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SACROSPINOUS LIGAMENT FIXATION (SSLF) FOR VAULT SUSPENSION IN ADVANCED PELVIC ORGAN PROLAPSE

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ABSTRACT
Our aim was to evaluate the efficacy of sacrospinous ligament fixation(SSLF) for vault suspension in advanced pelvic organ prolapse. This study had a prospective design. The study was carried from March 2012 to February 2014 and women who had pelvic organ prolapse to or beyond the hymen were selected. SSLF was performed and patients were followed up after 2 weeks, 1 month, 3 months and 6 months. Out of 40 patients selected, mean age was 43.3 years. Duration of prolapse ranged from 1 to 18 years. Most of them were para 3 or more. Repeated child birth was the commonest cause of prolapse. An average duration of hospital stay was 7.5 days. Four patients came with previous Fothergill's repair. Vault prolapsed following abdominal and vaginal hysterectomy was observed in four cases. 80%(32/40) of patients presented with 2^{o} uterine prolapse with cystocele & rectocele and 4 cases came with recurrent prolapse. Majority(28/40) of cases underwent vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy along with SSLF. Postoperative immediate complication was hemorrhage observed in 8 cases managed conservatively. Pain right buttock was observed in 6 cases, rectal injury observed in one case and persistent vaginal bleeding for 1 month observed in 3 cases. 6(15 %) patients developed cystocele after this procedure. UTI observed in two cases and treated. We can conclude from our study that bias and experience of surgeons have historically dictated the approach and route of access with restoration of vaginal anatomy being the primary goal. However, transvaginal SSLF approach has the advantage of decreased operative time, decreased incidence of adhesion formation, less postoperative complications and quicker recovery.

INTRODUCTION

Pelvic organ prolapse is a global health problem affecting adult women in all ages. 1 in 9 women will undergo surgery for prolapse or incontinence by age 80, and 30% of those will require re-operation [1]. Surgical management of pelvic organ prolapse can be challenging because multiple support defect frequently coexist .It is rare to find isolated defect in anterior or posterior compartment without also finding an apical defect. Many experts would argue that adequate suspension of the apex is the corner stone of prolapse repair. Whereas many procedure have been described for repair of apical prolapse. But a paucity of high quality data exist to which procedure for apical prolapse provide optimal durability and patient safety. Moreover sacrospinous ligament fixation is one of the best studied of vaginal procedure for treating apical prolapse. Level I evidence from 2 randomized controlled trials suggest that whereas slightly inferior to sacrocolpopexy in anatomic restoration, sarcospinous ligament fixation results in equal patient satisfaction [2].

METHODS

The study was carried from March 2012 to Feb 2014 and 40 women who had pelvic organ prolapse to or beyond the hymen were selected. Two experienced surgeons performed the operations. The surgical technique is described below. They were followed up after 2 weeks, 1 month, 3 months and 6 months. The duration of follow up ranged from 6 month to 3 years with mean±SD of 21±15 months. The technique and protocol of the study design were approved by the ethical committee of the institution and informed consent obtained from the patients and her responsible relatives.

Technique

The posterior vaginal wall is incised in the midline from the perineal body to the apex. The rectovaginal space is opened by gently pushing the rectum medially, and rectal pillar is perforated. Once the perirectal space is entered, the ischial spine can be palpated and the ligament found medially. Two long specially designed long single bladed right angled vaginal retractor were used to displace rectum medially to expose the ligament. The pudendal neurovascular bundle lies just medial to the ischial spine, so surgical assistants should be cautioned to hold the retraction steady. With the sacrospinous ligament under vision, the Deschamps ligature carrier hook [Fig-1] preloaded with suture was used to pierce the ligament 1.5-2 cm medial to the ischial spine starting from the anterior superior border in an anticlockwise manner passing the suture through the ligament. Care was taken not to place the suture too far laterally or behind the ligament to avoid injury to the pudendal nerve, internal pudendal vessels and ureter. A nerve hook is used to retrieve the sutures. Finally the ends of the sutures were passed through the posterior vaginal wall close to vault and held for later tying. The rectovaginal septum was reconstituted and after excision of the mucous membrane from the posterior vaginal wall vagina was closed and perineorrhaphy was done. Now traction free end of suture after giving knot, the apex of the vagina directly fixed with the ligament without leaving a suture bridge. Vagina is packed for 24 hours. The suture material used for this procedure was delayed absorbable Polydiaxone suture (PDS).

RESULTS

There were total 40 patients selected for sacrospinous ligament fixation (SSLF). The mean age of the patients was 43.3 years [Table-1]. The youngest one was 24 years and the oldest one 65 years. The duration of the prolapse ranged from 1 to 18 years. Most of the cases were para 3 or more. The repeated child birth was the commonest cause of the prolapse. As we have done only right sided SSLF, the average time taken for this procedure was in and around 20 mins in uncomplicated cases. We discharged the patients on the 7th postoperative day. But those who were having medical problems and postoperative pain or bleeding, residing far away from the hospital stayed for longer duration. An average duration of hospital stay was 7.5 days. Table-2 depicts the medical and surgical problems associated with prolapse. Four patients came with previous Fothergill's repair. Vault prolapsed following abdominal and vaginal hysterectomy was observed in four cases. Medical disorder which are the predisposing factors include COPD (2/40), asthma (2/40), chronic constipation (4/40) were observed. Hypertension (8/40) and diabetes (4/40) may not be associate with course of the disease but significantly affect post-operative outcome. Based on the physical examination most of the patients presented with 2^{o} uterine prolapse with cystocele & rectocele were 80% (32/40) and 4 cases came with recurrent prolapse [Table-3].

Table-4 showed the operations performed with SSLF. Majority (28/40) of the cases underwent vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy along with SSLF. In 8 cases where age of the patients were below 32 years and sufficient reason to preserve the uterus we performed PFR or Fothergill's repair along with SSLF.

The dissection is specially done by fingers in a blunt manner. A window can be created by tip of the scissors. As this area is a potentially dead space, blood loss is negligible with careful dissection. But inadvertent injury to hypogastric venous plexus, inferior gluteal vessels and internal pudendal vessels create a major problem where pressure is the initial management followed by ligature of the vessels. In our study, intraoperative and immediate postoperative complication was hemorrhage observed in 8 cases managed conservatively with packing and postoperative blood transfusion required in 2 cases [Table-5]. Pain right buttock was observed in 6 cases. Pain subsided with analgesic within 7 days in 4 cases but in 2 cases it persist for more than 1 years without any detectable pathology. Rectal injury was observed in one case who had vault prolapse following Ward Mayo's operation. Persistent vaginal breeding for 1 month has been observed in 3 cases. In one case, this symptoms eventually settled after removal of the granulation tissue. A total 6 (15 %) patients developed cystocele after this procedure but most of them were asymptomatic and detected during follow up. Urinary problems in the form of UTI has been observed in two cases and treated with antibiotics.

Table 1. Demographic profile, duration of disease and hospital stay

	Range	Mean
Age	25-65 years	43.3 years
Parity	2-5	3
Duration of disease	1-18 years	8.3 years
Hospital stay	7-11days	7.5 days

Table 2. Medical and surgical problems associated with genital prolapse. (n=40)

Problem	n	%
Previous Surgery		
Fothergill's	4	10
TAH	2	5
Ward mayo's	2	5
Associated medical disorder		
COPD	2	5
Asthma	2	5
Diabetes	4	10
Hypertension	8	20
Chronic constipation	4	10

Table 3. Type of presentation. (n=40)

Type of presentation	n	%
2^{o} Uterine prolapse with Cystocele & rectocele	32	80
Vault prolapse	4	10
Cystocele & rectocele	4	10

Table 4. Operation performed. (n=40)

Operation	n	%
VH+AR+PR+SSLF	28	70
AR+PR+SSLF	5	12.5
Fothergill's with SSLF	3	7.5
Vault repair +SSLF	4	10

(VH-Vaginal Hysterectomy, AR –Anterior Colporrhaphy, PR- Posterior colpoperniorrhaphy, SSLF- Sacrospinous Ligament Fixation.)

Table-5. Postoperative Complications.

Type	n	%
Immediate		
Hemorrhage	8	20
Rectal injury	1	4
Pain right buttock	6	15
Late		
Cystocele	6	15
Vaginal bleeding	3	7.5
Pain right buttock	2	5
Urinary problems	2	5

Figure 1. Deschamps ligature carrier hook.

DISCUSSION

As women live longer and healthier lives, pelvic floor disorder continue to become even more prevalent and important health and social issue. The management of pelvic organ prolapse can be difficult because different support defects coexist. Though the true incidence of vault prolapse is unknown. But estimates in recent literature of its incidence range from 0.2% to 1.0%. Traditionally SSLF has graded as a therapeutic tool to be used only for vaginal vault prolapse [7]. However Stiphen H stated that this procedure also used as a prophylaxis against post hysterectomy vault prolapse. The main goal of any procedure aimed at suspending the vaginal vault as near as possible to normal anatomic position. Moreover the surgical correction of vaginal prolapse, remains controversial [3].

Sarcospinous ligament fixation is one of the surgical procedure used in this condition. Amreich first

described using sacrotuberous ligament to suspend a prolapsed vaginal apex [4] and Richer modified the procedure to the sacospinous ligament. David Nichols [5] popularized the procedure. It suspend the vagina to the sacrospinous ligament and brings the upper vagina over levator plate. It is generally done unilaterally although it has been described bilaterally. The right sacrospinous ligament is commonly chosen based on the hand dominance of the surgeon [9].

The overall results from sarcospinous ligament fixation have been good. In 1997 Sze and Karman reviewed the literature and 1137 patients were available for follow up with 83% cure rate [6]. Anatomic correction of the anterior vaginal wall is the most challenging caring segment to address with SSLF because anterior wall recurrence have been reported to be as high as 37% [7].

The recurrence rate has varies from 0-12% [1]. Anterior wall is more frequent .We also found cystocele (6/40) as late complication in our study. The cause of anterior prolapse wall due to exaggerated retroversion of the vagina, as pulled back ward exposing the anterior vaginal wall to more strain. However such recurrence is not necessarily symptomatic [8].

The postoperative complication in our series were few in number. Immediate postoperative complication includes hemorrhage, requiring blood transfusion caused by injury of the adjacent vessels was same as quoted in other studies [1,3]. Injury may occur from overzealous dissection or intra-operative needle passage through the sacrospinous ligament. If bleeding does occur, initially pressure should be applied to the bleeding area [9]. In our series most of the intra operative bleeding was managed by pressure packing. A patient who complains of severe postoperative gluteal pain that runs down to the posterior surface of the right leg likely has a pudendal nerve injury needs immediate removal of the suture [2]. Moreover statistics from different literatures revealed approximately 10% to 15% of patients have transient moderate to severe buttock pain on the side of sacrospinous ligament suspension [9]. It is usually self-limiting and resolve within 6 weeks post operatively. However no such complication related to pudendal nerve ligation has been observed in our series. Although gluteal pain that resolved spontaneously was seen in our study.

Persistent vaginal bleeding has been reported due to formation of granulation tissue even after 3 years of operation [3] and treated with surgical removal. In our series, we treated a patient by electro-cauterization of the granulation tissue.

The late complications includes anterior vaginal wall prolapse was observed in 5 cases. Though 2/5 had history of bronchial asthma and COPD. Most of them are asymptomatic detected during follow-up.

Although sacrocolpopexy can be performed as an alternative to sacrospinous ligament fixation, is associated with better long term result, needs longer hospital stay, potentially more postoperative morbidity and a longer learning curve compared with this procedure [10].

The evolution of illiococcygeus suspension parallels that of sarcospinous ligament fixation. In fact the only comparing SSLF and illiococcygeus suspension (case control design), subjective success rate for the procedure were similar: illiococcygeus 91% and sarcospinous ligament fixation 94% but patients satisfaction was higher after SSLF [11].

Shull [8] reported optimal anatomic outcome in 87% of women after uterosacral ligament suspension so the outcome of this procedure is not statistically significant.

Infracoccygeal sacropexy is another least well studied technique described by Petros, demanded similar efficacy and has 21% recurrence rate [12].

Abdominal sacral colpopexy was better than vaginal sacrospinous colpopexy in terms of a lower rate of recurrent vault prolapse (RR 0.23, 95% CI 0.07 to 0.77) and less dyspareunia (RR 0.39, 95% CI 0.18 to 0.86), but the trend towards a lower re-operation rate for prolapse following abdominal sacrocolpopexy was not statistically significant (RR 0.46, 95% CI 0.19 to 1.11). However, the vaginal sacrospinous colpopexy was quicker and cheaper to perform and women had an earlier return to activities of daily living [13].

CONCLUSION

Many surgical procedure have been described for suspending the prolapsed vaginal vault. The bias and experience of the surgeon have historically dictated the approach and route of the access with restoration of the vaginal anatomy being the primary goal. To do this, it is imperative that we as reconstructive surgeons understand the existing literature and its limitations. However transvaginal SSLF approach has the advantage of decreased operative time, decreased incidence of adhesion formation less postoperative complications and quicker recovery.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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