

CASE REPORT

Minimally invasive management of large seminal vesicle cyst in Zinner syndrome: Laser ablation for urinary retention

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Abstract

Background: In Zinner syndrome (ZS), surgical intervention is recommended for pediatric patients with symptomatic disease. It is generally believed that cyst aspiration alone may lead to symptom recurrence. Although comprehensive surgical excision is often advocated to prevent recurrence, a combined approach of cyst aspiration and maximal cyst wall ablation may also provide lasting symptom relief.

Case Presentation: A 14-year-old boy with a long-standing history of voiding difficulties presented with acute urinary retention. Pelvic magnetic resonance imaging revealed a 5 cm × 4 cm × 3.5 cm cystic lesion arising from the right posteroinferior prostate and compressing the bladder. Transurethral laser ablation of the ejaculatory duct cyst was performed using a holmium:YAG laser (0.8 J, 10 Hz). The patient recovered uneventfully and was discharged on postoperative Day 1. At the 1-year follow-up, he remained asymptomatic with normal uroflowmetry findings and only a small residual cyst visible on ultrasound.

Conclusion: For the management of large seminal vesicle cysts in ZS, combining cyst aspiration with cyst wall ablation provides an effective, safe, and durable therapeutic approach.

KEYWORDS

endoscopic treatment, pediatric urology, Zinner syndrome

1 | BACKGROUND

In Zinner syndrome (ZS), surgical intervention is recommended for pediatric patients with symptomatic disease. It is believed that cyst aspiration alone may lead to symptom recurrence. Although comprehensive surgical excision is recommended to prevent recurrence, a combined approach of cyst aspiration and maximal cyst wall ablation may provide lasting symptom relief^[1].

2 | CASE PRESENTATION

A 14-year-old male patient with a long-standing history of lower urinary tract symptoms, primarily characterized by voiding difficulties, presented to our clinic with acute urinary retention. A urinary catheter was inserted, draining 530 mL of urine from the bladder. Renal function tests were within normal limits, with a serum creatinine level of 0.8 mg/dL and an estimated glomerular filtration rate of 102 mL/min/

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1.73 m². The patient had no history of recurrent urinary tract infections, reported no sexual symptoms, and was in the peripubertal stage. Pelvic magnetic resonance imaging (MRI) revealed a cystic lesion measuring approximately 5 cm × 4 cm × 3.5 cm, arising from the right posteroinferior aspect of the prostate gland. The lesion, hyperintense on both T1- and T2-weighted images, was compressing the bladder. Additionally, right-sided renal agenesis was noted. Based on these findings, a diagnosis of ZS was suspected (Figure 1).

3 | METHODS

The patient underwent urethrocystoscopy using a 7.5F pediatric compact cystoscope (Karl Storz). Through the verumontanum, access to the ejaculatory duct was achieved, allowing laser ablation of the obstructing cyst wall and drainage of the seminal vesicle cyst contents. The duct opening was subsequently dilated, followed by maximal ablation of the cyst wall. During the procedure, a holmium:yttrium-aluminum-garnet (Ho:YAG) laser was applied using a 270-μm fiber at an energy of 0.8J and a frequency of 10 Hertz. The surgical procedure is demonstrated in detail in Supporting Information (Video S1).

4 | RESULTS

The patient was discharged on the first postoperative day, and no postoperative complications were observed. The urinary catheter was removed on postoperative day three. Uroflowmetry demonstrated a maximum flow rate of 23 mL/s, a voided volume of 190 mL, and a post-void

residual of 18 mL (Figure 2). A urinary ultrasound performed 1 month after surgery revealed a 12 mm cyst at the surgical site. At the 1-year follow-up, the patient remained completely asymptomatic.

5 | DISCUSSION

ZS is a rare congenital malformation characterized by the classic triad of ipsilateral ejaculatory duct obstruction, seminal vesicle cyst, and renal agenesis^[2]. The clinical presentation varies depending on the size of the seminal vesicle cyst, its spatial relationship with adjacent organs, and the presence of associated anomalies^[3]. In our case, the patient presented with lower urinary tract symptoms and acute urinary retention.

In symptomatic patients, various management strategies have been reported in the literature, including open and minimally invasive surgical excision via transperineal, transvesical, transabdominal, or retroperitoneal approaches^[4–7]. Meanwhile, transurethral approaches can also be performed successfully, offering the advantage of fewer complications and a shorter recovery period^[8]. Consistent with previous reports^[9,10], our case demonstrates that holmium laser ablation can be effectively and safely used in the treatment of seminal vesicle cysts.

6 | CONCLUSIONS

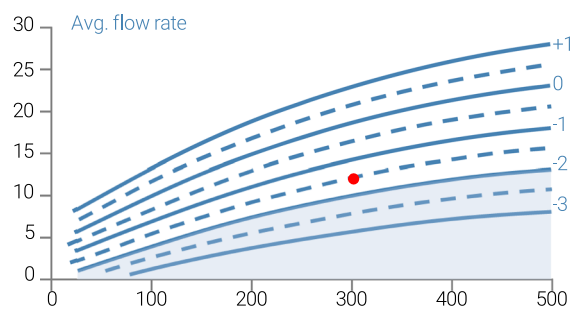
For the management of large seminal vesicle cysts in ZS, a combined approach of cyst aspiration and cyst wall ablation provides an effective, safe, and durable therapeutic option.



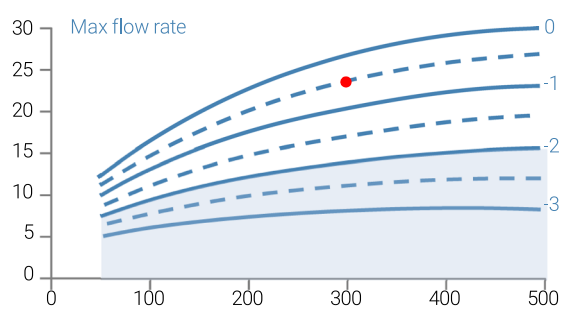
FIGURE 1 Magnetic resonance imaging images. (A) Enlargement of ejaculatory duct. (B) Dilated and cystic right seminal vesicle. (C) Visualization of the left kidney and absence of the right kidney.



SIROKY NOMOGRAM - AVG. FLOW RATE



SIROKY NOMOGRAM - MAX FLOW RATE



RESULTS

Avg. flow rate	12.9 ml/s
Max flow rate	23.6 ml/s
Time to max flow	8 s
Voided volume	190.1 ml
Voiding time	23 s
Flow time	23 s
Delay time	17 s
PVR	18 ml

COMMENTS

FIGURE 2 Postoperative uroflowmetry.

AUTHOR CONTRIBUTIONS

Tarkan Soygür and Muhammed Arif Ibis conceived the original idea and contributed to the study conceptualization. Zafer Tokatlı and Tarkan Soygür performed the surgical procedure. Araz Musaev and Muhammed Arif Ibis were responsible for video editing. Muhammed Arif Ibis, Araz Musaev, and Tarkan Soygür drafted the original manuscript and contributed to the literature review and manuscript revision. All authors reviewed and edited the manuscript, made substantial contributions to the conception, interpretation, and execution of the study, and approved the final version of the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Due to privacy restrictions, the data are not publicly available.

ETHICS STATEMENT

This case report adheres to the highest standards of ethical conduct in research and publication. Patient information has been appropriately de-identified or excluded to protect privacy. This study conforms to the ethical guidelines of the Declaration of Helsinki and relevant institutional standards for the research and publication of anonymized patient data. Permission was obtained from the family.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.