

# Sacrospinous ligament fixation for apical prolapse repair compared to other vaginal procedures

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## ABSTRACT

*The vaginal procedures for uterine prolapse and/or vaginal vault prolapse are based on the attachment of the vaginal apex at the sacrospinous ligament (SL), the uterosacral ligaments (USL) or the iliococcygeus fascia. The fixation at the sacrospinous ligament (SSL) known as sacrospinous ligament fixation (SSLF) is the most studied and performed method for apical prolapse repair. Generally, it is preferred for cases of vaginal vault prolapse post-hysterectomy compared with the suspension at the uterosacral ligament (USLS) that it is usually performed at the time of uterus removal.*

*Due to its associated high rate of recurrence, especially prolapse of the anterior vaginal wall, SSLF has been progressively abandoned in the favor of other modern vaginal procedures such as the Saba Nahedd technique. However, the frequently reported with associated complications, there are still logical reasons to continue the performance and development of the SSLF technique. In order to assess the current frequency of application and effectiveness of SSLF we have made a review on the recently published literature on the SSLF technique focusing on the rate of success and recurrence, the peri- and postoperative complications, its impact on the daily activities and sexual function. We have selected systematic reviews, follow-up and retrospective studies as well as meta-analyses which have been published in the last 10 years in the German or English language. The aim of this article is to describe the SSLF technique and its advantages in the treatment of severe uterovaginal or vaginal vault prolapse.*

**Keywords:** sacrospinous ligament fixation, uterine prolapse, uterosacral ligaments

## Abbreviations

SL = sacrospinous ligaments; USL = uterosacral ligaments; SSLF = sacrospinous ligament fixations; USLS = uterosacral ligament suspension;

## INTRODUCTION

The use of the sacrospinous ligament (SL) as structure of attachment for the pelvic organs was initially described by Sedera in 1958. The

reported results were satisfactory the technique being further introduced in more uro-gynecologic centers in Europe while in the United States of America the method became in the early 70s the most frequent performed tech-

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nique in women with severe uterovaginal- or vaginal vault prolapse (1,2). The apical compartment together with the three levels on which the suspension structures are positioned must be preoperatively evaluated because defect at any of the three levels require a different operation (3). At the first level, a defect may imply the uterosacral or cardinal ligaments or the proximal part of the recto-vaginal fascia (4). A deterioration of the connective tissue of these structures can affect all of the three vaginal compartments resulting in different dysfunctions as: urine incontinence (in the anterior compartment), nycturia, polachiuria (in the middle compartment) and lombar pains, incomplete bladder or intestinal emptying (in the posterior compartment) (5). The normalization of the function of the support structures in level one requires the restoration of the connective tissue of the USL and the SSL (6). The use of the SSLF is primary indicated for apical prolapse (vaginal vault or uterine prolapse) as well as enterocele after hysterectomy while for concomitant anterior and/or posterior defects are other vaginal procedures recommended (7). The main advantage of the SSLF is the normalization of the vaginal axis and length while the vaginal route implicitly involves a rapid recovery, shorter admissions in hospital, a lower rate of postoperative complications and no general anesthesia (8). Depending on the length and width of the vagina, the SSLF can also bilaterally performed although most frequently the right side is used in order to avoid rectum injuries (9). The aim of this article is to present the technique of the SSLF with regard to its efficiency, peri- and postoperative complications, recurrence rate compared with other vaginal procedures.

### Techniques description

After assessing the length of the vagina, the SSL and the coccygeus muscle will be identified and the point where the vagina or uterus will be anchored to the SSL will be established (10). The first step is to open the pararectal space by incising the posterior wall of the vagina between the perineal body and the vaginal apex. Further, the dissection of the vaginal mucosa is continued until the operator achieves the ischial spine. The SSL can be palpated medially to the ischial spine until the distal part of the sacrum once the right pararectal space is opened. The visualization of the SSL can be improved by using three angle retractor which are generally placed superiorly and laterally. Different devices can be

used to place sutures through the SSL almost 2 cm medial from the ischial spine (11). Then the sutures are made through the SSLF and the coccygeus muscle from the proximal to the distal border of the complex. The suture consists of a 1,5 m loop of non-absorbable monofilament polydioxanone so that every loop actually has actually two sutures. These are then passed through the vaginal apex and the sutures passed through the SSL are tied. In this way, the SSLF attaches to the vaginal epithelium which in time will integrate with the SSL (10,11).

However, the standard SSLF technique has been over the years changed. One of the popular modified SSLF technique is the Michigan technique in which the vaginal walls are brought together to the SSL (12). The principle of this technique is to simultaneously repair the anterior vaginal in order to prevent a possible anterior vaginal wall complication. The operator will place the delayed absorbable sutures through the SSL, the anterior and posterior vaginal wall and tie them on the SSL (11,12). The modified Miching method appears to have good success and satisfaction rates, approximately 76% of patients reporting to have a better life quality after SSLF with the Michigan technique (13).

### Complications and outcomes

The vaginal SSLF is generally associated with a lower peri- and postoperative morbidity operative compared to the abdominal sacrocolpopexy. However, intraoperative hemorrhage after lesion of the coccygeal branches of the inferior gluteal artery was reported in approximately 2% of cases (14). The most used hemostatic methods include initially clips, hemostatic agents or vaginal packing while embolization through computed tomography angiography is generally preferred when the bleeding is too severe (15). The injury of the pudendal vessels can also cause bleeding that is normally stopped after packing the ischioanal fossa (16).

Another intraoperative complication is the entrapment of the sciatic nerve during places the sutures on the SSL reported in 1.8 % of cases (17). This can be avoided by placing the sutures in the lateral third segment of the ligament which is not perforated by the branches of the sciatic nerve (18). Postoperatively the patients typically claims on paresthesia and pain that radiates on the posterior part of the leg. Once diagnosed, the symptoms will relief only after removing the sutures on the SSL (17,18).

When it comes to postoperative complications, observational studies reported infections

such as fever, cystitis, abscess, wound healing or septicemia to appear in almost 4.5% of cases while ureteral or intestinal injuries have prevalences rates of 2.9% and 1% approximately (19). Cystotomy and enterotomy have been isolated reported. As regards the sexual activity, the evaluation of the satisfaction surveys in randomized trials (20) in which SSLF has been compared with abdominal sacral colpopexy, revealed 36% of women complaining on dyspareunia after SSLF mainly due to the shortening the vaginal length and thickening of the vaginal mucosa. Other observational studies reported between 3 and 10% cases of dyspareunia (21).

Compared to other surgical methods for apical prolapse, between 70% and 98% women reported an improvement of the prolapse associated symptoms after SSLF (22). Recurrence rates for apical and anterior wall prolapse are estimated to be between 2% and 9% and between 6% and 29% respectively (23). When compared with the Saba Nahedd technique that uses a special sling to anchor the isthmus of the uterus at the fascia of the rectus abdominis muscle, the success and recurrent rate for SSLF are inferior to those reported for the Saba technique which achieve almost 95% and less than 0,5% respectively (24). Moreover, the postoperative evolution and patient's satisfaction were also higher (24). However, studies have shown a similar efficiency between unilateral SSLF and bilateral iliococcygeal suspension in terms of intraoperative bleeding, nerve entrapment and postoperative lower urinary tract complications (25). On the other hand, SSLF is associated with a higher peri-and postoperative morbidity as well as recurrence rate compared to the modified McCall culdoplasty (26). Lo and co. (27) examined the effectiveness of combining the SSLF with other procedures that address prolapse of anterior and/or posterior compartment and reported a success rate of 91,8% after 30 month

of follow up of women with POP who undergone SSLF and anterior transobturator mesh.

One other popular transvaginal procedure for apical prolapse that also uses native tissue is the USLS has a better efficiency in anterior vaginal wall prolapse compared to the SSLF but it increase the risk for intraoperative ureteral lesions (28). However, the risk of ureteral lesions must be assessed in comparison with the risk of neuropathy after nerve lesions during a SSLF. The OPTIMAL randomized trial- The Operations and Pelvic Muscle Training in the Management of Apical Support Loss -compared USLS with SSSL in 374 women with apical prolapse stage 2-4 and urinary incontinence did not achieve to demonstrate any statistically significant difference between SSLF and USLS when it comes to success rate (60.5% vs 59.2%), dyspareunia or life quality (29,30).

## CONCLUSIONS

The vaginal route for apical prolapse is a good alternative especially when there are contraindications to laparotomy such as comorbidities or risk factors for mesh erosions and when concomitant repair of the anterior and/or posterior compartment is also planned. The transvaginal SSLF is the most popular and studied surgical procedure for apical prolapse repair and proved to have similar results to bilateral iliococcygeal suspension and USLF. The SSLF and USLF are equally effective but each of them is associated with different risks of complications. Moreover, it is a cheap and relative easy technique but it requires a sufficient vaginal length and is generally aimed at repairing only the apical defect. The rate of vaginal anterior wall prolapse after SSLF is high. The Saba technique is definitely superior to the SSLF in terms of success and recurrence rate.

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