

Prolapse of the pelvic organs. The Saba Nahedd procedure of attaching the uterine isthmus with strip at the the rectus abdominis muscle sheath. Anatomic success and subjective cure rates on a series of 103 cases

Abstract

The surgical treatment of prolapse of the pelvic organs (POPs) is indicated in women with prolapse-associated symptoms such as pelvic pains (PPs), obstructive voiding (OV), constipation or bulge symptoms. Our aim was to investigate anatomic success and cure rates of the surgical technique of attaching the uterine isthmus with two strips at the lateral and medial extremities of the rectus abdominis sheath. The technique has been developed by Saba Nahedd and has been applied on 103 cases of apical prolapse grades I-IV and/or cystocele per magna and/or rectocele. Our study consisted of 103 patients aged between 31 and 81 years who were diagnosed between 2013 and 2018 with symptomatic apical prolapse of stages I-IV and/or cystocele per magna and/or rectocele. The pelvic organ prolapse quantitation system has been applied for the classification of the apical prolapse. For the other vaginal compartments we used the traditional definitions of cystocele per magna. In order to obtain informations related to one or another vaginal compartment we have used a questionnaire of examination at the presentation in which the patients have been asked about their symptoms. The questionnaire was applied at one, three, six and twelve months to see if recurrences and relief of symptoms have been obtained or not. We applied descriptive statistics and a nonparametric test-the Mcnemar to see the significance of the symptoms relief in the immediate postoperative period as well as at one, three, six and twelve months. We have also evaluated the postoperative complications, the rate of apical prolapse recurrence as well as the impact on the rates of cystocele and rectocele. The results showed a statistically significant decrease in the rates of PPs, pelvic pressure symptoms, constipation and OV at one, three, six and twelve months after surgery compared to the symptoms reported at the initial presentation. The rate of apical prolapse recurrence was 2.9%. Significant changes in the rates of cystocele per magna and rectocele have also been reported. Almost 35.92% reported the resumption of the sexual activity after 12 months compared to 0.97% at one month. The uterine-sparing procedure developed by S.N allows the reestablishment of the normal pelvic anatomy and has resulted in high anatomic success and subjective cure rates. However, the patients should be informed on the benefits and risk of the POPs procedure compared to other techniques that imply a concomitant vaginal hysterectomy.

Keywords: apical prolapse, pelvic pain, constipation, recurrence

Abbreviations: POPs= prolapse of the pelvic organs; POPQ= pelvic organ prolapse quantitation system; PPs= pelvic pains; PPS= pelvic pressure sensation; OV= obstructed voiding.

Introduction

Symptomatic prolapse of the pelvic organs (POPs) refers to pelvic pains (PPs), pelvic pressure sensation (PPS), slow urine stream, sensation of incomplete emptying of the urinary bladder or, rarely, urinary retention⁽¹⁾. Association of a posterior compartment prolapse can

cause constipation and/or stool outlet obstruction⁽²⁾. Each symptom generally correlates with the prolapse of one of the three compartments, however, as herniation of one compartment is very often associated with herniation of another, the symptoms can also coexist⁽³⁾. Symptomatic POPs necessitates a surgical reconstructive

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intervention that addresses and corrects the defects in all of three compartments. The reconstructive intervention can include a concomitant hysterectomy or can preserve the uterus by attaching the uterine isthmus or cervix to a structure of support together with the reestablishment of the normal anatomy of the anterior and posterior vaginal compartment⁽⁴⁾. The decision whether to preserve or not the uterus depends on the associated comorbidities, hormonal status of the patient as well as the sexual function of the patient⁽⁵⁾.

A uterine-sparing procedure is associated with lower perioperative events and has a less significant impact on the patient's body image as it permits preserving the fertility and the sexual function. With regard to the risk of recurrence, there are controversial information upon the rate of prolapse recurrence. A randomized study conducted by Dietz and contributors⁽⁶⁾ showed that a transvaginal sacrospinous hysteropexy is associated with a rate of prolapse recurrence of 27% after 12 months compared to a vaginal hysterectomy with the suspension of the vaginal cuff whose rate of prolapse recurrence was only 3%. However, results of another large study did not show a statistical significant association between hysteropexies and prolapse recurrence⁽⁷⁾. Moreover, the peri- and postoperative complications rates of sparing- and nonsparing uterus procedures appear to be similar⁽⁷⁾ while the risk of pelvic neuropathy is lower when the uterus is not removed because the pelvic anatomy is not disrupted⁽⁸⁾.

The surgical technique developed by Saba Nahedd is a uterus-preserving procedure which uses a suburethral and an isthmic sling to attach the uterine isthmus and the suburethral portion of the vagina, elevate and fix them to the medial and lateral parts of the rectus abdominis sheath. It is aimed for women with advanced uterine prolapsed, cystocele per magna and rectocele but it can also be applied for an isolated apical prolapsed grade I⁽⁹⁾. For this procedure, it has been developed a special set of instruments that contain two multifilament polypropylene strips, a suburethral and an isthmic one, as well as a special clamp to anchor the uterine isthmus and exteriorize the slings through two paraurethral tunnels.

In the present article, we used this surgical technique to correct symptomatic apical prolapses stages I-IV with or without cystocele per magna and rectocele of 103 women. We aimed to show the efficacy of this procedure by evaluating its success rate of reestablishing the normal pelvic anatomy as well as the subjective cure rate at one, three, six and twelve years postoperative.

Methods

The study has been conducted between 01.10.2013 and 01.01.2018 and has enrolled 103 patients with symptomatic apical prolapse stages I-IV according to the pelvic organ prolapsed quantitation system classification and/or cystocele per magna and/or rectocele. The symptoms at the moment of diagnosis included: PP, PPS, constipation and obstructed voiding (OV). A cervical

cytology and a fractional biopsy curettage have been preoperatively for each patient performed to exclude a cervical and endometrial neoplasia. In order to obtain as much as possible information with regard to their symptoms which may correlate with a defect of one or more compartments, we introduced a questionnaire that includes the above mentioned symptoms, three aspects that result after a clinical examination- the position (anterior, posterior, intermediary) and color (rose/other color) of the cervix as well as the presence or absence of a recurrence (Yes/No)- and the resumption of the sexual activity (Yes/No). The questions related to the patient's symptoms can be answered with "Yes" or "No" or "sometimes" (more than 50% impairment of the daily activity).

After establishing the diagnosis, each patient underwent the surgical technique developed by S.N. Both of the strips were multifilament polypropylene strips. The isthmic strip was "Y" shaped with 1.2 cm width. Two of "Y" arms of the isthmic strip were longer and have an attached unresorbable thread on each of the ends. The suburethral strip was 10 cm long, 1.2 cm width and also have an unresorbable thread at each of its ends. We used a special clamp to fix the strips and anchor the uterus isthmus. This has two orifices (i.e. superior and inferior) at the apex, two welded 2.5 cm long, slightly angulated arms and one ring attached at one of the two arms. The additional ring and the angulated arms help to form the two retropubic tunnels⁽⁹⁾.

The steps of the technique are⁽¹⁰⁾.

- **Step 1:** inverted "T" incision at 1.5 cm distance from the external cervical orifice until the urethral tubercle
- **Step 2:** Dissection of the urinary bladder from the anterior vaginal mucosa and of the urinary bladder from the cervix;
- **Step 3:** Formation of two retropubic tunnels;
- **Step 4:** Prolongation of the initial inverted "T" incision until the posterior face of the cervix and dissection of the posterior vaginal mucosa from the rect;
- **Step 5:** Pansation, sectioning and ligation of the cardinal ligaments at 1.5 cm distance from the cervix;
- **Step 6:** The long part of the isthmic strip is fixed at the lateral and posterior parts of the uterus isthmus.
- **Step 7:** The free, shorter part of the isthmic strip is attached at the anterior part of the uterus isthmus.
- **Step 8:** Suprapubic incision approximately 5 cm long
- **Step 9:** The ends of the suburethral strip are passed through the superior orifice of the clamp while the ends of the isthmic strip are passed through the inferior orifice; the threads of the strips are then passed through the two retropubic tunnels;
- **Step 10:** Anchoring and ligation of the suburethral threads at the lateral extremities of the rectus abdominis sheath. The procedure is done under urinary catheterization. Thus, the suburethral strip "replaces" the pubourethral ligaments.
- **Step 11:** Anterior colpectomy and colpoorrhaphy and suture of the cervical posterior incision;
- **Step 12:** Anchoring the threads of the longer part of the isthmic strip at the medial extremity of the rectus

abdominis sheath;The isthmic strip play now the role of the uterosacral ligaments.

■ **Step 13:** Tightening and ligation of the threads of the shorter isthmic arm;

■ **Step 14:** Suture of the suprapubic incision.

All the 103 have been examined on the 5th day post-operative, at one, three, six and twelve months using the same questionnaire of symptoms that we used at presentation. Results regarding a possible relief of symptoms after surgery as well as the presence or absence of a recurrence, the color and position of the cervix have been extracted from the questionnaires of symptom assessment.

We used descriptive statistics and the nonparametric McNemar test to examine the significance of a possible change in the evolution of symptoms. The McNemar test was applied to categorical dichotomous variables of nominal level that have two values- Yes(1)/No (0) for two independent samples.

Results

After analyzing the distribution of the symptoms, apical prolapse, cystocele and rectocele within the group we have applied the McNemar test to see if the technique brought a statistical significant improvement of the initial symptoms (Table 1 and Figure 1).

1. Distribution of the symptoms within the group

2. The distribution of the stage of apical prolapse within the group

About 100 of women (97.1%) of 103 had also cystocele per magna associated to the apical prolapse and 66 of 103 women (64.1%) were diagnosed with rectocele.

The S.N technique has been applied on 102 patients. One patient (99.02%) had total hysterectomy in antecedents and no fixation of the uterine isthmus has been performed.

3. Postoperative results

A favorable postoperative evolution in terms of no hematoma formation, no strip infection, removal of the urinary

Table 1 Distribution according symptoms at presentation

Symptoms	N (% of 103)
PP	65 (63.1%)
PPS	81 (78.6%)
Constipation	64 (62.1%)
OV	95 (92.1%)

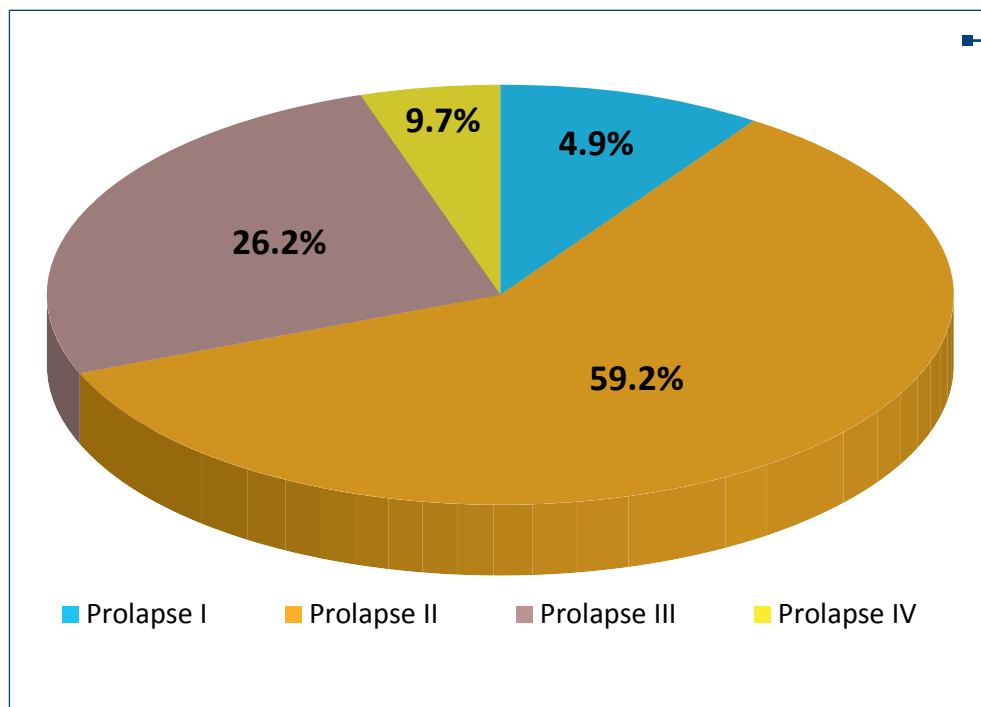


Figure 1. Distribution according to stage of apical prolapse

catheter on the 5th day postoperative and spontaneous voiding, no wound infection and urinary residual volume less than 50 ml has been noticed in 83 (80.6%) of patients.

The rest of 20 women (19.4%) of 103 had an unfavorable evolution: Of these, 19 women (95%) needed a reintroduction of the urinary catheter due to a urinary residual volume more than 100 ml. Other immediate complications were: abnormal non-intermediary position of the cervix has been observed in the postoperative clinical examination at 14 patients (70%), prolapse recurrence at 3 patients (15%), inflammation of the suburethral at 2 patients (15%), isthmus strip at 2 patients (15%) which were later removed (15%) and obstructed voiding at 15 patients (75%) (Table 2).

Each patient was examined at one, three, six and twelve months. A clinical examination has been performed to evaluate the position of the cervix, the presence or absence of a strip induration or a prolapse recurrence. From the questionnaire of symptom evaluation we have extracted data on PPs, PPS, constipation, OV and sexual function. We centralized our results in an Excel Database and we applied the McNemar test to see if we obtain a statistical significant change between the

symptoms (and diagnosis) at presentation and the postoperative period and namely one, three, six and twelve months. In this reported we presented the changes in PP, PPS, constipation, OV, cystocele and rectocele rates and sexual function.

4. Pelvic pain (PPs)

We obtained a statistical significant improve of the PPs at three, six and twelve months compared to the preoperative period. However, at one month postoperative, no significant improvement of the symptoms has been observed (Table 3).

5. Pelvic pressure sensation (PPS)

A statistical significant decrease in the number of women who reported PPS has been observed at one, three, six and twelve months (Table 4) compared to the initial moment.

6. Constipation

Similar to PPS, we obtained a significant decrease in the number of patients who presented with constipation as a result of the rectocele (Table 5).

7. Obstructed voiding

The surgery resulted in a significant improvement of the obstructed voiding symptoms such as: low stream,

Table 2 Immediate postoperative complications

Unfavorable evolution	20 (19.4%)
■ Urinary catheter	19 (95%)
■ abnormal position of the cervix	14 (70%)
■ recurrence	3 (15%)
■ strip inflammation	2 (15%) (suburethral) 2 (15%) (isthmus)
■ removal of the strips	2 (15%)
■ obstructed voiding	15 (75%)

Table 3 Significance of the change in PP intensity

Initial	Final	Initial proportion (p1)	Final proportion (p2)	Probability McNemar Test (p)	Differences
PPs	PPs (M1)	63.10%	49.50%	0.065	NO
PPs	PPs (M3)	63.10%	37.90%	<0.001	YES
PPs	PPs (M6)	63.10%	12.60%	<0.001	YES
PPs	PPs (M12)	63.10%	5.80%	<0.001	YES

Table 4 Significant decrease in the number of cases with PPS

Initial	Final	Initial proportion (p1)	Final proportion (p2)	McNemar Test probability (p)	Differences
PPS	PPS (M1)	78.60%	29.10%	<0.001	Yes
PPS	PPS(M3)	78.60%	20.40%	<0.001	Yes
PPS	PPS(M6)	78.60%	8.70%	<0.001	Yes
PPS	PPS(M12)	78.60%	5.80%	<0.001	Yes

Table 5 Significant changes in the proportion of patients who initially reported constipation

Initial	Final	Initial proportion (p1)	Final proportion (p2)	McNemar Test Probability (p)	Differences
Constipation	Constipation (M1)	62.10%	2.90%	<0.001	Yes
Constipation	Constipation (M3)	62.10%	2.90%	<0.001	Yes
Constipation	Constipation (M6)	62.10%	1.00%	<0.001	Yes
Constipation	Constipation(M12)	62.10%	1.00%	<0.001	Yes

Table 6 Significant changes in the prevalence of obstructed voiding

Initial	Final	Initial proportion (p1)	Final proportion (p2)	McNemar Test Probability (p)	Differences
OV	OV (M0)	92.20%	14.60%	<0.001	Yes
OV	OV(M1)	92.20%	17.50%	<0.001	Yes
OV	OV(M3)	92.20%	15.50%	<0.001	Yes
OV	OV (M6)	92.20%	10.70%	<0.001	Yes
OV	OV(M12)	92.20%	7.80%	<0.001	Yes

M0= at presentation

Table 7 Reestablishment of the normal position of the cervix after operation

Initial	Final	Initial proportion(p1)	Final proportion (p2)	McNemar Test Probability (p)	Differences
Cervix	Cervix (M1)	86.40%	99.00%	<0.001	Yes
Cervix	Cervix(M3)	86.40%	98.20%	0.016	Yes
Cervix	Cervix (M6)	86.40%	98.10%	0.002	Yes
Cervix	Cervix(M12)	86.40%	99.00%	<0.001	Yes

sensation of an incomplete bladder emptying or complete urinary retention (Table 6).

8. Position of the cervix

About 86.40% of patients had a non-intermediary cervix (i.e. due to the apical prolapse). This has been through the surgical intervention and persisted at one, three, six and twelve months (Table 7).

9. Recurrence

Postoperative the recurrence rate of the apical prolapse was 2.9% (only in 2 patients) probably due to the inflammation of the isthmus strip which needed to be removed. The improvement rates in cystocele and rectocele are represented in Table 8 and Table 9.

9.1 Cystocele

9.2 Rectocele

10. Sexual function

Only 0.97% reported to have a sexual life at one month. However, as the symptoms relieved, the proportion of women who resumed the sexual activity statistically significant increased (Table 10).

Discussion

The reconstructive technique developed by S.N is a uterus-preserving technique which uses two special strips to reestablish the normal anatomy of the apical, anterior and posterior compartment. The suburethral and isthmus strips take the role of the pubo-urethral and isthmus strip respectively over and allow the attachment of the uterine isthmus to the sheath of the rectus abdominis muscle, a structure whose composition

Table 8 Statistical significant improvement in the rates of cystocele at one, three, six and twelve months

Initial	Final	Initial proportion initial (p1)	Initial proportion (p2)	McNemar Test Probability (p)	Differences
Cystocele	Cystocele (M1)	97.10%	20.40%	<0.001	Yes
Cystocele	Cystocele(M3)	97.10%	19.40%	<0.001	Yes
Cystocele	Cystocele(M6)	97.10%	18.40%	<0.001	Yes
Cystocele	Cystocele (M12)	97.10%	23.30%	<0.001	Yes

Table 9 Rates of rectocele at one, three, six and twelve months

Initial	Final	Initial proportion (p1)	Final proportion (p2)	McNemar Test Probability (p)	Differences
Rectocele	Rectocele (M1)	64.10%	2.90%	<0.001	Yes
Rectocele	Rectocele (M3)	64.10%	2.90%	<0.001	Yes
Rectocele	Rectocele (M6)	64.10%	2.90%	<0.001	Yes
Rectocele	Rectocele (M12)	64.10%	1.9%	<0.001	Yes

Table 10 Significant improvement of the sexual activity

Initial	Final	Initial proportion (p1)	Final proportion (p2)	McNemar Test Probability (p)	Diff.
SF (M1)	SF (M3)	0.97%	14.56%	.001	Yes
SF (M1)	SF (M6)	0.97%	27.18%	< 0.001	Yes
SF (M1)	SF (M12)	0.97%	35.92%	< 0.001	Yes

SF= sexual function

is not influenced by the patient's hormonal status. The technique has been applied in 103 women with apical prolapse, cystocele per magna and rectocele and is associated with a recurrence rate of the apical prolapse of 2.9%^(10,11).

The subjective cure rate referred to the relief of the prolapse-associated symptoms such as PP, PPS, constipation and OV. The technique resulted in a statistical significant improvement of the symptoms during one year compared to the rates of initial symptoms at presentation. In order to evaluate the anatomic success rate we have evaluated the position of the cervix on the 5th day postoperatively, at one, three, six and twelve months as well as the improvement in the rates of cystocele per magna and rectocele. The cervix had a normal, intermediary position in 98.20-99% of cases. We have also obtained a statistical significant decrease in the rates of cystocele per magna and rectocele at one, three, six and twelve months compared to the preoperative period. However, our results are different from those published in other studies on the benefits of uterine-sparing procedures. These studies^(11,12) reported a shorter duration of the operation and less blood loss compared to vaginal hysterectomy at the moment of prolapse correction⁽¹¹⁾, however the recurrence rates associated to the hysterectomy were significantly higher⁽¹¹⁾.

Our technique had no significant impact on the sexual function with a significant increase in the rates of patients who reported a sexual life and namely until 35.92% at twelve months postoperative. The result

does also not correlate with the data⁽¹²⁾ who found no significant difference in the rates postoperative sexual function between women with hysterectomy vs. vaginal hysterectomy for uterine prolapse.

In our study only 20 patients (19.4%) had postoperative complications. The current available data did not demonstrate a significant improvement in the postoperative complications rates when using a uterine-preserving technique compared to other techniques. However, more data is required to conclude on the efficiency of uterine-sparing procedures.

Conclusions

The technique of attaching the uterine isthmus to the sheath of the rectus abdominis muscle is associated with a significant improvement in the prolapse-associated symptoms as well as a high anatomic success rate. Therefore, no impairment of the sexual activity has been noticed. However, larger studies are necessary to implement this technique in the routine clinical practice as its benefits compared to the techniques that imply a concomitant vaginal hysterectomy are still unclear. Moreover, it is essential to inform the patients about possible future recurrences as well as the remaining risk of cervical or endometrial neoplasia. A uterine-sparing procedure must be performed by surgeons with high experience in pelvic reconstructive surgery. ■

Conflict of interests: The authors declare no conflict of interests.

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