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Migration of varicocele coil leading to ureteral obstruction and hydronephrosis: A case report

Abdulaziz Alamri

Abstract

BACKGROUND
Varicocele embolization, a minimally invasive treatment for symptomatic varicoceles, carries a rare risk of complications like ureteral obstruction and hydronephrosis. This case report documents such a case to raise awareness of these potential complications and showcase minimally invasive surgical management as a successful solution.

CASE SUMMARY
A 35-year-old male presented with flank pain and hematuria following varicocele embolization. Imaging confirmed left ureteral obstruction and hydronephrosis. Laparoscopic ureterolysis successfully removed the embolization coil and repaired the ureter, resolving the patient's symptoms. Follow-up at six months and two years showed sustained improvement.

CONCLUSION
Minimally invasive surgery offers an effective treatment option for rare complications like ureteral obstruction arising from varicocele embolization.

Key Words: Varicocele embolization; Ureteral obstruction; Hydronephrosis; Iatrogenic ureteral injury; Laparoscopic ureterolysis; Minimally invasive surgery; Case report

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Core Tip: Varicocele embolization is a minimally invasive procedure that is generally considered safe, but complications can occur, such as ureteral obstruction and hydronephrosis. It is important to be aware of the potential complications of varicocele embolization, even though they are rare. Minimally invasive surgery can be used to successfully treat the complications of varicocele embolization. If a patient develops flank pain and hematuria following varicocele embolization, imaging studies should be performed to rule out ureteral obstruction and hydronephrosis. If the ureteral obstruction is diagnosed, minimally invasive surgery can be performed to remove the obstructing coil and repair the ureter.

INTRODUCTION
In order to treat symptomatic varicoceles, a well-proven treatment called varicocele embolization is employed. It entails the percutaneous insertion of embolic material into the varicocele's dilated veins, such as coils or sclerosants. A new generation of hydrogel-coated platinum coils has been developed as a result of recent technical developments in interventional neuroradiology embolization. The coil may grow up to three times its initial volume because of its hydrogel covering. A very stable and long-lasting platform for blood stasis and thrombus development is provided by the combination of a platinum coil and an expanding hydrogel polymer. Despite being regarded as a safe technique, a number of issues, such as embolic material migration, have been recorded. Here, we present a case of ureteral blockage brought on by a migrating varicocele coil that led to hydronephrosis.

CASE PRESENTATION
Chief complaints
A 35-year-old male patient presented with progressive left-sided flank pain for several years. The pain was mild, lasting only a few minutes and non-radiating. It was not associated with any voiding symptoms or gastrointestinal complaints. The patient also reported intermittent hematuria, with periods of no blood in the urine and no accompanying pain.

History of present illness
The patient underwent varicocele embolization 11 years prior to presentation to alleviate testicular discomfort and swelling. His post-operative period was uneventful. However, several years later, he developed the aforementioned left-sided flank pain.

History of past illness
No significant past medical history was reported.

Personal and family history
The patient denied any history of tobacco use, alcohol abuse, or recreational drug use. Family history was unremarkable for any relevant conditions.

Physical examination
Physical examination revealed no flank tenderness, abdominal distention, or other obvious signs of distress.

Laboratory examinations
Laboratory investigations, including renal function tests and urinalysis, were unremarkable.

Imaging examinations
Kidneys, ureters and urinary bladder (KUB) (plain abdominal X-ray): Revealed bilateral refilling of the coils from the previous varicocele surgery (Figure 1).
Ultrasound imaging of the KUB abdomen: Demonstrated moderate left hydronephrosis and hydro-ureter. The ultrasound showed a dilated pelvicalyceal system as branching, interconnected areas of decreased echogenicity in the renal collecting system (Figure 2).
Contrast-enhanced computed tomography (CT) of the abdomen and pelvis: Revealed a migrated varicocele coil within the distal left ureter, causing luminal narrowing and subsequent hydronephrosis. No evidence of ureteral perforation or surrounding infection was observed. The proximal ureter appeared dilated, and the ipsilateral kidney showed moderate hydronephrosis (Figures 3 and 4).
Figure 1 Plain abdominal X-ray (kidneys, ureters and urinary bladder) showing refilling of the coils bilaterally for previous surgery of varicocele.

Figure 2 Ultrasonography of the left kidney showing hydronephrosis and ultrasonography after surgical repair. A: Ultrasound of the left kidney showing hydronephrosis; B: Ultrasound after surgical repair (end-to-end ureteric anastomosis) showing normal kidney with no residual hydronephrosis.

Figure 3 Computed tomography of the abdomen. A: Axial; B: Coronal views showing the coils and left hydro ureter.

Differential diagnosis
In the case of migration of a varicocele coil leading to ureteral obstruction and hydronephrosis, several differential diagnoses should be considered. These include urolithiasis (kidney stone), ureteral stricture, retroperitoneal fibrosis, ureteral tumor, ureteral injury, and other causes of ureteral obstruction, blood clots, ureteral strictures, or congenital abnormalities. It is important to conduct a thorough clinical evaluation, including a detailed clinical history, physical
Figure 4 Computed tomography scan axial view showing left hydronephrosis due to obstructed ureter by the varicocele coils.

examination, and appropriate imaging studies, to arrive at an accurate diagnosis. Collaboration with urologist would be crucial for further therapeutic management and treatment of the patient.

FINAL DIAGNOSIS

Migration of varicocele coil leading to left ureteral obstruction and hydronephrosis.

TREATMENT

The patient was referred to urologist for further management. Given his symptoms and imaging findings, the decision was made to intervene surgically to remove the migrated coil and relieve the ureteral obstruction. Under general anaesthesia, the patient underwent a laparoscopic ureterolysis using a left retroperitoneal approach. Access to the pelvis was achieved using a 10 mm umbilical trocar for the camera, another 10 mm trocar at the mid-clavicle line for the right-hand port, a 5 mm left hand port located approximately 8 cm superior to the camera port in the same midline, and finally a 5 mm port placed laterally at the anterior axillary line for tissue traction and insertion of the double-J stent during the procedure. This was followed by ureteric resection of the compressed narrowed part (approximately 2 cm). The migrated coil was visualized intraoperatively as shown in Figure 5. Finally, an end-to-end anastomosis was performed over a stent. A drain was placed for 2 d, and the patient was discharged the following day.

OUTCOME AND FOLLOW-UP

The postoperative recovery was uneventful with no complications. The patient's flank pain resolved shortly after surgery. A follow-up ultrasound imaging and CT scan at three months post-surgery showed complete resolution of hydronephrosis, normalization of renal function, and restoration of normal ureteral caliber. The patient remained asymptomatic during the subsequent six-month follow-up period with no recurrence of varicocele or ureteral obstruction. At two years follow-up, the patient reported continued absence of pain and no other complaints.

DISCUSSION

A pampiniform venous plexus that is abnormally twisted and dilated inside the spermatic cord is known as a varicocele. In the overall male population, varicocele is thought to affect 15% of population. In males with primary infertility, its frequency rises with age and can reach 35%[4]. One of the most typical factors contributing to men's reversible infertility is varicocele. Men with varicocele are thought to have many significant therapy options, including varicocelectomy and
percutaneous embolization of the gonadal vein[5]. With just minimal sedation needed, percutaneous embolization provides a less invasive, nonsurgical approach for the treatment of varicoceles. The gonadal vein and collateral venous supplies can also be identified during the surgery by using diagnostic venography[4].

Varicocele embolization is a frequently used procedure with a low risk of complications. Hydronephrosis and ureteral obstruction can result from embolic material migration, a rare but potentially serious side effect[6,7]. The two major treatments for males with varicocele are surgical ligation and percutaneous embolization of the internal spermatic vein[8]. Percutaneous embolization is less expensive and less intrusive than surgical ligation; it just needs local anesthesiology and provides visibility of the interior spermatic vein and any potential collaterals[9,10]. Several embolic materials have been utilized, with coils being the most popular and glue becoming a more popular substitute[11,12].

Varicocele coil migration is a rather uncommon complication, with few occurrences having been documented in the literature[13]. As observed in our example, coil migration might happen right away following the embolization treatment or months later. The precise cause of migration is unknown, however it is believed to be connected to the coil's design, the anatomy of the patient, or technical aspects of the embolization technique[14].

This case report demonstrates how important is to closely follow patients who have had varicocele embolization and to assess them as soon as any new or worsening symptoms appear. For obtaining an accurate diagnosis and creating a treatment plan, ultrasound and CT imaging modalities are essential. When migrating coils restrict the ureter because of the obstruction the coils produce, surgery can be required.

The unhindered ureter's subsequent alterations in cytokine/chemokine and lymphocyte levels point to the existence of crosstalk caused by a systemic immune response. It may be crucial to stop obstruction-induced ureteral remodeling to avoid long-term problems[14].

This case report of varicocele coil migration causing ureteral blockage and hydronephrosis is unique. Only few similar case reports were noted.

Retrieving the migrated coil and alleviating ureteral obstruction are required for the management of varicocele coil migration. There are several methods that can be used, such as surgical intervention, endourological methods, or cystoscopic retrieval. The position of the migrated coil, patient characteristics, and surgeon experience all influence the therapeutic option.

CONCLUSION
It is an uncommon but potentially dangerous consequence when varicocele embolization coils migrate, causing ureteral blockage and hydronephrosis. This illness can be effectively managed with prompt diagnosis and proper care, including surgical interventions. When examining patients who have persistent or getting worse symptoms after varicocele embolization, clinician should be aware of this possible consequence and take it into consideration in the differential diagnosis. In order to reduce the risk of coil migration and improve patient outcomes, more research is required.

FOOTNOTES
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