

## DOES ROUND LIGAMENT FIXATION IN ADDITION TO A SIMPLIFIED UTEROSACRAL LIGAMENT SUSPENSION OF THE VAGINAL VAULT IMPROVE THE FUNCTIONAL OUTCOME AFTER VAGINAL HYSTERECTOMY IN PATIENTS WITH PELVIC ORGAN PROLAPSE?

### Hypothesis / aims of study

Despite increase in popularity of uterus preserving techniques, vaginal hysterectomy is still a common option in the surgical treatment of uterine prolapse. However, in pelvic organ pro-lapse (POP) special attention has to be paid to a sufficient suspension of the vaginal vault in order to prevent recurrence of descent and to protect possibly additional repair of the vaginal walls. For decades, a wide experience of surgical practice has shown that even in complete prolapse the vaginal cuff will be retracted, sufficiently, after fixation of the vault to the various pedicles including the uterosacral and the round ligament (1). Among the multiple procedures described for vault suspension McCall culdoplasty is widely used as a vaginal entry. Further-more, the improvement in body image due to normal vaginal reconstitution has been proven to be significant on sexual behavior (2). The aim of the present pilot study was to relate the vault attachment after vaginal hysterectomy to POP-Q parameters and selected items of sexual function comparing a simplified uterosacral ligament suspension (ULS) with a com-bined technique consisting of ULS and additional round ligament suspension (RLS).

### Study design, materials and methods

In twenty-eight patients, aged between 40 and 78 years, suffering from an uterine prolapse POP-Q stage I (n = 5), II (n = 13) and III (n = 10) a vaginal hysterectomy was done combined with a bilateral uterosacral vault suspension. After performing vaginal hysterectomy the perito-neal cavity was entered by means of two long Breisky specula. Laterally in between, the uterosacral ligament was exposed and identified as a prominent peritoneal plication, clearly medial and posterior to the ischial spine. A simplified McCall procedure was performed using one absorbable 1-0 suture on each corner which incorporated the posterior vaginal wall, the margin of the cul-de-sac peritoneum, the remains of the uterosacral ligament 2 to 3 cm above the peritoneal margin, the posterior part of the broad ligament, the anterior peritoneal margin and the anterior vaginal wall. In seven patients, the center of the vaginal apex was attached to the round ligaments, additionally. Following closure of the peritoneal dehiscence between the McCall sutures the remnants of the round ligaments were exposed and banded together by means of two absorbable 1-0 sutures rising along the course of the ligaments. The ends of the upper suture were anchored in the anterior and posterior margin of the vaginal vault in the midline resulting in a three point fixation of the vaginal apex after all sutures have been tied. The functional postoperative outcome was assessed by a standardized questionnaire covering sexual behavior and discomfort. Data analysis was done using nonparametric tests and by linear regression.

### Results

Within the total group the distribution of POP-Q stages shifted significantly to lower stages after surgery (table 1). No ureteral obstruction was observed. In 4 patients reoperations were performed. In two cases a primary and a recurrent cystocele were corrected by conventional and mesh repair of the anterior wall, respectively. Additionally, sacrospinous ligament suspension was used just as in the one patient (3,6%) who presented with a recurrent prolapse of the vaginal apex (C +3 cm) 10 months after vault suspension by means of uterosacral and round ligament fixation. One further patient was provided by a midurethral sling (TOT) due to urinary stress incontinence 11 months after hysterectomy with concurrent anterior wall repair.

Table 1. Distribution of POP-Q stages in the total group

POP-Q (point C)	Before Surgery	After Surgery	p
Stage ≤ 1	5	27	< 0,001
Stage ≥ 2	23	1	

In the whole group, C was found to range between -3 cm to +5 cm before surgery and between -10 cm to +3 cm after surgery (p < 0,001). The mean inward shift of point C was  $-6,3 \pm 2,7$  cm. As a result of hysterectomy, mean tvl was decreased by approximately 1,5 cm from  $9,7 \pm 1,3$  cm, preoperatively, to  $8,2 \pm 1,8$  cm, postoperatively (n = 22, p < 0,005). No differences were detected in patients treated only by ULS compared to patients treated by ULS and additional RLS (table 2b).

Age, BMI and concurrent anterior and posterior wall repair did not differ between patients with solely ULS and patients with ULS and RLS, respectively. Mean follow up in the group of combined suspension was about half a year shorter compared to the ULS only group (table 2a).

Irrespective of being sexually active, available questionnaires after surgery (n = 22) did not prove any frustration concerning sexual life in half of all patients. 26% (6/23) of the patients reported to have no intercourse anymore. Loss of urine or pain during intercourse was indicated by 29% (5/17) and 24 % (4/17) of the patients, respectively. None of the patients noted sexual abstinence due to vaginal narrowing. No sexual item showed any difference between the two suspension groups (table 2c).

The frequency of intercourse decreased with increasing age ( $r = 0,45$ ,  $n = 23$ ,  $2\alpha < 0,05$ ) and increasing BMI ( $r = 0,52$ ,  $n = 22$ ,  $2\alpha < 0,05$ ) without dependence of BMI from age ( $r = 0,10$ ,  $n = 26$ ). No correlation was found between the postoperative values of C and tvl and the frequency of intercourse, respectively. However, in contrast to the preoperative analysis the increase of tvl was strongly related to diminishing values of C after surgery ( $r = 0,58$ ,  $n = 27$ ,  $2\alpha < 0,01$ ). Again, rising data of BMI were significantly associated with a growth of tvl ( $r = 0,59$ ,  $n = 26$ ,  $2\alpha < 0,01$ ).

Table 2. Comparison of vault suspension techniques

ULS only n = 21	ULS + RLS n = 7	p-values
--------------------	--------------------	----------

a. Demographic data of patients

	ULS only n = 21	ULS + RLS n = 7	p-values
Age (years)	57 ± 11	56 ± 10	0,917
BMI (kg/m <sup>2</sup> )	25,6 ± 4,2	26,1 ± 4,2	0,692
Concurrent anterior wall repair (%)	71 (15/21)	71 (5/7)	1,0
Concurrent posterior wall repair (%)	38 (8/21)	0 (0/7)	< 0,2
Follow up (months)	20,4 ± 9,3	13,3 ± 5,1	0,036

b. POP-Q data

	ULS only n = 21	ULS + RLS n = 7	p-values
tvl before surgery (cm)	9,6 ± 1,3	9,9 ± 1,4	0,609
tvl after surgery (cm)	8,4 ± 1,7*	7,9 ± 1,8*	0,766
C before surgery (cm)	0,6 ± 2,0	0,9 ± 1,5	0,604
C after surgery (cm)	-6,1 ± 1,6*	-4,4 ± 3,6*	0,272
C shift (cm)	-6,7 ± 2,6	-5,4 ± 3,1	0,604

\* p < 0,05 concerning the values after surgery compared to the values before surgery

c. Data of sexual domain

	ULS only n = 21	ULS + RLS n = 7	p-values
No frustration concerning sexual life (%)	59 (10/17)	40 (2/5)	0,624
Frequency of intercourse < 1x/month (%)	39 (7/18)	40 (2/5)	1,0
Loss of urine during intercourse (%)	15 (2/13)	25 (1/4)	1,0
Dyspareunia (%)	15 (2/13)	50 (2/4)	0,219
No intercourse due to narrow vagina (%)	0 (0/13)	0 (0/4)	no value

Interpretation of results

Normally, ULS is performed using two or three sutures on each side. In contrast, the total suspension procedure is simplified by restriction to only one suture per side, thus additionally reducing the risk of ureteral compromising. The rate of a successful outcome (POP-Q stage 0 or 1) for the apical compartment in the present study (96%) accords with the range (98%) in a recent large meta-analysis (3). Referring to the sexual function and the correction of POP-Q parameters no added benefit was delivered by additional fixation of the vaginal apex to the round ligaments. Apparently, due to the content of connective tissue the strength of utero-sacral ligament is superior to the round ligament. The correlation between C and tvl as a result of the surgical procedure seems to reflect a restitution of an appropriate vault suspension. Moderate shortening of the vaginal length after surgery may be due to the removal of the uterus, whereas the gain of tvl with increasing values of BMI might globally indicate a larger body. The overall rate of postoperative dyspareunia corresponds to the common range (25%). However, within the limits of POP-Q stage 0 and 1 the level of correction after surgery is not involved in sexual function. Increasing age is a well-known reason of declining sexual activity. In addition, the significance of body image concerning postoperative sexual function might be assessed by the level of BMI rather than by quantitative parameters of vaginal restoration.

### Concluding message

After vaginal hysterectomy the vaginal vault can be sufficiently suspended by a simplified uterosacral fixation technique using only one suture on each corner. Additional attachment of the mid cuff to the round ligaments does not provide any supplementary benefit. The level of POP repair has no impact on sexual activity apart from the shift toward lower POP-Q stages. Sexual function is preferably associated with age and BMI.

### References

1. 1. Tunn R, Riss P, Schär G. Operative Therapie des Descensus. In: Urogynäkologie in Praxis und Klinik (R Tunn, E Hanzal, D Perucchini, eds.) Walter de Gruyter Berlin New York (2010): 245-262
2. 2. Roos AM, Thakar R, Sultan AH, de Leeuw JW, Paulus ATG. The impact of pelvic floor surgery on female sexual function: A mixed quantitative and qualitative study. *British Journal of Obstetrics and Gynecology* (2014), 121: 92-101
3. 3. Margulies RU, Rogers MA, Morgan DM. Outcomes of transvaginal uterosacral ligament suspension: systematic review and metaanalysis. *American Journal of Obstetrics and Gynecology* (2010), 202 (2):124-134

### Disclosures

**Funding:** NONE **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics not Req'd:** In the Netherlands, for retrospective chart review, no ethical review board approval is required. **Helsinki:** Yes **Informed Consent:** Yes