

Zinner Syndrome Presenting with Chronic Pelvic Pain in a Middle-aged Male: A Case Report

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ABSTRACT

Zinner Syndrome (ZS) is a rare congenital anomaly of the mesonephric (Wolffian) duct characterised by the classical triad of unilateral renal agenesis, ipsilateral seminal vesicle cyst, and ejaculatory duct obstruction. A 45-year-old male presented with chronic pelvic pain of two to three months duration associated with intermittent dysuria. Computed Tomography (CT) of the abdomen and pelvis demonstrated absence of the right kidney consistent with right renal agenesis and a large cystic lesion in the right seminal vesicle region. Dependent calcific foci within the cyst suggested inspissated secretions related to chronic ejaculatory duct obstruction. Magnetic Resonance Imaging (MRI) of the pelvis further characterised the lesion, revealing a well-defined cystic mass measuring approximately 9.7×8.1×17.5 cm located posterior to the urinary bladder. The lesion appeared hypointense on T1-weighted images and hyperintense on T2-weighted images with mild peripheral enhancement and no diffusion restriction. The cyst produced mass effect on adjacent pelvic structures while maintaining preserved fat planes. The imaging findings confirmed the diagnosis of ZS. The present case is distinguished by an unusually giant (17.5 cm) seminal vesicle cyst with dependent calcific/inspissated secretions, imaging features that are rarely reported in ZS. Recognition of these characteristic findings facilitates accurate diagnosis and appropriate management.

Keywords: Ejaculatory duct obstruction, Mesonephric duct anomaly, Pelvic cystic lesion, Renal agenesis, Seminal vesicle cyst

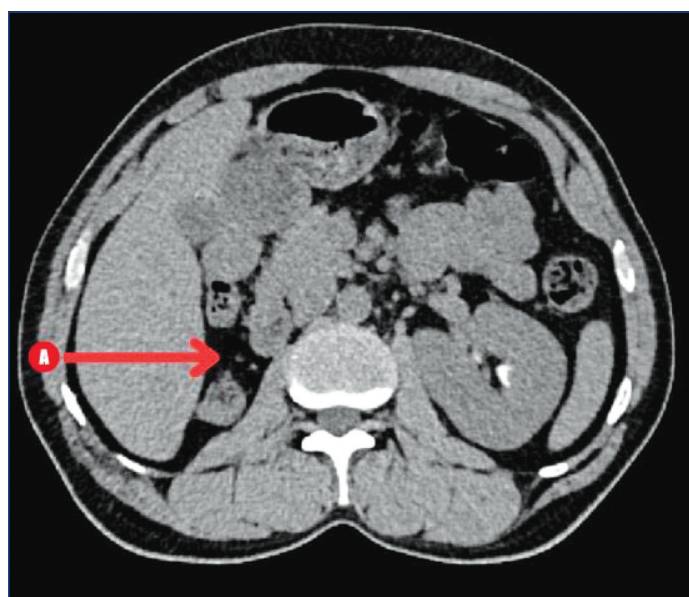
CASE REPORT

A 45-year-old male presented with intermittent lower abdominal and pelvic pain for the past two to three months. The pain was dull, non radiating, and occasionally associated with post-ejaculatory discomfort. The patient also reported mild intermittent dysuria but denied haematuria, fever, urinary frequency, or a history of urinary tract infection. There was no history of trauma, prior urological procedures, or known congenital anomalies. A detailed fertility evaluation, including semen analysis, was not performed during the initial diagnostic work-up because the patient presented primarily with pelvic pain and intermittent dysuria and was referred for radiological evaluation. The patient's marital status, paternity, and prior fertility assessment were not documented at the time of presentation. After imaging diagnosed ZS, the patient was referred to the Department of Urology for further clinical, fertility, and reproductive evaluation.

The patient's past medical and surgical history was unremarkable. Family history did not reveal any known congenital or hereditary genitourinary disorders. General physical examination was within normal limits. The patient was afebrile with stable vital signs. Abdominal examination showed no palpable masses, tenderness, or organomegaly. Digital rectal examination was unremarkable and did not reveal any abnormalities of the prostate.

Routine laboratory investigations, including complete blood count, renal function tests, and urinalysis, were within normal limits. Semen analysis, fertility assessment, serum Prostate-specific Antigen (PSA), uroflowmetry, cystoscopy, and transrectal ultrasonography were not available at the time of reporting.

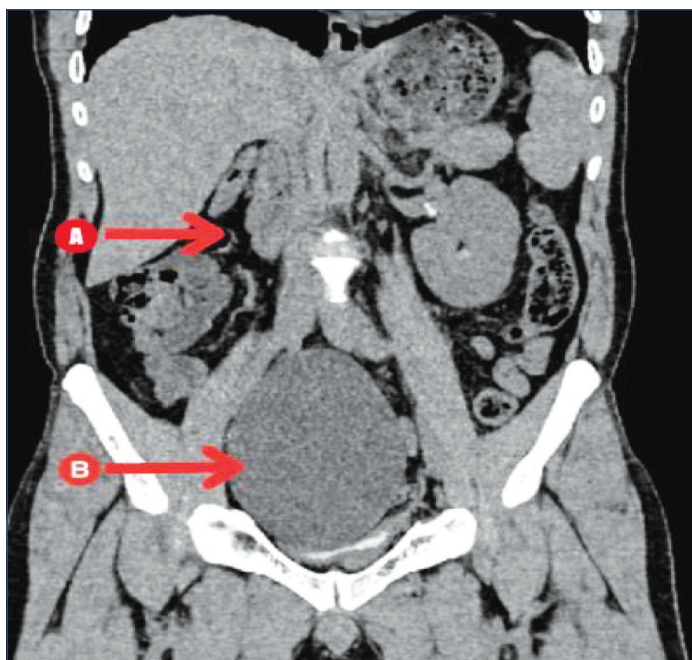
Ultrasonography was not performed prior to CT because the patient was referred directly for contrast-enhanced CT as part of the institutional diagnostic work-up for chronic pelvic pain. CT imaging demonstrated absence of the right kidney in the right renal fossa, consistent with right renal agenesis [Table/Fig-1]. The left kidney appeared normal in size, morphology, and position without evidence of hydronephrosis or other abnormalities.



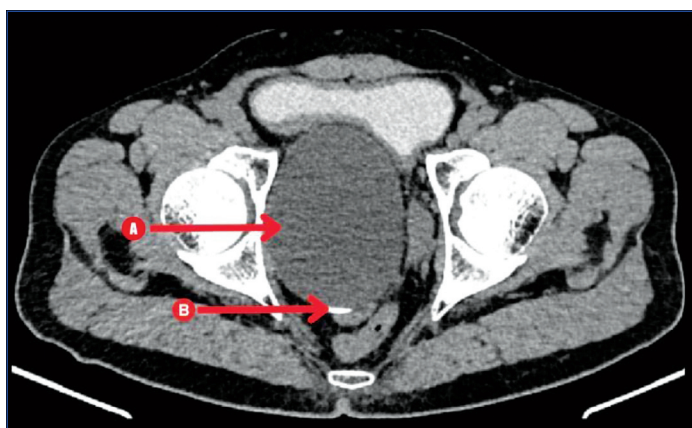
[Table/Fig-1]: Axial CT abdomen demonstrating (Arrow A) absence of the right kidney in the right renal fossa, consistent with right renal agenesis.

In addition, CT images revealed a large well-defined cystic lesion located in the pelvis posterior to the urinary bladder in the right seminal vesicle region [Table/Fig-2]. The lesion appeared homogeneous and demonstrated fluid attenuation. Dependent calcific foci were identified within the cystic lesion, likely representing inspissated secretions or “milk of calcium” associated with chronic ejaculatory duct obstruction [Table/Fig-3]. No pelvic lymphadenopathy or aggressive features were identified.

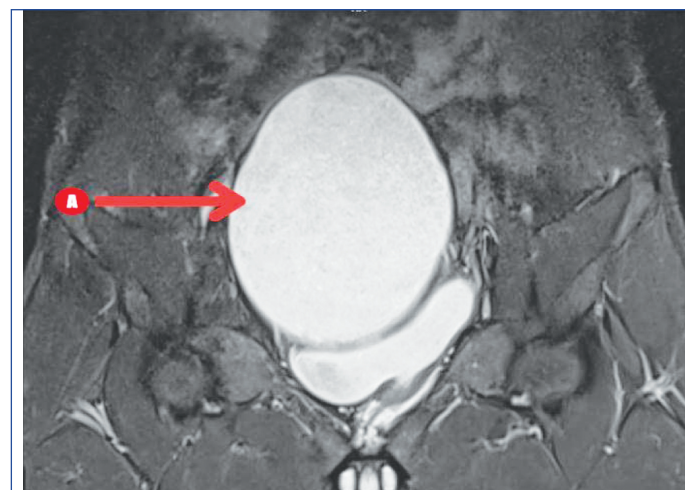
These CT findings raised suspicion for a seminal vesicle cyst associated with ipsilateral renal agenesis, suggesting a congenital mesonephric duct anomaly. The MRI demonstrated a large, well-defined, thin-walled cystic lesion measuring approximately 9.7×8.1×17.5 cm in the right paramedian pelvis, located posterior to the urinary bladder. The right seminal vesicle was not visualised



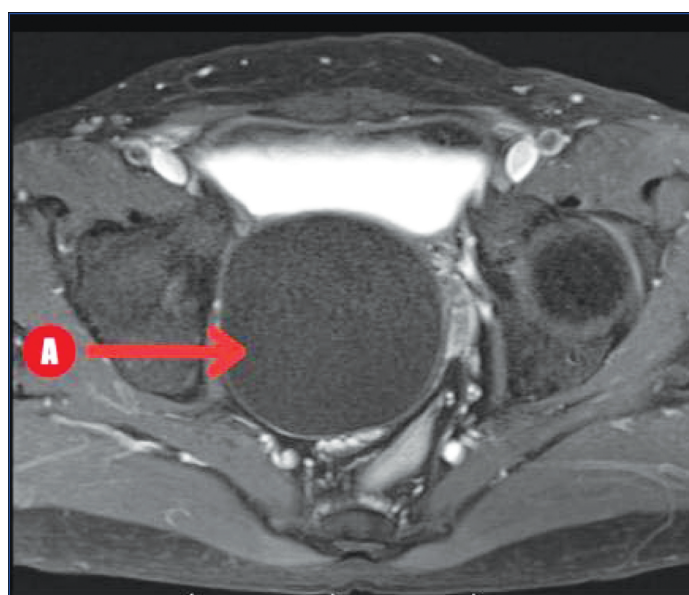
[Table/Fig-2]: Coronal CT abdomen and pelvis demonstrating (Arrow A) Absence of the right kidney in the right renal fossa consistent with right renal agenesis and (Arrow B) A large cystic lesion in the pelvis corresponding to a right seminal vesicle cyst.



[Table/Fig-3]: Axial CT pelvis demonstrating (Arrow A) A large well-defined cystic lesion and (Arrow B) Dependent calcific focus within the cyst.



[Table/Fig-4]: Coronal Turbo Inversion Recovery Magnitude (TIRM) MRI of the pelvis demonstrating a large hyperintense cystic lesion (Arrow A) arising from the right seminal vesicle posterior to the urinary bladder, producing anterior displacement of the bladder.



[Table/Fig-5]: (Arrow A) Axial T1-weighted post-contrast fat-saturated MRI of the pelvis demonstrating a large, well-defined cystic lesion.

separately from the lesion, indicating its origin from the right seminal vesicle. The lesion was hypointense on T1-weighted images and markedly hyperintense on T2-weighted images, without diffusion restriction on Diffusion-Weighted Imaging (DWI) Apparent Diffusion Coefficient (ADC) sequences. Mild peripheral wall enhancement was noted on post-contrast images, consistent with a large fluid-filled seminal vesicle cyst. The cyst produced significant mass effect on adjacent pelvic structures, resulting in anterior displacement of the urinary bladder, lateral displacement of adjacent bowel loops, and leftward displacement of the prostate gland. Despite its large size, the surrounding fat planes were preserved, with no evidence of local invasion. Coronal and axial MRI images clearly demonstrated the large hyperintense cystic lesion arising from the right seminal vesicle region posterior to the urinary bladder [Table/Fig-4,5]. The lesion extended superiorly into the lower abdomen, posteriorly toward the presacral region, and inferiorly up to the rectosigmoid junction while maintaining preserved fat planes with adjacent structures. Based on these characteristic imaging findings, the authors diagnosed ZS. The diagnosis was supported by the classical triad of right renal agenesis, a right seminal vesicle cyst, and imaging features suggestive of ejaculatory duct obstruction. As no surgical, cystoscopic, or histopathological confirmation was available, the diagnosis was based solely on imaging findings. The patient was referred to the Department of Urology for further evaluation. As the patient had stable symptoms, conservative management with clinical follow-up was advised.

DISCUSSION

The ZS is a rare congenital malformation of the male genitourinary tract resulting from abnormal embryological development of the mesonephric (Wolffian) duct. It is characterised by the classical triad of unilateral renal agenesis, ipsilateral seminal vesicle cyst, and ejaculatory duct obstruction [1,2]. Defective development of the distal mesonephric duct leads to abnormalities of both the upper urinary tract and ipsilateral seminal tract. Cyst-like lesions of the seminal vesicle are associated with the absence of kidneys on the ipsilateral side in males, and the incidence rate falls between 0.00035% and 0.0046% [3]. Patients may remain asymptomatic for several years and may subsequently present with pelvic or perineal pain, dysuria, painful ejaculation, recurrent urinary tract infection, haematospermia, or infertility.

Imaging plays a central role in diagnosing and characterising ZS. Ultrasonography may demonstrate a retrovesical cystic lesion and associated renal agenesis but may be limited in evaluating deep pelvic structures. CT provides excellent anatomical detail and is particularly useful for identifying renal agenesis and detecting calcification within a seminal vesicle cyst. MRI is considered the imaging modality of choice because of its superior soft-tissue contrast and multiplanar capability [4-6]. It allows accurate cyst characterisation, assessment of its contents, and delineation of its relationship to adjacent pelvic structures.

The differential diagnosis of a large retrovesical cystic lesion includes Müllerian duct cyst, prostatic utricle cyst, ejaculatory duct cyst, pelvic hydatid cyst, cystic seminal vesicle tumour, and retroperitoneal cystic lymphangioma. Müllerian duct cysts are typically midline and are not characteristically associated with ipsilateral renal agenesis, whereas prostatic utricle cysts are generally smaller, midline lesions related to the prostatic urethra. Ejaculatory duct cysts may be paramedian but are usually smaller and located within or adjacent to the prostate. Pelvic hydatid cyst is an important differential in endemic regions such as India; however, characteristic findings such as daughter cysts, detached membranes, or complex internal septations were absent. Retroperitoneal cystic lymphangiomas are generally multiloculated and septated and tend to insinuate between adjacent structures. In the present case, the right paramedian location, clear origin from the right seminal vesicle, and associated ipsilateral renal agenesis strongly favoured ZS.

A cystic seminal vesicle neoplasm is an important, although rare, differential diagnosis, particularly because mild peripheral wall enhancement was observed in the present case. However, the lesion was well defined and thin-walled, without an enhancing mural nodule or solid component, diffusion restriction, local invasion, or loss of surrounding fat planes. These findings favoured a benign seminal vesicle cyst, and the mild peripheral enhancement was considered non specific cyst-wall enhancement rather than evidence of malignancy.

Management of ZS should be individualised based on the patient's symptoms, cyst size, complications, and fertility considerations. Asymptomatic patients, particularly those with small cysts, can generally be managed conservatively with periodic clinical and imaging follow-up. Selected patients with mild symptoms may receive symptomatic or medical therapy, although evidence supporting pharmacological treatment is limited. For persistent or significant symptoms, infertility attributable to the lesion, or large cysts causing mass effect, invasive treatment may be considered. Image-guided aspiration or drainage can provide temporary symptomatic relief but carries a considerable risk of recurrence and is therefore generally not considered definitive treatment. Definitive surgical management includes excision of the seminal vesicle cyst, performed by open, laparoscopic, or robotic approaches [7].

In the present case, the seminal vesicle cyst measured 17.5 cm and produced significant mass effect, including anterior displacement of the urinary bladder, lateral displacement of adjacent bowel loops,

and leftward displacement of the prostate. Given its unusually large size and compressive effect, definitive surgical treatment would be an important consideration if symptoms persisted, progressed, or obstructive complications developed. However, as the patient's symptoms were stable at the time of reporting, he was referred to the Department of Urology and initially managed conservatively with clinical follow-up.

Abakar D et al., reported that patients with ZS commonly present with non specific symptoms such as pelvic pain, dysuria, and ejaculatory discomfort [1], comparable to the presentation in the present case. Mehra S et al., emphasised the importance of MRI in demonstrating seminal vesicle cysts and their anatomical relationship with surrounding pelvic structures [2]. Tan Z et al., noted that larger cysts are more likely to produce symptoms due to compression of adjacent pelvic structures [8].

CONCLUSION(S)

The present case is distinguished by an unusually large seminal vesicle cyst with dependent calcific/inspissated secretions, imaging features rarely reported in ZS. CT identified ipsilateral renal agenesis and intralesional calcific foci suggestive of chronic obstruction, while MRI provided superior characterisation of the seminal vesicle cyst and its relationship to surrounding pelvic organs.

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