

Pubourethral ligament reconstruction for stress urinary incontinence: A case series

Stres üriner inkontinans tedavisinde puboüretal ligaman cerrahisi: Bir vaka serisi

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ABSTRACT

Stress urinary incontinence (SUI) is characterized by involuntary urine leakage during physical activities and is commonly treated with midurethral slings (MUS). However, complications associated with MUS have led to the exploration of alternative surgical techniques. This retrospective study included 11 patients who underwent pubourethral ligament (PUL) plication without mesh for SUI between January 1 and September 1, 2024. Data on age, parity, menopausal status, and body mass index (BMI) were analyzed. The surgical technique involved a paraurethral incision approximately 2 cm below the urethra, with No. 2 polyester sutures placed at the medial and lateral portions of the PUL. Patients were evaluated using the cough stress test before discharge and on postoperative days 7 and 30. The mean age was 47.8 ± 8.13 years, and the mean BMI was 30.2 kg/m^2 . Menopausal distribution included reproductive ($n=2$), perimenopausal ($n=6$), and postmenopausal ($n=3$) patients. At all follow-up points, 10 out of 11 patients (90.9%) showed complete resolution of SUI symptoms. No intraoperative or major postoperative complications were reported. In conclusion, mesh-free PUL plication demonstrated high short-term efficacy in SUI treatment. Further randomized controlled trials are needed to assess long-term outcomes and compare this approach with other surgical techniques.

Keywords: pubourethral ligament, polyester repair of pubourethral ligament, stress urinary incontinence surgery

Not: Çalışma, 8 – 10 Kasım 2024 tarihlerinde İstanbul'da gerçekleşen 11. Ulusal Ürojenekoloji Kongresi'nde S-28 koduyla "Stres Üriner İnkontinans Tedavisinde Puboüretal Ligaman Cerrahisi: Bir Vaka Serisi" başlığı ile sözlü bildiri olarak sunuldu.

Öz

Stres üriner inkontinans (SÜİ), fiziksel aktiviteler sırasında istemsiz idrar kaçırmaya ile karakterizedir ve genellikle midüretal slingler (MUS) ile tedavi edilir. Ancak, MUS ile ilişkili komplikasyonlar, alternatif cerrahi yöntemlerin araştırılmasına yol açmıştır. Bu retrospektif çalışma, 1 Ocak - 1 Eylül 2024 tarihleri arasında SÜİ nedeniyle mesh kullanılmadan pubourethral ligament (PUL) plikasyonu uygulanan 11 hastayı içermektedir. Çalışmada yaş, parite, menopoz durumu ve vücut kitle indeksi (VKİ) gibi veriler incelendi. Cerrahi teknik olarak, üretranın yaklaşık 2 cm altındaki paraüretal alanda insizyon yapılarak No. 2 polyester sutureler, PUL'ün medial ve lateral kısımlarına yerleştirildi. Hastalar, taburcu öncesi ve postoperatif 7. ve 30. günlerde öksürük stres testi kullanılarak SÜİ semptomları açısından değerlendirildi. Hastaların ortalama yaşı $47,8 \pm 8,13$ yıl, ortalama ağırlığı $78,5 \pm 18,7$ kg ve ortalama VKİ'si $30,2 \text{ kg/m}^2$ idi. Menopoz durumuna göre dağılım: üreme döneminde ($n=2$), perimenopozal ($n=6$) ve postmenopozal ($n=3$). Tüm takip noktalarında, 11 vakanın 10'unda (%90,9) SÜİ semptomları tamamen düzeldi ve öksürük testleri sırasında idrar kaçağı gözlenmedi. Hiçbir hastada intraoperatif veya majör postoperatif komplikasyon bildirilmedi. Kısa dönem takip sonuçlarına göre, mesh kullanılmayan PUL plikasyonu, SÜİ tedavisinde oldukça etkili bulunmuştur.

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Application date: 27.01.2025

Accepted: 13.04.2025

Bu tekniğin uzun vadeli etkinliğini, potansiyel komplikasyonlarını ve diğer cerrahi yöntemlerle karşılaştırılmasını değerlendirmek için daha fazla randomize kontrollü çalışmaya ihtiyaç vardır.

Anahtar Kelimeler: Puboüretal ligaman, puboüretal ligaman polyester onarımı, stres üriner inkontinans cerrahisi

INTRODUCTION

Stress urinary incontinence (SUI), defined by the International Urogynecological Association (IUGA) as involuntary urine leakage during physical exertion, is commonly treated with midurethral slings (MUS), which are considered the gold standard surgical approach (1). However, complications associated with MUS procedures have prompted the development of alternative surgical techniques. In this context, beyond the traditionally favored midurethral slings, the literature has introduced pubourethral ligament (PUL) plication as a novel surgical method (2).

In the PUL plication technique described by Petros et al., two parallel incisions are made in each paraurethral sulcus, extending from the bladder neck to the pubic bone. The incisions are opened laterally to expose the medial and lateral branches of the PUL, as well as the external urethral ligament in each sulcus (Figure-1). These structures are then sutured together using No. 2 polyester sutures (2). This study aims to investigate the efficacy of mesh-free PUL plication in the treatment of SUI.

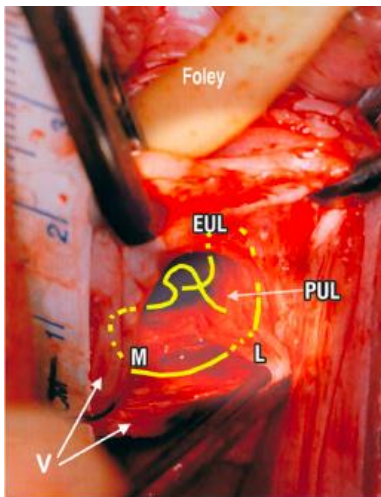


Figure-1. Incision in the right paraurethral area. EUL: External urethral ligament. PUL: Pubourethral ligament. M: Medial branch. L: Lateral branch. Copyright Peter Petros published by permission.

CASE REPORT

This retrospective case series reports the clinical observations of 11 patients who underwent PUL plication for SUI between January 1, 2024, and September 1, 2024. The Q-tip test and Marshall-Bonney test were utilized to guide surgical decision-making. Patient characteristics, including age, parity, menopausal status, body weight/height measurements, and the presence of intraoperative and postoperative complications, were retrospectively reviewed and recorded. The surgical procedure involved a 2 cm incision made approximately 2 cm below the urethra in the paraurethral area. Circular No. 2 polyester sutures were placed on the medial and lateral portions of the PUL and the external urethral ligament. These steps were performed separately for each paraurethral area. The vaginal mucosa was closed using polyglactin sutures. Patients were evaluated for stress urinary incontinence symptoms during examinations conducted before discharge and on the 7th and 30th postoperative days. Cough stress tests were performed at these follow-ups. The absence of stress urinary incontinence symptoms on postoperative days 7 and 30 was considered the criterion for surgical success. The mean and standard deviation values of the demographic data of the cases were as follows: mean age was 47.8 ± 8.13 years, and mean weight was 78.5 ± 18.7 kg. The average body mass index (BMI) was 30.2 kg/m^2 . According to menopausal status, the patients were classified as reproductive (n=2), perimenopausal (n=6), and postmenopausal (n=3). In the examinations conducted before discharge and on postoperative days 7 and 30, stress urinary incontinence symptoms had completely resolved in 10 out of 11 cases (90.9%). In the same group, no urinary leakage was observed during pelvic examinations performed with a cough test at these time points. No intraoperative or major postoperative complications were encountered in any of the patients.

DISCUSSION

According to the *Integral Theory*, at rest, the PCM pulls the PUL forward, resulting in urethral closure. During physical activity, functional pathologies can lead to SUI. The goal in managing SUI is to prevent the elongation of a lax PUL during such activities (3). The MUS procedure has been effective in treating SUI; however, it has become one of the most litigated operations in surgical history due to complications associated with the implanted mesh. The MUS relies on the wound healing response to the implanted tape to generate new collagen, thereby strengthening ligaments deficient in collagen. Alternatively, the use of non-absorbable sutures, such as wide-bore polyester sutures, has been proposed to reinforce weakened PUL by promoting new collagen formation, potentially preventing PUL elongation during physical activity (2,4).

Petros et al. observed that, prior to discharge, 30 out of 31 patients who underwent PUL plication exhibited negative results on the cough test (2). Similarly, Sivaslıoğlu et al. reported an 86% success rate (31 out of 36 patients) following the PUL procedure, with five surgical failures-four occurring immediately postoperatively and one at three months post-surgery (4). In their study, Brasoveanu et al. demonstrated that, at 6, 12, and

18 months post-surgery, 28 out of 40 patients (70%) achieved improvement through mesh-free PUL repair. Notably, the incidence of complications such as acute urinary retention, dyspareunia, vaginal erosion, and chronic pelvic pain was reported as 0% in this study (5).

Mesh-free PUL surgery is an affordable and straightforward method that requires less surgical expertise. There are very few studies in the literature investigating the effectiveness and complications of PUL surgery. No serious complications have been reported to date for this technique, which is described as minimally invasive.

CONCLUSION

According to the short-term follow-up results of this study, mesh-free pubourethral ligament surgery was found to be highly effective in the treatment of stress urinary incontinence. Further randomized controlled trials are needed to evaluate the long-term efficacy, complications, and comparison of this technique with other surgical methods.

References

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