



## ARAŞTIRMA / RESEARCH

# Comparison of anterior colporrhaphy and repair with mesh for anterior vaginal wall prolapse

Anterior vaginal duvar prolapsusunda meş cerrahisi ve ön onarım sonuçlarının karşılaştırılması

Gökmen Sukgen<sup>1</sup>, Aşkı Ellibeş Kaya<sup>2</sup>

<sup>1</sup>Adana Metro Hospital Department of Obstetrics and Gynecology, Adana, Turkey

<sup>2</sup>Düzce University Faculty of Medicine Department of Obstetrics and Gynecology, Düzce, Turkey

*Cukurova Medical Journal 2018;43(Suppl 1):248-253*

### Abstract

**Purpose:** The aim of this study was to compare anterior colporrhaphy versus mesh repair as surgical management of anterior vaginal prolapse at the 12-months follow-up.

**Materials and Methods:** This retrospective study was performed on 69 patients who were diagnosed with symptomatic anterior vaginal compartment defect (Grade II or higher) according to the Pelvic Organ Prolapse Quantification (POP-Q) system. Thirty-six of these patients underwent conventional colporrhaphy anterior (Group 1), thirty-three patients (Group 2) were treated with anterior repair via mesh application. Operation type and duration, patient satisfaction and objective and subjective cure rates, postoperative pain score using visual analog scale (VAS) scores were recorded at 6-months and 12-months.

**Results:** Patient satisfaction was significantly higher in Group 2. Objective cure rates at 12-months after surgery were found 87.8% in Group 2 and 61.1% in Group 1; the difference was statistically significant. Subjective cure rates were determined as 90.9% in group 2 and 69.4% in Group 1. The duration of operation was confirmed to be significantly longer in the mesh group than Group 1. No significant differences were found between one day after and one year after surgery, in comparisons of our groups regarding VAS score for pelvic pain.

**Conclusion:** The anterior repair with mesh procedure seems to be advantageous due to the higher objective cure rate and patient satisfaction for the treatment of anterior compartment defects.

**Key words:** Pelvic organ prolapse, mesh, mesh repair, anterior colporrhaphy, anterior vaginal wall.

### Öz

**Amaç:** Bu çalışmanın amacı anterior vaginal duvar prolapsusunda klasik ön onarım ile meş cerrahisi onarımın 12 aylık takip sonuçlarını karşılaştırmaktır.

**Gereç ve Yöntem:** Bu retrospektif çalışma; Pelvik Organ Prolapsusu Sınıflandırma Sistemi'ne (POP-Q) göre Grade II veya üzerinde anterior vaginal kompartman defekti olan 69 semptomatik hasta ile yapıldı. Otuz-altı hastaya klasik ön onarım uygulandı (Grup 1), otuz-üç hastaya meş cerrahisi ile ön kompartman onarımı yapıldı (Grup 2). Operasyon şekli, süresi, 6. ve 12. aylarda hasta memnuniyetleri, objektif ve subjektif kür oranları, operasyon sonrası ağrı skorları görsel analog skala (VAS) kullanılarak kaydedildi.

**Bulgular:** Hasta memnuniyeti Grup 2'de istatistiksel olarak anlamlı oranda fazlaydı. Cerrahi sonrası 12.aydaki objektif kür oranları Grup 2'de %87.8 ve Grup 1'de %61.1 bulundu. Fark istatistiksel olarak anlamlıydı. 12.aydaki subjektif kür oranları Grup 2'de %90.9 ve Grup 1'de %69.4 bulundu. Operasyon süresinin Grup 1'de istatistiksel olarak anlamlı oranda uzun olduğu saptandı. Gruplar arası ameliyatın ilk günü ve birinci yılı VAS ağrı skorlarında fark izlenmedi.

**Sonuç:** Meş cerrahisi ile ön kompartman onarımı yüksek objektif kür oranları ve yüksek hasta memnuniyeti nedeniyle avantajlı görünmektedir.

**Anahtar kelimeler:** Pelvik organ prolapsusu, meş, meş onarımı, ön onarım, ön vaginal duvar

## INTRODUCTION

Pelvic organ prolapse (POP), also referred to as urogenital prolapse, is defined as the anterior and inferior displacement of pelvic organs due to pelvic floor dysfunction<sup>1</sup>. POP is a common condition with prevalence rates of 25–65%<sup>2</sup>. It is an important cause of morbidity among females in both high and low-income countries<sup>3</sup>.

The risk of undergoing surgery for POP throughout the lifetime of a woman is close to 11%<sup>4</sup>. Prolapse of the anterior vaginal wall (cystocele) is the most common and typical segment requiring surgical repair. Anterior colporrhaphy which contains central plication of the fibromuscular layer of the anterior vaginal wall, is the most commonly used surgery for cystocele repair<sup>5</sup>. During this repair, weak tissues are strengthened by the relocation of lateral tissues to the midline via plication and the bladder is brought to its normal position. However, studies have reported high percentages of recurrence (30-70%) with conventional anterior colporrhaphy surgery<sup>4,5</sup>. Due to high recurrence of reconstruction with natural tissue, mesh surgery has begun to be performed to provide better support. Many studies have confirmed that mesh reinforcement significantly reduced anatomic recurrences of anterior vaginal prolapse<sup>6-8</sup>. However, currently available data suggest that mesh reinforcement brings forth various risks as well as advantages for vaginal prolapse surgery. Although several randomized controlled trials reported lower recurrence rates with mesh reinforcement compared to conventional surgery, they also found that mesh-related complications occurred<sup>6,7,9-10</sup>.

Our aim in the current study was to compare operation type and time, patient satisfaction and objective and subjective cure rates of anterior colporrhaphy versus mesh repair as surgical management of anterior vaginal prolapse at 12-months follow-up.

## MATERIALS AND METHODS

This retrospective study was performed on 69 patients in the gynecologic department of a private hospital from March 2013 to August 2017 with patients who were operated on for cystocele. The local ethical committee approved the study protocol (2018-146). Informed consent was obtained from all

participants, and the study was in agreement with the Declaration of Helsinki for Medical Research Involving Human Subjects. Inclusion criteria were: cystocele grade II or more according to the POP-Q system. Exclusion criteria were: pregnant women, patients with incontinence; patients with previous Burch colposuspension or sacrocolpopexy, patients with hysterectomy. The grading of pelvic organ prolapse was performed according to the POP-Q grading system.

Demographic features and medical history included age, body mass index (BMI), menopausal state, parity, and previous gynecological surgeries. Patients were evaluated and re-examined during 24 hours, six months, and one year after surgery. Surgical outcome was defined as satisfactory when points Aa, Ba, Ap, and Bb were at stage 1 and 0 or unsatisfactory when these were at stage 2 or worse. Objective cure was considered when satisfactory anatomical scores were recorded by the end of the follow-up period and if not it was considered as a failure.

All history taking, pelvic examinations, POP-Q grading, and surgeries were performed by the same physician. Patients were informed about both surgeries according to the literature and were notified that one of either surgery was to be performed. Thirty-six patients underwent conventional colporrhaphy anterior (group 1), while 33 patients underwent anterior repair with mesh surgery (group 2). The patients evaluated their overall satisfaction with the surgery using a three-item Likert scale (3: very satisfied; 2: satisfied; 1: not satisfied) from preoperative status. Postoperative pain score using visual analog scale (VAS) scores were recorded at one day and one year after the surgery.

### Anterior repair with four-armed mesh procedure

Patients were placed in dorsal lithotomy position under spinal anesthesia, and 16 Fr urethral catheter was inserted. The procedure was a slightly modified version of the four-armed mesh procedure with the standard kit. At the level of the clitoris, a 1 cm bilateral incision was made in the inguinal sulcus to determine the areas where the upper arms of the mesh will be removed. A midline full thickness incision was performed on the anterior vagina extending up to 2 or 3 cm from the urethral meatus.

The bladder was dissected away from the vaginal wall. The tunnel formed in the paraurethral distance was palpated with the index finger to palpate the ischiopubic ramus posterior and internal obturator muscle. While the index finger was palpating the internal obturator limb, the inguinal cleft at the previous clitoral site was inserted with the TOT (trans-obturator tape) needle, and the palpable finger was reached by passing through the obturator foramen. The needle was passed through the tunnel with the finger to reach the suburethral area. The needle attached to the mesh was turned back in the direction of entry, and the arms of the mesh were removed from the skin. The process was done in the same way on the other side. By a vertical incision made in the anterior vaginal wall, the paravesical gap was reached. The other two skin incisions were done 2 cm lateral and 3 cm inferior to the previous incisions for lower arms of the mesh. Then the procedure was repeated using the lower arms of the mesh as was performed with upper arms. The needle passed through the inferior obturator foramen then the four arms of the mesh were used to adjust it in tension-free method to cover the prolapsed area. The arms of the mesh on the skin were cut in the direction of the skin and the incisions are sutured. Thus, the angle of the vaginal anterior wall was approximately 30-45 degrees in a patient in a horizontal position, with the vaginal depth reaching approximately 8-10 cm.

The type and duration of the surgery, intraoperative and postoperative complications and patient satisfaction were recorded. Follow-up studies were

scheduled and performed at post-op one day and one year after.

### Statistical analysis

The SPSS v12 computer software for Windows was used for all analyses. Continuous variables were given as mean  $\pm$  SD, and categorical variables were given as frequency and percentage. The independent t-test was used to compare continuous variables, while the Chi-square test was used to compare differences among categorical variables. Pre- and post-op differences between parameters were analyzed with the paired t-test. A p-value is lesser than 0.05 was accepted to show statistical significance.

## RESULTS

The study group was comprised of 69 patients of which 36 underwent conventional colporrhaphy anterior surgery (group 1), while the remaining 33 underwent anterior repair with mesh surgery (group 2). The characteristics of the participants are shown in table 1. Mean ages were  $48.05 \pm 14.18$  in group 1 and  $47.03 \pm 15.60$  (mean  $\pm$  SD) in the group 2 ( $p=0.777$ ).

Mean BMI values were  $26.18 \pm 2.47$  kg/m<sup>2</sup> in group 1 and  $26.01 \pm 3.31$  kg/m<sup>2</sup> (mean  $\pm$  SD) in the mesh group ( $p=0.859$ ). The groups were similar regarding age and BMI. There were also no significant differences between groups regarding demographic characteristics and descriptive data (Table 1).

**Table 1. Demographic and descriptive data of the study group**

	Group 1. n=36. (%)	Group 2. n=33. (%)	p value
Age (mean $\pm$ SD)	48.05 $\pm$ 14.18	47.03 $\pm$ 15.60	0.777
BMI (mean $\pm$ SD)	26.18 $\pm$ 2.47	26.01 $\pm$ 3.31	0.859
Parity (mean $\pm$ SD)	4.90 $\pm$ 2.40	4.94 $\pm$ 2.64	0.079
Difficult labor	25 (69.4%)	20 (60.6%)	0.441
Menopause	17 (47.2%)	12 (36.3%)	0.253
Smoking	9 (25%)	8 (24.2%)	0.941
Operation time (mean $\pm$ SD)	25.14 $\pm$ 2.78	40.54 $\pm$ 7.54	0.001

BMI: Body Mass Index

All patients had isolated cystocele. Regarding cystocele grades, Group 1 was comprised of 4 (11.1%) grade 4, 13 (36.1%) grade 3 and 19 (52.7%) grade 2 patients. In Group 2, 3 (9.09%) had grade 4, 12 patients (36.3%) had grade 3 and 18 patients (54.5%) had grade 2 cystocele. The distribution of groups was similar according to cystocele grades. Operation time was found to be significantly longer

in the mesh group compared to group 1. (minutes; mean $\pm$ SD; 25,14  $\pm$  2.78 vs. 40,54  $\pm$  7,54;  $p=0.001$ ). There were no complications of rectum, nerve, bladder, bowel, ureter injury seen among groups. Procedures were defined as objective cure if post-op cystocele grade was  $\leq 1$  according to POP-Q. Regarding this definition, 66.6%, 61.1% ( $n=24$ ,  $n=22$ ) of the procedures in the group 1 and 93.3%,

87.8% (n=31, n=29) of procedures in the group 2 were successful at six months and one year after surgery, respectively ( $p=0.032$ ,  $p=0.011$ ; Table 2). According to the complaints of patients' bloating and prolapse; subjective cure rates were defined as 66.6%, 69.4% (n=24, n=25) in the group 1 and

90.9%, 90.9% (n=30, n=30) in the group 2; at six months and one year after surgery, respectively ( $p=0.090$ ,  $p=0.127$ ; Table 2). Four patients in Group 1 applied because of the complete return of the same complaints as bloating and prolapse during postoperative one year.

**Table 2. Objective - subjective cure rates, satisfaction and pain scores of the groups**

	Group 1, n=36, (%)	Group 2, n=33, (%)	p value
Objective cure*			
6-months	24 (66.6%)	31 (93.3%)	0.032
12-months	22 (61.1%)	29 (87.8%)	0.011
Subjective cure			
6-months	24 (66.6%)	30 (90.9%)	0.090
12-months	25 (69.4%)	30 (90.9%)	0.127
Satisfaction <sup>§</sup>			
very satisfied	12(33.3%) <sup>a</sup>	20(60.6%) <sup>b</sup>	0.001
satisfied	13(36.1%) <sup>a</sup>	10(30.3%) <sup>a</sup>	
not satisfied	11(30.5%) <sup>a</sup>	3(9.09%) <sup>b</sup>	
Pain (VAS)			
Postoperative 24.hours	4.10±0.19	3.87±1.82	0.453
12-months	1.1±0.14	1.3±0.17	0.356

\* Objective cure was evaluated as Postoperative cystocele grade  $\leq 1$ ; <sup>§</sup> Satisfaction was evaluated at 12. Months.

Each subscript letter denotes a subset of categories whose column proportions do not differ significantly from each other at the 0.05 level.; The significance level is  $p \leq 0.05$ .

It was seen that the groups were statistically different regarding patient satisfaction. The rate of patients who were very satisfied was higher in group 2 ( $p=0.001$ ). There were no significant differences between groups regarding postoperative pain at postoperative 24.hours and one year after the surgery ( $p=0.453$ ,  $p=0.356$ ; respectively).

## DISCUSSION

In present trial, the one year after surgery of anterior vaginal wall prolapse treatment with the colporrhaphy anterior and the anterior repair with mesh were compared regarding the POP-Q classification. The retrospective features of the study and the small number of participants are limitations of the study. Although there is data about no difference in objective cure rates between mesh surgery and conventional method<sup>5</sup>; There are a large number of publications that show that mesh surgery is more effective on varying anatomic cure rates for anterior vaginal wall prolapse treatment between 79%–95% with mesh and 30%–60% with colporrhaphy<sup>11-12</sup>.

It was found that a success rate of 81% with mesh and 65.6% without mesh in a study<sup>13</sup>. Another study

reported the objective cure rate of mesh procedures as 93% with 3-year followup<sup>12</sup>. Subjectively only two of 77 patients have had recurrent symptoms of prolapse, and only one of these has required repeat surgery for cystocele. In a randomized study comprised of 218 patients, it was reported that an elevated rate of anatomic correction was 75.7% with follow-up 38 months<sup>14</sup>. A recent study has reported an anatomical cure rate of 87.5% with transvaginal mesh<sup>15</sup>.

Our findings with colporrhaphy anterior and mesh surgery are in agreement with the above-mentioned rates. In the present study, the objective cure rate was 87.8% at 12-months follow-up, and subjective cure rate was 90% in the mesh group. According to our results, more objective and subjective cure rates were determined with mesh surgery. The difference between objective cure rates was found significant. This data is consistent with the data in the literature. In another study, it was found that a high level of satisfaction with surgery and improvements in symptoms and quality-of-life data were observed at 12-months compared to baseline in both groups, but there was no significant difference in these outcomes between the groups with or without mesh<sup>13</sup>.

In the present study, regarding patient satisfaction, patients in the mesh group were found to have significantly higher satisfaction. The use of custom mesh materials rather than readily available kits in the current study is also worthy of note. This approach provides two important advantages; the ability to customize the size of the mesh according to patient requirement and lower cost. Another advantage was provided by the procedural modification that we performed in our patients. It was not performed mesh fixation. Additionally, because the customized mesh covers the whole of the cystocele, it is possible to keep traction on the posterior arms until correct positioning of the anterior vaginal wall is achieved; therefore, the tension of the mesh can be meticulously adjusted. Two important but small details are the use of the posterior arms with traction and the fact that the mesh is not fixated. Although our patient count is low, the 90% subjective and objective cure rate may be attributed to these modifications.

Mesh erosion depends on many factors like; patients age, immunity, estrogen deficiency, operative technique, concomitant illness<sup>16</sup>. Although 5-19% mesh erosion is shown in the literature<sup>6,8</sup>; in our study, it was not detected mesh erosion in any of the patients. While this may be due to limited follow-up time and it may also be explained by correct patient and mesh selection, appropriate mesh placement, effective hemostasis, correct antibiotherapy, and meticulous adherence to sterility. Furthermore, a recent study has shown that POP surgery requires significant specialty and experience, which may have also been an important factor which prevented mesh erosion<sup>17</sup>.

Although there is data regarding no differences between the two techniques in operation time<sup>11</sup>; in the present study, the duration of surgery was found to be longer than that of Group 1. This is a natural result and is caused by the dissection during the placement of the mesh<sup>18</sup>.

Complication rates in mesh surgery for anterior compartment defects were shown around five percent<sup>19</sup>. It was seen that no complications were observed in both groups in our study but 4 patients applied the same compliants before the surgery in Group 1. The lack of other complications was attributed to the small sample size and the short duration of follow-up. No significant differences were found between the pre and postoperative comparisons of our groups in terms of VAS score

for pelvic pain. The findings of our study demonstrate that anterior repair with mesh is a safe and effective surgery which has high cure rates.

In the present study, the one-year anatomic cure rate after polypropylene mesh reinforced anterior vaginal prolapse repair was significantly higher than anterior colporrhaphy. Mesh procedure seems to be advantageous due to the greater objective cure rate, higher patient satisfaction for the treatment of anterior compartment defects.

## REFERENCES

1. Doace M, Moradi-Lakeh M, Nourmohammadi A, Razavi-Ratki SK, Nojomi M. Management of pelvic organ prolapse and quality of life: a systematic review and meta-analysis. *Int Urogynecol J*. 2014;25:153-63.
2. Swift S, Woodman P, O'Boyle A, Kahn M, Valley M, Bland D et al. Pelvic Organ Support Study (POSS): The distribution, clinical definition, and epidemiologic condition of pelvic organ support defects. *Am J Obstet Gynecol*. 2005;192:795-806.
3. Gunasekera P, Sazaki J, Walker G. Pelvic organ prolapse: don't forget developing countries. *Lancet*. 2007;369:1789-90.
4. Olsen AL, Smith VJ, Bergstrom JO, Colling JC, Clark AL. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. *Obstet Gynecol*. 1997;89:501-6.
5. Weber AM, Walters MD, Piedmonte MR, Ballard LA. Anterior colporrhaphy: A randomized trial of three surgical techniques. *Am J Obstet Gynecol*. 2001;185:1299-306.
6. Nieminen K, Hiltunen R, Takala T, Heiskanen E, Merikari M, Niemi K et al. Outcomes after anterior vaginal wall repair with mesh: A randomized, controlled trial with a 3 year follow-up. *Am J Obstet Gynecol*. 2010;203:235.e1-8.
7. Altman D, Väyrynen T, Engh ME, Axelsen S, Falconer C. Anterior colporrhaphy versus transvaginal mesh for pelvic-organ prolapse. *N Engl J Med*. 2011;364:1826-36.
8. El-Nazer MA, Gomaa IA, Ismail Madkour WA, Swidan KH, El-Etriby MA. Anterior colporrhaphy versus repair with mesh for anterior vaginal wall prolapse: a comparative clinical study. *Arch Gynecol Obstet*. 2012;286:965-72.
9. Withagen MI, Milani AL, den Boon J, Vervest HA, Vierhout ME. Trocar-guided mesh compared with conventional vaginal repair in recurrent prolapse: A randomized controlled trial. *Obstet Gynecol*. 2011;117:242-50.
10. Sivaslioglu AA, Unlubilgin E, Dolen I. A randomized comparison of polypropylene mesh surgery with site-specific surgery in the treatment of cystocele. *Int Urogynecol J Pelvic Floor Dysfunct*. 2008;19:467-71.

11. Nguyen JN; Burchette RJ. Outcome after anterior vaginal prolapse repair: a randomized controlled trial. *Obstet Gynecol.* 2008;111:891–8.
12. Moore RD, Miklos JR. Vaginal repair of cystocele with anterior wall mesh via transobturator route: Efficacy and complications with up to 3-year followup. *Adv Urol.* 2009;2009:743831.
13. Carey M, Higgs P, Goh J, Lim J, Leong A, Krause H, et al. Vaginal repair with mesh versus colporrhaphy for prolapse: a randomised controlled trial. *BJOG.* 2009;116:1380–6.
14. Cervigni M, Natale F, Penna C, Panci M, Mako A. Transvaginal cystocele repair with polypropylene mesh using a tension-free technique. *Int Urogynecol J Pelvic Floor Dysfunct.* 2008;19:489–96.
15. Natale F, Costantini E, La Penna C, Illiano E, Balsamo R, Carbone A et al. Trocar-guided transvaginal mesh surgery for pelvic organ prolapse: effects on urinary continence and anatomical and functional outcomes. A prospective observational study. *Eur J Obstet Gynecol Reprod Biol.* 2017;210:29–34.
16. Collinet P, Belot F, Debodinance P, Ha Duc E, Lucot JP, Cosson M. Transvaginal mesh technique for pelvic organ prolapse repair: Mesh exposure management and risk factors. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006;17:315–320.
17. Van der Aa F, De Ridder D. Vaginal pelvic organ prolapse repair using mesh: let's welcome science into the mesh debate. *Eur Urol.* 2018;74:177-8.
18. Delroy C a., De A. Castro R, Dias MM, Feldner PC, Bortolini MAT, Girão MJBC et al. The use of transvaginal synthetic mesh for anterior vaginal wall prolapse repair: A randomized controlled trial. *Int Urogynecol J Pelvic Floor Dysfunct.* 2013;24:1899–907.
19. Eboue C, Marcus-Braun N, Von Theobald P. Cystocele repair by transobturator four arms mesh: Monocentric experience of first 123 patients. *Int Urogynecol J.* 2010;21:85–93.