

Correspondence

Total mesh excision via divergent approaches: Two case reports and literature review



Dear Editor,

The introduction of mesh procedures to treat stress urinary incontinence (SUI) in women represents a significant milestone breakthrough and currently serves as the primary surgical approach for addressing SUI. Since the FDA's statement on mesh sling complications in 2008, an increasing number of patients have sought total excision of the polypropylene (PP) sling from their bodies. Currently, there are a few reports on PP sling removal through different routes, but a unified and specific surgical technique has not yet been established. The aim of this article is to report the successful techniques and approaches used in two cases involving the total removal of PP meshes resulting from tension-free vaginal tape (TVT) and transobturator tape (TOT) via different approaches. Additionally, we discuss the clinical outcomes and review relevant literature on this topic.

Case 1: A 50-year-old woman, underwent a comprehensive surgical procedure on December 4, 2018. The procedure included transvaginal hysterectomy, left adnexectomy, right salpingectomy, high uterosacral ligament suspension (HUS), TVT-E (GYNECARE TVT™ EXACT™ Continence System) placement, anterior vaginal wall native tissue repair, and cystoscopy to address cystocele and SUI. After discharge, the patient reported discomfort due to a sensation of a foreign body in her vagina. Despite ineffective conservative treatment, she underwent vaginal surgery to remove a total of 6 cm of the sling (approximately 3cm on each side from the midline of the vagina) at a local hospital. Due to persistent discomfort, a total sling removal was performed via an abdominal transverse incision 2cm above the pubis on January 8, 2020.

Case 2: A 48-year-old woman was admitted, experiencing severe perineal and thigh pain for a year after a TOT procedure conducted on April 1, 2022, at a local hospital. Despite a second operation in August 2022, involving partial excision of the TOT sling, the patient continued to report intense pain, especially during activity and walking. The patient's vulva and thigh skin appeared normal. The vaginal mucosa was intact and smooth, and a rigid, immovable mesh-like material was detected in the left groin area. An internal vaginal examination revealed tenderness at the top of the left obturator foramen. The patient's preoperative Visual Analog Scale (VAS) score was 7. On April 2, 2023, the patient insisted on the total excision of the sling, leading to an operation to excise the TOT slings from both thigh roots.

Regarding Case 1, the patient was thoroughly informed about the potential challenges, including the risks of incomplete removal and the possibility of ongoing symptoms. The patient was in a supine position, and a 5cm long transverse incision, approximately 2cm above the pubis, was carefully made. The sling ends were located (see Fig. 1A) and both slings, which had shifted laterally by approximately 2cm from the original puncture site, were successfully identified. One end was securely

held with an Allis clamp, and a careful dissection was performed downwards along the sling to its root, clamped, and cut it at its root. The same process was performed on the other side. The total length of the excised sling was around 18cm. Following the surgery, the patient's symptoms were effectively relieved. At the three-month postoperative follow-up, the patient reported no symptoms of SUI. Unfortunately, the patient was subsequently lost to follow-up.

Regarding Case 2, the patient was positioned in a low lithotomy position for the procedure. Upon palpation, a sling-like structure was identified at the root of the left thigh. A 5cm longitudinal incision was carefully made at the anticipated location of the sling, revealing its distinctive blue-white color (see Fig. 1B). The left sling, measuring 9cm, was carefully dissected from the thigh side towards the posterior aspect of the pubic ramus until its vaginal end. Similarly, on the right thigh, the same dissection was performed. To aid in sling identification, an additional 3cm longitudinal incision was made inside the vagina near the right pubic ramus. With the help of ultrasound guidance, the sling within the adductor brevis muscle of the thigh was successfully located, and the right sling, measuring approximately 6.5cm, was completely excised. In total, 15.5cm of the sling was removed from both sides. Postoperatively, the patient reported significant relief from sling-related pain. However, she developed cellulitis on the right thigh on the second postoperative day, although the wounds eventually healed completely after a month with regular dressing changes. On the first postoperative day, her VAS score decreased to 3, indicating reduced pain intensity. Furthermore, on the Global Impression of Improvement (PGI-I) scale, she consistently scored 1, even after 3 months following the surgery, indicating a highly positive outcome.

Clinically, the excision of slings is indicated for various reasons, particularly when persistent pain significantly impacts patients' quality of life, which may even lead to patient litigation. Studies have reported chronic thigh/inguinal pain in $\leq 1.5\%$ of cases.¹ With ongoing media attention on mesh complications and safety, indications for mesh removal have expanded beyond postoperative pain to encompass concerns and fears about potential long-term adverse effects of the sling inside the body. These fears and anxieties can drive patients to seek sling removal. For example, in Case 1, the patient strongly advocated for TVT removal due to concerns and anxiety about possible complications. Conversely, in Case 2, the patient requested sling removal due to pain at the root of the thigh in the obturator area.

The American Urogynecologic Society (AUGS) and the International Urogynecologic Association (IUGA) jointly published mesh guidelines in 2020.² Achieving 100% excision of the implanted mesh presents a significant challenge. In Case 2, we achieved total sling excision through three incisions in the vagina and the root of the thigh, guided by a

<https://doi.org/10.1016/j.gocm.2023.08.001>

Received 31 July 2023; Accepted 3 August 2023

Available online 23 August 2023

2667-1646/© 2023 The Authors. Publishing services by Elsevier B.V. on behalf of KeAi Communications Co. Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

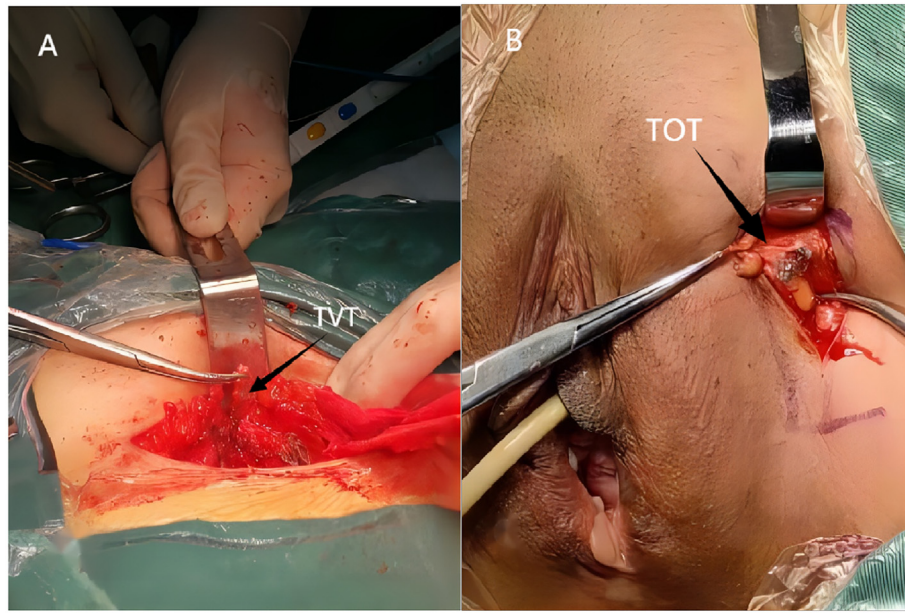


Fig. 1. The incisions and slings during operations. A. Case 1, the incision was located above the pubic, tension-free vaginal tape (TVT) was identified and clamped (black arrow). B. Case 2, the incision was located on the root of thigh, transobturator tape (TOT) in the left thigh was exposed after the skin incision (black arrow).

comprehensive understanding of the local anatomy in the obturator region. Following removal, the abundant muscles and blood vessels in the obturator area may pose a risk of delayed wound healing due to local exudation.

The process of total sling removal involves four essential steps: exploration, separation, rupture prevention, and confirmation. It is important to note that the thigh root route for sling removal presents more challenges than the retropubic route, with limited reported cases in the literature. Surgeons should ensure they are familiar with the local anatomy, prepare appropriate surgical instruments to avoid damaging muscle blood vessels and nerves, and consider factors affecting orthopedic postoperative wound healing before proceeding with surgery. Ultrasound assistance can prove valuable in guiding the procedure. Surgeons should also be aware that surrounding tissues can grow into the PP mesh sling, often necessitating sharp separation to ensure the safe and complete removal of the sling.

Patients must be fully informed about the risks associated with incomplete sling removal, which include the likelihood of residual symptoms and the potential for recurrent SUI postoperatively. They should also be aware of the risk of persistent pain, dyspareunia, and possible adverse events such as recurrent SUI, new-onset overactive bladder, urgency, incontinence, novel pain symptoms, and surgical complications. The recurrence rates of SUI post partial or total sling removal in patients with exposed PP sling and incontinence are 7% and 59%, respectively.³ The literature is divided on the necessity of total sling removal due to the potential risk of SUI recurrence.

Recent studies have reported various outcomes after PP sling removal. Patients may experience improvements in pain, but there are cases where pain may worsen or new pain symptoms may arise.⁴⁻⁶ Similarly, the occurrence of new-onset or recurrent incontinence has been observed in some patients post-sling removal. In our study, we found that one patient experienced improved worry-anxiety and significant improvement in mesh-related pain, while the other patient reported no recurrence of incontinence after sling excision.

The decision to consider the excision of slings should only be made after conservative treatments have proven ineffective, and it must be based on obtaining fully informed consent from the patient. However, before proceeding with sling removal, the doctor must thoroughly understand the patient's condition, accurately determine that the pain is indeed caused by the sling, and corroborate this with both medical

history and imaging. Surgeons carefully select the appropriate incision for partial or complete sling removal. They should customize surgical approaches, the extent of excision, and techniques based on factors such as the type of mesh used prior procedures, symptoms, and complications.

In conclusion, the removal of PP slings can significantly alleviate severe pain in certain patients, often leading to favorable outcomes. Nevertheless, this decision should be approached with great care, considering each patient's circumstances and providing them with comprehensive information about potential risks and benefits. An individualized and thoughtful approach is crucial to achieving successful outcomes in sling removal procedures.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Fourth Medical Center, General Hospital of People's Liberation Army. The patients provided written informed consent.

Funding

This research was supported by the National Key Research and Development Program of China (NO.2021YFC2009100).

References

1. Kershaw V, Nicholson R, Ballard P, et al. Outcome of surgical management for mid-urethral sling complications: a multicentre retrospective cohort study. *Int Urogynecol J.* 2020;31(2):329–336. <https://doi.org/10.1007/s00192-018-3853-6>.
2. Developed by the Joint Writing Group of the American Urogynecologic Society and the International Urogynecological Association. Joint position statement on the management of mesh-related complications for the FPMRS specialist. *Int Urogynecol J.* 2020;31(4):679–694. <https://doi.org/10.1007/s00192-020-04248-x>.
3. Jambusaria LH, Heft J, Reynolds WS, et al. Incontinence rates after midurethral sling revision for vaginal exposure or pain. *Am J Obstet Gynecol.* 2016;215(6):764.e1–764.e5. <https://doi.org/10.1016/j.ajog.2016.07.031>.

4. Abbas N, Virdee T, Basu M, et al. Clinical outcomes after total excision of trans-obturator tape inserted for treatment of stress urinary incontinence. *NeuroUrol Urodyn.* 2023;42(4):785–793. <https://doi.org/10.1002/nau.25155>.
5. Shower S, Boodhoo V, Licari O, et al. Total trans-obturator tape (TOT) removal; a case series including pain and urinary continence outcomes. *Int Urogynecol J.* 2023;34(5): 1017–1023. <https://doi.org/10.1007/s00192-022-05299-y>.
6. Anglim B, Zhao ZY, Parshad S, et al. Pain resolution and functional outcomes of total mesh excision: a case series. *Int Urogynecol J.* 2023. <https://doi.org/10.1007/s00192-023-05516-2>.

Wenying Wang, Yongxian Lu*

Department of Obstetrics and Gynecology, Fourth Medical Center, General Hospital of People's Liberation Army, Beijing, China

* Corresponding author.

E-mail address: yongxianlu@sina.com (Y. Lu).