Data was collected in a pre-designed questionnaire and analyzed accordingly.

Ethical clearance and consent: Due ethical clearance was taken from the concerned bodies of the mentioned institute and written consent from the participants were taken before operation.

Observation and Result:

Table I. shows base line characteristics of study populations. Age distribution shows, 33.3% study population was aged between 30-60 years. Old women (>60) were 66.7%. Para >5 were about 60.0%. Vault prolapse in perimenopause women was (33.3%) and in postmenopause was 66.7%.

Table I

Base line characteristics of study population:

| Parameter | n-30 |
|-------------------|------|
| Age (Years) | |
| <30 | 0 |
| 30-60 | 10 |
| >60 | 20 |
| Parity | |
| <3 | 01 |
| 3-5 | 11 |
| >5 | 18 |
| Menopausal status | |
| Perimenopause | 10 |
| Postmenopause | 20 |

Table II shows physical findings before operation. Both 2nd and 3rd degree vault prolapse was 43.3%. Associated other prolapse was Cystocele (93.3%), Rectocele (73.3%) and Enterocele was 33.3%. Stress incontinence was associated 76.7%, dyspareunia was 23.0%. Associated general condition was good in case of 63.35 patients; chronic cough was in 16.7%, obesity associated with 13.3% cases, constipation 06.7%. No other concomitant operation was done for correction of associated other pathologies.

Table II

Physical findings before operation:

| Parameter | n-30 |
|-------------------------------|------|
| Degree of prolapsed | |
| 1 st degree | 04 |
| 2 nd degree | 13 |
| 3 rd degree | 13 |
| Associated prolapsed | |
| Cystocele | 28 |
| Rectocele | 22 |
| Enterocele | 10 |
| Associated complications | |
| Stress Incontinence | 23 |
| Dyspareunia | 07 |
| Others | |
| Associated General conditions | |
| Chronic cough | 05 |
| Obesity | 04 |
| Constipation | 02 |
| Good | 19 |
| Any previous Operations | |
| Abdominal hysterectomy | 21 |
| Vaginal hysterectomy | 09 |

Table III shows per operative finding of patients. Operating time was 54.33/min and avg blood loss was 49.17/ml. Blood transfusion (3.3%), one patient developed haematoma (3.3%), all patients were haemodynamically stable (100%).

Table III
Operative variables of patients:

| Parameter | Average |
|--------------------------|---------|
| Operating time/min | 54.33 |
| Estimated blood loss/ml | 49.17 |
| Blood transfusion/unit | 01 |
| Haematoma developed | 01 |
| Any gut injury | 0 |
| Haemodynamic instability | 0 |

Table IV shows post operative complications of study populations. No internal haemorrhage occur (100%), fever developed (13.3%), wound complication (3.3%), UTI (13.3%), Mesh rejection (3.3%) and no voiding difficulty, no thromboembolism occur. Average hospital stay was 05.63/day.

Table IV
Post operative complications:

| Parameter | n-30 | Percentage % |
|----------------------------|------|--------------|
| Febrile morbidity | 04 | 13.3% |
| Wound complication | 01 | 3.3% |
| Urinary tract complication | 04 | 13.3% |
| Mesh rejection | 01 | 3.3 |

Table V shows outcome during one month/3rd month/6th month/ one year. In case of 96.7%, there was no recurrence, no voiding difficulty, no stress incontinence, no dyspareunia and in 80% cases, apical support was good.

| Parameter | Peggy Geomini ⁷ (data in Average) | Marie Fidela et all ¹⁵ (data in range) | Christopher et all ⁴ (data in range) | Current study (data in Average) |
|--------------------|---|--|--|------------------------------------|
| Operating time/min | 127 | 95-372 | 45-100 | 54.33 |
| Blood loss/ml | 412 | 50-700 | 100-1100 | 49.17 |
| Hospital stay | 12 | 2-12 | 3-16 | 5.63 |

Table-V

Outcome during Follow-up: One month/3rd month/6th month/ One year:

| Parameter | 1st month | 3 rd month | 6 th month | One year |
|---------------------|-----------|-----------------------|-----------------------|----------|
| Voiding difficulty | 01 | No | no | No |
| Stress incontinence | 01 | No | no | No |
| Dyspareunia | no | 01 | no | No |
| Any recurrence | no | No | no | 01 |
| Other complication | no | No | no | No |

Discussion:

Abdominal sacral colpopexy for repair of vault prolapse is the "gold standard" ¹ and use of polypropylene mesh has success rate 68% to 100% ^{7, 14}. Success outcome includes per operative blood loss, operating time, post operatively the impact on bowel, bladder, sexual function and quality of life. In this study, operation procedure was less invasive. Less dissection was done both anterior and posterior (3-4cm) in comparison to other studies. In different studies, separation was up-to 5-8cm or 2/3rd of vagina ^{3,4}. Blood loss was also significantly more (100-1100/ml) ^{4, 5, 7}. But in this study, as dissection was less, bleeding was significantly less (49.17/ml) and 96.7% patients require no blood transfusion. Only one patient (3.3%) requires blood transfusion due to development of haematoma. Other studies showed operating time is longer (45-100/min) ^{4, 5, 7} but in this study, result shows, average operating time was 54.33/ min. Due to less handling any gut injury did not occur and patients were haemodynamically stable (100%) in current study. Post operative complications were less in this study in comparison to other studies. Only 3.3% patient developed wound infection, mesh rejection 3.3%, 13.3% developed fever which was much less in comparison to other studies. ^{2, 3, 7} Mesh rejection was managed by further laparotomy and removal of rejected mesh.

Average hospitals stay also less (05.63/day) in comparison to other studies. No patient died and morbidity was less. During one year follow-up period, one recurrence was reported (3.3%) and success rate was high (96.7%).

In following table a comparison is shown regarding operating time; blood loss and hospital stay among previous different studies and current study.

Conclusion:

The treatment of vaginal vault prolapse is really difficult and still challenging problem. Abdominal sacral colpopexy is widely practiced surgical method for correction of vaginal vault prolapse. The procedure of choice for reconstructive surgery to vaginal vault prolapse should be tailored to the individual patient and be of low morbidity and mortality, but at the same time long-term durability. There is no single procedure that is able to satisfy all these requirements and success rates are also difficult to evaluate. As because patients with vaginal vault prolapse are very old aged group, most of them are debilitated, weak and unfit for long time surgery with much dissection, this less invasive method can be applied for these patients. In this study success rate is 96.7%. During operation the extent of dissection was less (3-4cm), where as in different studies it was seen, dissection rate was more (5-8cm). Here less dissection and less bleeding was occurred (49.17/ml). Average operating time was 54.33/min, where in other studies; operating time was longer (95-372/min). In comparison to other studies associated other complication was also less. The weakness of the study is, in this study, concomitant repair operation (like repair enterocele) was not done, as it will require more time and may cause more blood loss. But it should also be mentioned that, the enterocele was auto corrected in some extent as vaginal vault was elevated and pouch of Douglas was shortened by this sacral colpopexy. So, recommendations that more study require comparing previous traditional methods and this newer less invasive method regarding efficacy. It is also recommendaed that as the identification of anterior longitudinal ligament was done without peritoneal dissection, surgeon's skill is much required for this method.

References:

1. Charlotte C, Vik K. Management of vault prolapse. *Reviews in Gynaecological Practice* 5 (2005); 89-94.
2. Symmonds RE, Williams TJ, Lee RA. Posthysterectomy enterocele and vaginal vault prolapse. *Am J Obstet Gynaecol* 1981; 140: 852-9.
3. Beer M, Kuhn A. Surgical techniques for vault prolapse: a review of the literature. *European Journal of Obstetrics & Gynaecology and Reproductive Biology*.119; 2005:144-155.
3. Christopher M, Aymen Q, Peter D, Marcus C, Ann C, Philip S. Abdominal sacral colpopexy or vaginal sacrospinous colpopexy for vaginal vault prolapse: A prospective randomized study. *Am J Obstet Gynaecol*. 2004; 190:20-6.
4. Charlotte, Vik . Surgical repair of vaginal prolapse: A gynaecological hernia. *International Journal of Surgery*. 2006; 4:242-250.
5. Bai SW, Kwon HS, Chung DJ. Abdominal high uterosacral colpopexy and abdominal sacral colpopexy with mesh for pelvic organ prolapse. *International Journal of Obstetrics & Gynaecology*. 2006;92:147-148.
6. Peggy, Hans B, Nelleke B, Ben M. Vaginal vault suspension by abdominal sacral colpopexy for prolapse: a follow up study of 40 patients. *European Journal of Obstetrics & Gynaecology and Reproductive Biology*. 94; 2001:234-238.
7. Victoria H, Halina Z, Linda B, Ingrid N, Nancy J, Holley R, et all. Sexual function before and after sacrocolpopexy for pelvic organ prolapse. *Am J Obstet Gynaecol*. 2007;197:629.e1-629.e6.
8. Anne W, Mark W , Marion P. Sexual function and vaginal anatomy in women before and after surgery for pelvic organ prolapse and urinary incontinence. *Am J Obstet Gynaecol*. 2000; 182:1610-5.
9. Paraiso MF, Ballard LA, Walters MD, Lee JC, Mitchinson AR, Pelvic support defect and visceral and sexual function in women treated with sacrospinous ligament suspension and pelvic reconstruction. *Am J Obstet Gynaecol*. 1996;175:1423-31.
10. Maher CF, Dwyer PL, Carey MP, Gilmour DL. Burch colposuspension for repeat retropubic continence surgery. *BJOG* 1999; 106:719-24.
11. Urebersax JS, Wyman JF, Shumakar SA, Short form to assess life quality and symptom distress for urinary incontinence in women: the

- incontinence impact questionnaire and urogenital distress inventory. *Neurourol Urodyn.* 1995;14:131-9.
12. Shumakar SA, Wyman JF, Urebersax JS, McGlish D, Fantl JA. Health related quality of life measures for women with urinary incontinence: the urogenital distress inventory and the incontinence impact questionnaire. *Qual Life Res.* 1994; 3:291-306.
 13. Patrick H. Management of recurrent vaginal prolapse. Review in *Gynaecological Practice.* 2003. 3:109-113.
 14. Marie FR. Laparoscopic and abdominal sacral colpopexies: A comparative cohort study. *Am J Obstet Gynaecol.* 2005; 192:1752-8.
 15. Marie F R et all. Laparoscopic and abdominal sacral colpopexies: A comparative cohort study. *Am J Obstet Gynaecol.* 2005; 192:1752-8.