Blunt force trauma as a rare mechanism for chyluria

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Chyluria is an uncommon clinical entity outside of the tropics. We present a rare case of blunt force trauma leading to the formation of a lymphorenal fistula. This was successfully managed via conservative endoscopic and dietary treatment.

Key Words: chyluria, trauma

Introduction

Chyluria occurs secondary to an abnormal communication between retroperitoneal lymphatics and the renal collecting system with subsequent drainage of lymph and chylomicrons into the urinary tract.[1] Worldwide, chyuria is most often seen as a late manifestation of filariasis and chronic lymphatic obstruction.[2] In developed nations, the most common etiologies include chronic infection with tuberculosis, tumors of the kidney and retroperitoneum, and surgical trauma from partial nephrectomy or radiofrequency ablation of renal tumors.[3-5] Spontaneous resolution has been reported in approximately half of patients, however if the volume of chyle that drains through the urinary system becomes persistent and significant, malnutrition, hypoproteinemia, hypovolemia, and impaired immune function can result.[2,6] We report a rare case of chyluria following blunt force trauma and its subsequent successful management.

Case report

A 48-year-old Mandarin man was initially seen in consultation by the urology service for acute urinary retention. His past medical history was only significant for a L1 compression fracture which he sustained in a motor vehicle accident 4 weeks prior. His lumbar fracture was being conservatively managed with a brace and he was taking no medications other than occasional NSAIDS.

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In the emergency department initial attempts to manage his urinary retention with a 16 Fr foley catheter were unsuccessful, as the catheter quickly became occluded with a thick milky white fluid. Successful drainage of his bladder ultimately required placement of a large bore catheter and continuous bladder irrigation.

The only abnormal finding on initial laboratory workup was significant proteinuria on urinalysis. His serum creatinine was 0.9 and white blood cell count was 4.3. His nutritional status was normal with a prealbumin of 22, and his triglycerides and total cholesterol were within normal limits. A non-contrast CT scan of the abdomen and pelvis demonstrated the known L1 fracture and a decompressed bladder with a foley, but failed to demonstrate any hydronephrosis, gross renal trauma or fat/fluid levels within the kidneys. His urine culture ultimately demonstrated no growth, however a 24 hour urine collection obtained following inpatient admission demonstrated over 8 grams of protein, as well as chylomicrons and fat bodies.

Filariasis was ruled out with a nocturnal peripheral smear negative for microfilariae and an absence of serum and urinary eosinophilia. An additional attempt to radiographically identify the lymphorenal fistula included lymphoscintigraphy, which was also unremarkable. After 48 hours of persistent gross chyluria, he was taken to the operating room for endoscopic investigation. Cystoscopy demonstrated efflux of a milky fluid from the right ureteral orifice, Figure 1, and a right retrograde pyelogram demonstrated a lymphorenal fistula, Figure 2. We were, however,

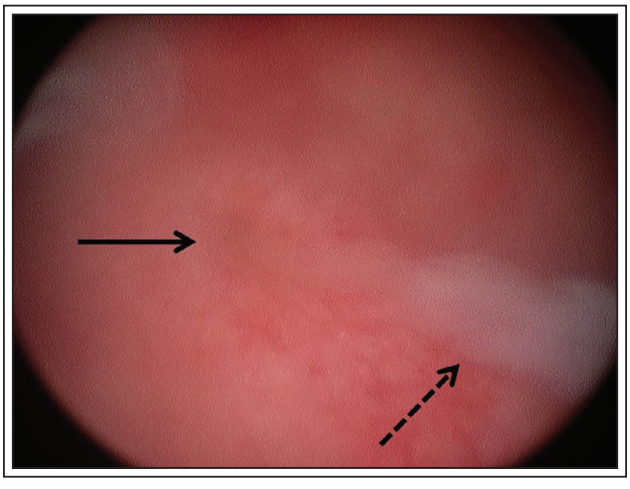

Figure 1. Cystoscopic image of the right ureteral orifice (solid arrow). The bladder is clouded with milky urine, however obvious efflux of milky urine is seen from this side (broken arrow).

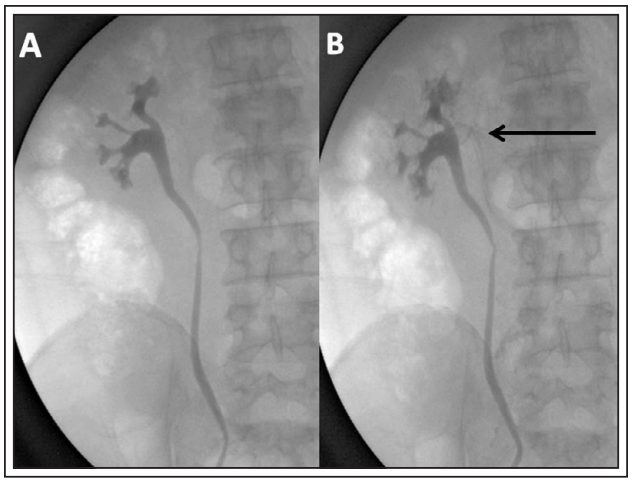

Figure 2. Retrograde pyelogram of the right collecting system. Panel A demonstrates the image just prior to pyelolymphatic backflow. Panel B demonstrates the abnormal connection between the collecting system and perirenal lymphatic channels (arrow), outline by cystograffin contrast.

unable to localize the fistula with flexible ureteroscopy. Given the absence of a grossly identifiable fistulous tract, we elected to place a ureteral stent and continue conservative management.

In addition to continued bladder drainage, the patient was started on a medium chain fatty acid diet. During the first postoperative week there was rapid improvement in the lymphorenal fistula as demonstrated by clearing of the urine and resolution of proteinuria. His foley catheter was removed and he was discharged home on postoperative day #8. He continued his medium chain fatty acid diet until his 10 week follow up. At that time there continued to be complete resolution of his proteinuria and therefore his right ureteral stent was removed. There was no evidence of recurrent proteinuria or chyluria at a 6 month follow up.

Discussion

Chyluria is an uncommon clinical condition outside of the tropics, characterized by an abnormal communication between lymphatics and the renal collecting system. The most common cause worldwide is chronic filariasis, during which the death of the parasite results in a granulomatous reaction and obliteration of the involved lymphatics.[3] In developed countries, infectious etiology is rare, with the most common causes being prior surgery and neoplasms such as renal angiomyolipomas, lymphangiomas of the kidney and bladder, and metastatic testicular cancer.[3,4]

Reported presenting symptoms include milky urine in up to 70% of patients, as well as recurrent urinary tract infection, urgency, frequency, or urinary retention.[7] The diagnosis is generally made clinically, however, the presence of triglycerides and high urine albumin levels will aid in the decision making process.[7] Lymphangiography has been regarded as the most powerful preoperative imaging modality to localize the fistulous connection, however it is invasive and not routinely done.[7] Conversely, lymphoscintigraphy is a noninvasive and safe technique that may be useful in localizing the site of the fistula.[7]

The degree of chyluria can be graded as mild, moderate, or severe. Mild disease will have intermittently milky urine without clot colic, urinary retention, or weight loss.[7] This intermittency is generally associated with a fatty meal and then the milky urine may not be visualized when fasting.[2] Moderate chyluria will have intermittent to continuous milky urine with occasional clot colic, however no weight loss or urinary retention. As demonstrated in our case, the most severe grade of chyluria is characterized by continuously milky urine with clot colic or urinary retention and possible weight loss.[7] If the chyluria is prolonged, the continuous loss of proteins, fats, and lymphocytes may result in malnutrition, immunodeficiency, and hypercoagulability.[2] Fortunately in this case, the chyluria was acute in duration and there was no evidence of malnutrition at the time of his presentation.

There is a wide range of treatment options for chyluria. Initially, conservative management with watchful waiting or a diet with high protein and restricted to only medium chain fatty acids may be used.[3,4,7] Octreotide has also been described as a successful conservative management option in one case report.[8] However, as reviewed by Deso et al, the average time for chyluria to resolve with watchful waiting has been reported up to 44 months. If conservative measures fail or if the degree of chyluria is severe enough to warrant more intervention, sclerotherapy with either dextrose, silver nitrate, or povidone iodine have had some success.[9] Nandy et al reported an 87% success rate after instilling a povidone iodine and dextrose solution for 3 days in patients who had failed initial conservative treatment.[9] The most invasive management includes open, laparoscopic, or retroperitoneoscopic renal pedicle lymphatic disconnection. Success rates with these techniques have been reported up to 99%.[7,10] As reviewed by Sharma and Hemal, in patients who would not tolerate the most invasive procedures, a lymphovenous anastomosis may be attempted.[7] This is done using microsurgical technique to anastomose inguinal or lower extremity lymphatics to corresponding veins, or by creating an end-to-side anastomosis between an inguinal lymph node and a tributary of the saphenous vein.[7] Finally, in some cases of intractable chyluria, TPN with enteric rest may also be employed.[7]

We present a case of severe grade chyluria that was attributed to recent blunt force trauma leading to the formation of a lymphorenal fistula. It was concluded that the traumatic force leading to the L1 compression fracture also disrupted the lymphatics near that level, leading to the fistula. This is a rarely reported event, as we found only one other case report of blunt force trauma to the flank resulting in chyluria 6 months after that traumatic event.[8] It is unclear whether the contrast dye used for the retrograde pyelogram may have provided a form of sclerotherapy, however, our patient was ultimately managed successfully via conservative endoscopic and dietary treatment. □

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