

Andrology and fertility

## Robotic-assisted laparoscopic vesiculectomy in a patient with atypical Zinner syndrome presenting with large cyst involving bilateral seminal vesicles and vasa deferentia

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### Introduction

First described by Zinner in 1914, Zinner syndrome is a congenital triad of mesonephric (Wolffian) duct abnormalities comprising of unilateral renal agenesis or dysgenesis, ipsilateral seminal vesicle cyst, and ejaculatory duct obstruction. These patients typically present in the third or fourth decade of life with myriad symptoms, including pelvic or perineal pain, dysuria, painful ejaculation, and infertility.<sup>1</sup> Depending on the size of the seminal vesicle cyst, and severity of symptoms, patients may be prospectively observed or may require surgical resection of the cyst. We present an unusual case of Zinner syndrome with bilateral seminal vesicle involvement and ectopic insertion of both vasa deferentia in a single cyst with concomitant unilateral kidney and ureter agenesis, successfully managed by robotic-assisted laparoscopic vesiculectomy.

### Presentation of case

A 21-year old Hispanic male patient presented to clinic complaining of a 3-month history of lower abdominal and pelvic pain, as well as bouts of constipation. Digital rectal examination revealed a large, palpable mass. Abdominal exam revealed an anteriorly displaced bladder. Urinalysis and routine blood tests were unremarkable. Computed tomography (CT) revealed an 8 × 9x8 cm cystic lesion arising from the seminal vesicles which corresponded to an enhancing cyst on T2 weighted magnetic resonance imaging (MRI) (Figs. 1 and 2). Abdominal imaging also revealed absence of the left kidney and ureter. Subsequent semen analysis revealed complete azoospermia with low semen volume and acidic pH, indicative of ejaculatory duct obstruction. This constellation of findings was diagnostic of Zinner syndrome.

Our patient was consented for a robotic-assisted vesiculectomy. Preoperative transrectal ultrasound (TRUS) revealed an 8 cm well-circumscribed, anechoic lesion posterior to the prostate gland. Surgery was performed with the patient catheterized and in a 30-degree

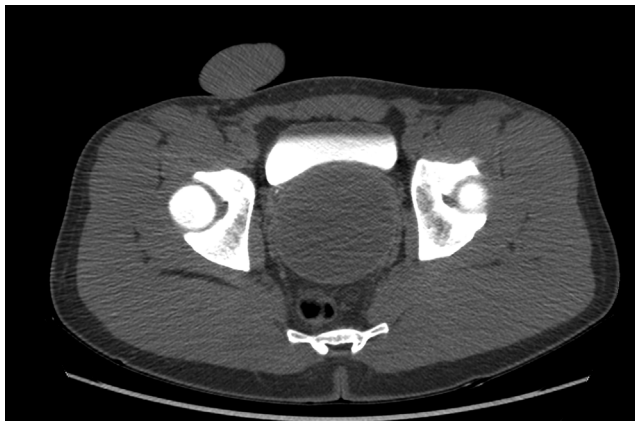
Trendelenburg position. We used a transperitoneal 4-arm approach with a 0-degree lens. After mobilizing the colon, the retrovesical peritoneum was dissected over the posterosuperior aspect of the large seminal vesicle cyst. Traction on the Foley catheter enabled us to visualize the bladder displaced just anteriorly to the cyst. Blunt dissection was used to peel the walls of the cyst away from the rectum posteriorly, the bladder anteriorly, and the pelvic sidewalls laterally. Bilateral vasa deferentia were seen entering the cyst posterolaterally and were clipped and cut distally just before they entered. After ensuring no ectopic ureteral insertion into the cyst wall, the cyst was incised and 350 cc of milky, white fluid was suctioned. With decompression, we saw that the cyst arose from bilateral seminal vesicles.

We used the PK dissector to cut away the cyst, using extreme caution near the neurovascular bundles. There was no residual seminal vesicle tissue left after excision. Bleeding was stopped with spot coagulation. The robot was undocked and cystoscopy was performed prior to removal of the specimen. Due to suspicion of right ureteral injury, a Pollack catheter was inserted into the right ureteral orifice and visualized safely traversing the right ureter using the robotic camera. The Pollack catheter and cystoscope were removed, the robot was re-docked, and surgical snow and human fibrin sealant were applied to achieve hemostasis. A Jackson-Pratt drain was introduced through a side port, and the specimen was removed using a laparoscopic entrapment bag. Fascia was closed and skin incisions were sutured and sealed with cyanoacrylate. Total console time was 40 minutes without complications. Estimated blood loss was 10 mL. The patient was discharged home same day with a Foley catheter. He returned to clinic in two days for catheter and drain removal and reported improved pressure symptoms. At one-month follow up, patient continued to remain asymptomatic.

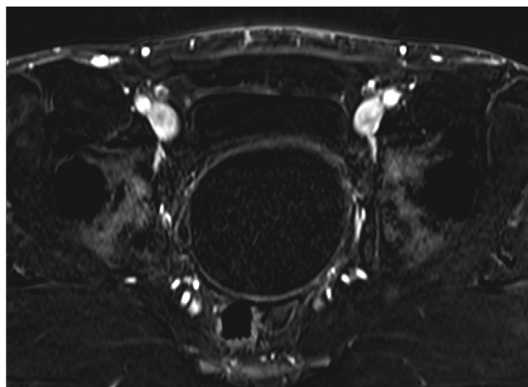
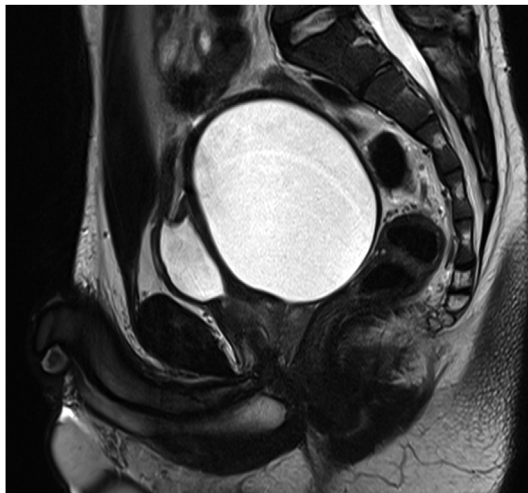
Pathological examination of the specimen revealed a unilocular cyst with markedly thickened wall (Fig. 3). Stems of two vasa deferentia were identified on the outside surface of the specimen. Microscopic examination of the cyst wall revealed thickened smooth muscle tissue

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**Fig. 1.** CT abdomen and pelvis with and without contrast. Axial cut at L-spine shows absent left kidney with pancreas shifted to occupy space. Axial cut at ilium shows 8 cm nonenhancing cyst.

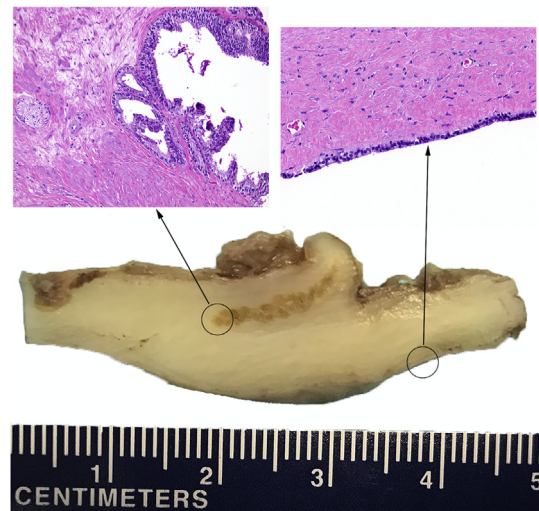


**Fig. 2.** MRI abdomen and pelvis with contrast. Parasagittal cut shows brightly enhancing cyst on T2 weighted imaging. Axial cut shows no septations or calcifications within cyst, with only an enhancing wall.

with inner surface lined by cuboidal to low columnar benign epithelium.

### Discussion

While open vesiculectomy via transperineal or transabdominal approach has historically been the surgical option for symptomatic seminal vesicle cysts, Kavoussi et al. showed how laparoscopy could be used to treat retrovesical lesions.<sup>2</sup> Since then, minimally invasive



**Fig. 3.** Gross appearance of the section of the cyst wall (formalin fixed). Cauterized outer surface of the cyst (upper) and smooth inner surface of the cyst (bottom). Left-hand side image indicates a portion of vas deferens penetrating through the wall of the cyst (20× magnification). Right-hand side image indicates a cuboidal to low columnar benign epithelium lining the cyst (40× magnification).

approaches have become favored in treatment of seminal vesicle pathology due to better visualization of pelvic anatomy, shorter hospital stay, and faster patient recuperation.<sup>3</sup> The use of laparoscopy paved the way for robotic-assisted surgery, with comparable patient outcomes and heightened surgeon comfort.<sup>4</sup> Specifically, Passerotti et al. showed that robotic resection of seminal vesicle cysts and prostatic utricles in children and adolescents yielded desirable outcomes.<sup>5</sup> We loosely based our approach on the posterior approach used by Ploumidis et al. in their 2012 case report.<sup>1</sup> Key differences included our decision to not obtain frozen sections, use of a Pollack catheter to identify the right ureter during the surgery rather than vessel loops, and spot coagulation for any bleeding.

Our patient with Zinner syndrome had a few unique characteristics that warrant mentioning. Although he had left-sided renal agenesis, he did not have an ipsilateral seminal vesicle cyst, but rather bilateral seminal vesicle involvement by a single cyst (as confirmed by no residual seminal vesicle tissue remaining *in situ* after cyst excision). Additionally, bilateral vasa deferentia entered the seminal vesicle cyst and contributed to the obstructive azoospermia seen in our patient. It is important to remember that while the classic triad of Zinner syndrome may be present, any disruption during weeks 4–13 of embryogenesis can affect proper development of the mesonephric duct and consequently the ipsilateral kidney, ureter, seminal vesicle, and vas deferens. To our knowledge, this is the first report of bilateral seminal vesicle and vasa deferentia involvement in a patient with Zinner syndrome.

### Conclusion

In symptomatic patients with Zinner syndrome, robotic-assisted surgical removal of the seminal vesicle cyst with a posterior approach is preferred due to greater ability to evaluate for other anatomic aberrancies, including ectopic ureter insertion, ectopic vasa deferentia insertion, and bilateral seminal vesicle cyst involvement. Additionally, this approach allows for more meticulous preservation of neurovascular bundles to preserve erectile function. While symptom improvement is rapid after surgery, infertility is still a concern warranting an andrologist referral.

### Conflicts of interest

None.

### Funding

None.

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