

Improved Healing Through Early Transurethral Closure of Iatrogenic Bladder Fistulas Using a Minimal Suturing Device (MSD): Results of a 10-Year Case Series



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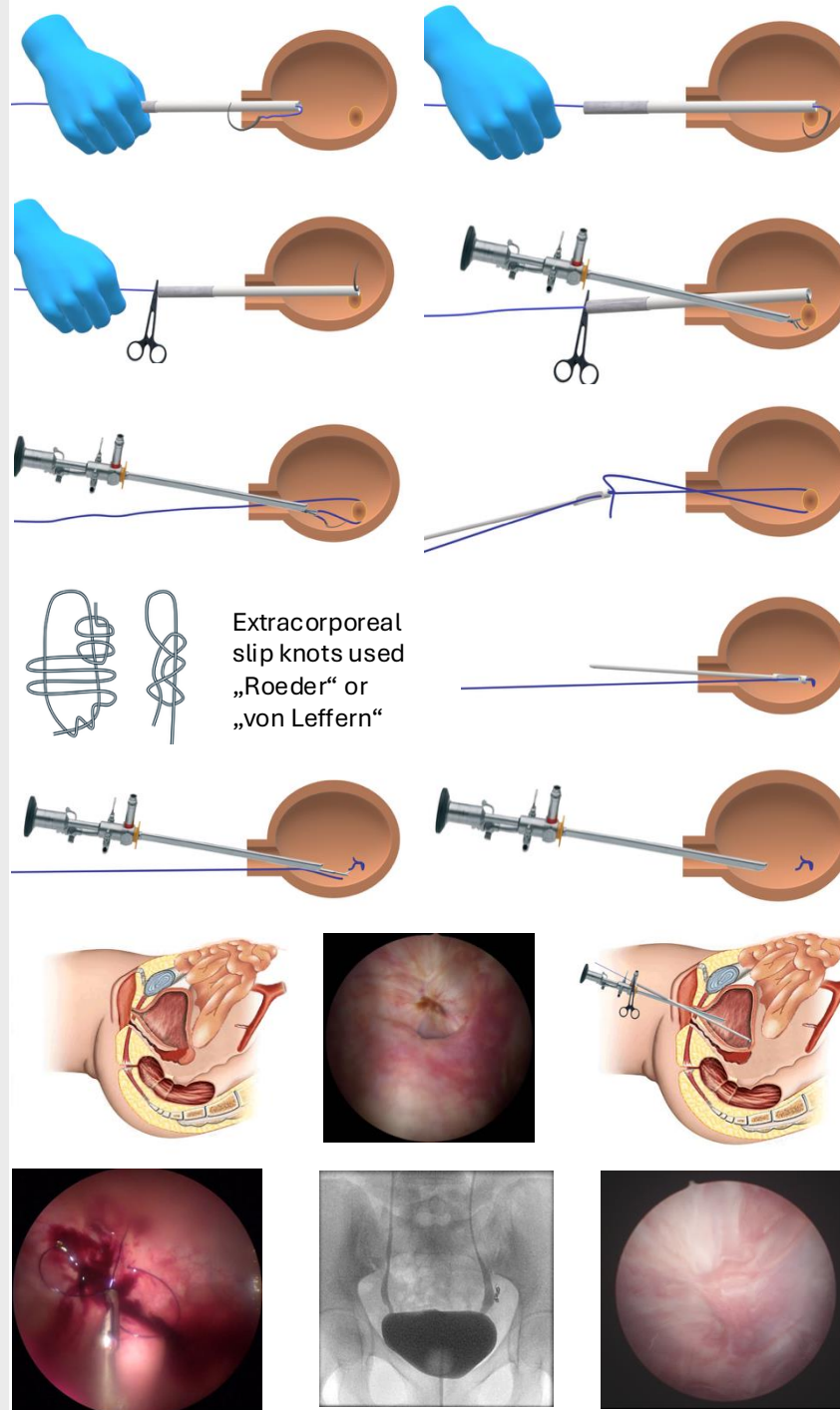
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HYPOTHESIS / AIMS OF STUDY

Conventional management of iatrogenic bladder injuries and vesicovaginal fistulas (VVF) relies on prolonged urinary diversion for 4–6 weeks to allow spontaneous healing. However, epithelialization of the fistula tract within 3–6 weeks may stabilize the defect and reduce the likelihood of closure, often necessitating delayed surgical repair. This study evaluates a novel approach of early minimally invasive closure of iatrogenic bladder lesions using a transurethral suturing (TUS) technique in a NOTES setting, aiming to improve healing rates by intervening prior to fistula tract maturation.

STUDY DESIGN, MATERIALS AND METHODS

Between 2016 and 2026, a total of 112 bladder lesions were treated. Transurethral closure alone was performed in 71 cases, while 41 cases required a combined approach (transurethral with vaginal or transrectal access). In lesions <4 weeks old, necrotic tissue was debrided followed by direct wound closure using transurethral suturing. In established fistulas, the fistula tract was resected using a monopolar cutting and coagulation mode (VIO III, Erbe) with a hook electrode under pneumocystoscopy. Closure was achieved using a Minimal Suturing Device (MSD) with 3-0 or 4-0 monofilament sutures. Knot tying was performed using a knot pusher in an interrupted single-knot technique with a slip knot. Postoperatively, maximal urinary diversion was maintained for 4–6 weeks.

RESULTS

The mean operative time was 43 minutes (range 19–121 minutes), and blood loss was less than 10 ml. Patients were discharged after a mean of 3 days, and the catheter was removed after 7 days.

INTERPRETATION OF RESULTS

The short operative time, minimal blood loss, and brief hospital stay indicate that the TUS-NOTES technique is a feasible and low-morbidity approach for the management of iatrogenic bladder lesions. Early intervention may prevent epithelialization of the fistula tract, thereby facilitating primary healing and potentially reducing the need for more invasive delayed procedures. The rapid postoperative recovery suggests an advantage over conventional approaches, although the absence of long-term outcome data, including closure and recurrence rates, limits definitive conclusions regarding efficacy.

CONCLUDING MESSAGE

Immediate transurethral closure of iatrogenic bladder injuries and fistulas using the TUS-NOTES technique is a safe and effective minimally invasive approach. Early intervention prior to epithelialization of the fistula tract may enhance healing and reduce recurrence rates. Additionally, this method is associated with lower morbidity, shorter hospital stay, and faster recovery compared to conventional abdominal or transvaginal techniques. Further controlled studies are warranted to validate these findings.