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Case Report

Neglected staghorn calculus presenting with perinephric abscess and discharging lumbar sinus-a case report

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Abstract: Perinephric abscess secondary to renal stones is a rare entity. Presenting with a cutaneous sinus is even rarer. To the best of our knowledge, there are only 6 cases of staghorn calculus presenting as discharging sinus. This report highlights the importance of early detection of renal calculi especially staghorn types and their earliest possible intervention. It also emphasizes the need for clinical suspicion of any intra abdominal pathology as the cause of sinus formation.
Keywords: Perinephric abscess, Sinus, Staghorn calculus, Nephrolithiasis, Percutaneous nephrolithotomy

INTRODUCTION:

Renal stones often present as acute colic pain in the emergency wards**.** According to the Medline search, there are only 6 cases of staghorn calculus presenting as subcutaneous abscess secondary to a perinephric abscess [1-6]. Staghorn calculi are relatively uncommon, accounting for 11% of nephrolithiasis cases. Patients classically present with recurrent pyelonephritis, cystitis-like urinary symptoms, persistent flank pain, renal colic or haematuria. Fistulous communication to adjacent bowel loops, duodenum, stomach, lungs and pleura may be seen as complication and are not as rare as discharging lumbar sinus. Once indentified it should be treated at the earliest to prevent end stage renal disease or uro-sepsis.

CASE REPORT:

A 32-year-old female patient presented to the outpatient department with a sinus on the left lumbar region associated with foul smelling discharge and secondary wound infection for the past one month. It initially started as a subcutaneous swelling with mild tenderness five months back which was ignored by the patient. She has intermittent history of burning micturition for which she used to take oral antibiotics. She had no history of fever, pain abdomen and trauma to lumbar region. She had no significant medical or surgical history or any prior history of hospitalisation.

On examination, she looked malnourished with poor general condition. She was afebrile with pulse rate of 98/min, blood pressure of 120/70 mm Hg, arterial oxygen saturation of 98% on room air, and random blood glucose 125mg/dl. Her abdomen was soft and nontender. There was a soft fluctuant swelling of 3×2 cm on left lumbar region with discharging sinus. (FIG 1)

Routine blood tests revealed anaemia (haemoglobin, 8.5g/dL), leukocytosis (13000/µl) and high ESR (60 mm/hr) with normal serum urea and creatinine. Urine analysis showed high pus cells with a trace of blood. E. coli was isolated from urine and wound swab culture. Blood culture was negative. Patient was started with broad spectrum antibiotics before culture sensitivity report came.

Routine USG of abdomen revealed a staghorn calculus in left kidney and a calculus in distal left ureter causing hydroureternephrosis. There was perinephric collection with internal debris communicating to the skin. (FIG 2A-C). Contrast enhanced CT scan well delineated the perinephric abscess (7×5 cm approximately) and its communication to the skin surface. It also confirmed the presence of left staghorn calculus and distal ureteric calculus. Left kidney showed reduced cortical enhancement as compared to the right. (FIG 3A-C)

After a week of antibiotics and two units of blood transfusion her general condition improved and she underwent percutaneous drainage of abscess

followed by removal of staghorn calculus by percutaneous lithotomy and double J catheter placement. The patient had an uneventful post-operative course.

Fig 1A: Discharging sinus with an infected wound in left lumbar region

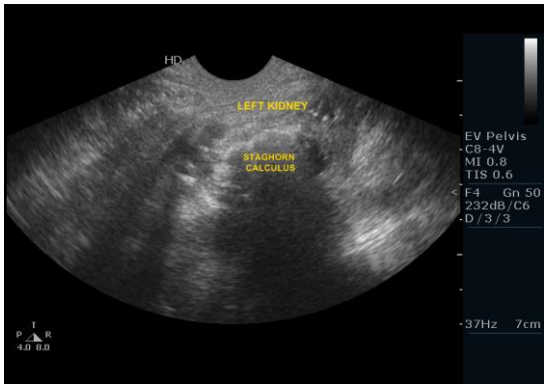

Fig 2A: Ultrasonography showing staghorn calculus in left kidney

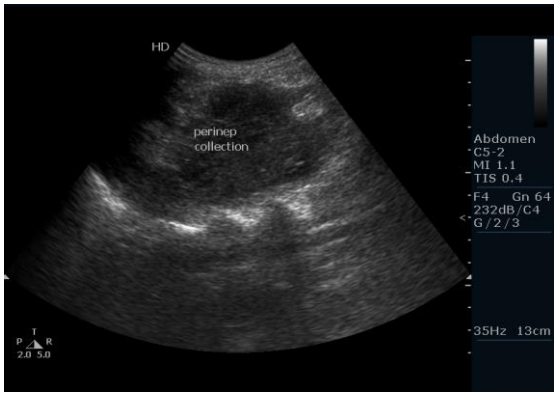

Fig 2B: Irregular hypoechoic area in the perinephric region (abscess).

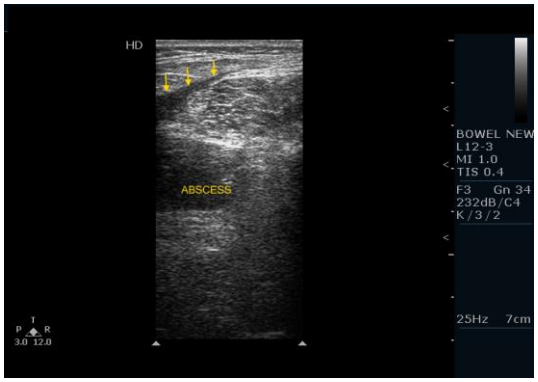

Fig 2C: A sinus tract (arrows) extending from the perinephric abscess toward the skin surface.

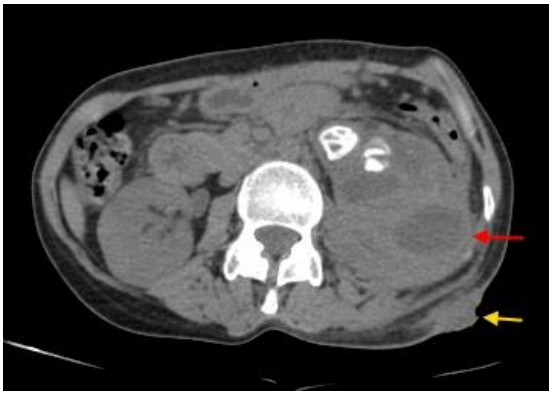

Fig 3A: Axial non -contrast CT showing left hydronephrosis with staghorn calculus and irregular renal contour. A hypo dense lesion (red arrow) noted in the left perinephric space indistinct from the psoas muscle. Note the subcutaneous swelling (yellow arrow).

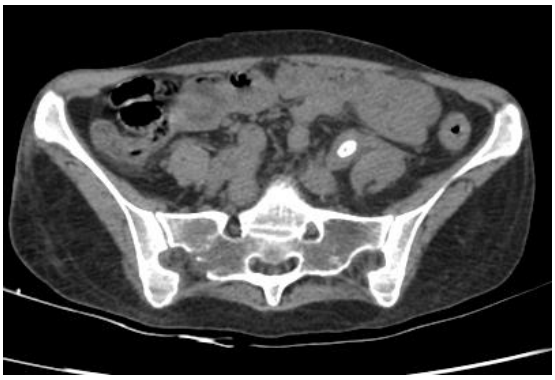

Fig 3B: Axial non-contrast CT showing left ureteric calculus.

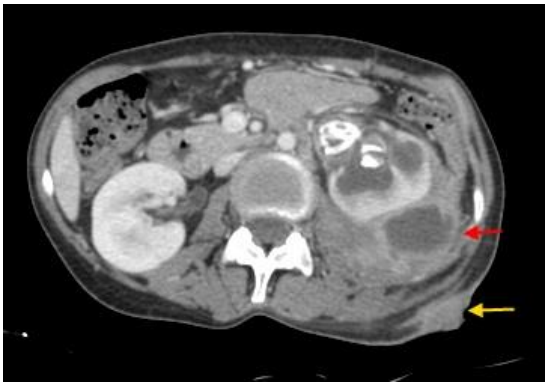

Fig 3C: Axial contrast-enhanced CT showing wall enhancement of the perinephric abscess (red arrow). There is decreased contrast enhancement of left renal cortex as compared to the right kidney. Also noted the subcutaneous abscess (yellow arrow).

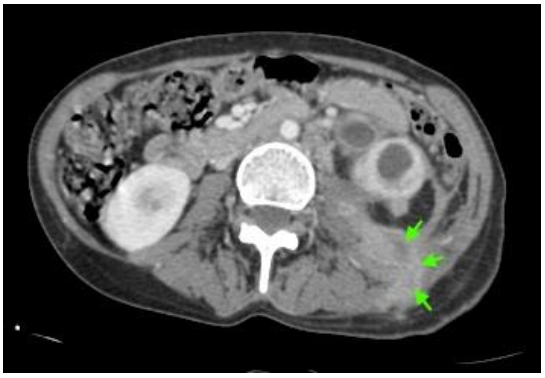

Fig 3D: Note the sinus tract (arrows)

DISCUSSION

Discharging sinuses resulting from perinephric abscess as the initial presentation of nephrolithiasis is uncommon. These communications arise in a background of conditions such as xantho granulomatous pyelonephritis, tuberculosis of the kidney, chronic stone disease, and post trauma or surgery. Fistulas between kidney and adjacent organs like the pleura, colon, small bowels, stomach and lungs are also uncommon but discharging as a lumbar sinus is very rare. Xantho granulomatous pyelonephritis was the most common cause, followed closely by tuberculosis of the kidney. Next leading cause was post surgery. However patients presenting with asymptomatic renal stone leading to spontaneous sinus tract is not so common [1-7]. In our case, the patient developed perinephric abscess secondary to a long standing undiagnosed staghorn calculus leading to a discharging sinus.

Composed of struvite (magnesium-ammonium phosphate), staghorn calculi are branched stones which grow progressively from simple calculus in the pelvis and fill into renal calyces. They are also known as infection stones as these crystals need the presence of certain bacteria which produce an enzyme called urease. More often these are found in women owning to the high degree of urinary infections in them. [8] The complications following it are pyelonephritis, Pyo nephrosis, perinephric abscess, sepsis and renal failure. Perinephric abscess may extend along the psoas muscle, pointing toward the groin, or more deeply into the perineum, vagina or scrotum [1-3]. Hence complete removal of the staghorn calculus should be attempted as soon as diagnosis is done. Retention of a part of the stone can lead to reformation of the staghorn type calculus. Hence caution should be exerted for the complete removal of the calculus.

Usually the initial step towards sinus tract formation is the formation of an abscess. However, it may not be the step in case of renal surgery or trauma, Perinephric abscess is defined as a collection of suppurative material in the perinephric space between Gerota's fascia and the renal capsule. The kidney being a retroperitoneal organ is directly related to the muscles posteriorly with perinephric fat and Gerota's fascia intervening in between them. Once these barriers are breached by any chronic pathology, surgery or trauma the abscess can spread along the path of least resistance, thereby presenting in the region of either the superior or inferior lumbar triangle or along the transversalis fascia to the posterior retroperitoneal space. The spread is usually caudal [1, 2]. However, in rare cases the spread can be cranial too forming nephrobronchial fistula. Furthermore, the infection may travel to the thoracic cavity via the weak area of lumbocostal trigone [2, 9].

Various risk factors include diabetes mellitus, previous urological surgery ,history of pyelonephritis, urinary calculi, renal or ureteric obstruction, and neurologic impairment (e.g., neurogenic bladder) [10,11] . The mean age of presentation is 51 years. Females are seen more affected than males. The most common presenting symptoms were fever, chills or diaphoresis, flank pain, abdominal pain, and nausea or vomiting .Fever was documented before diagnosis in 88**%** of patients. Other signs like abdominal mass or tenderness, and flank mass or tenderness were seen less frequently, and in about 11% of patients no signs could be found. Routine laboratory tests such as the white blood cell count and urinalysis are considered insensitive and non-specific for perinephric abscess [10]. Abdominal radiographs if done may be abnormal in about 60% of the cases and may show an absent psoas border, enlarged kidney, obliteration of the renal shadow, elevation of the diaphragm with associated pleural effusion, nephrolithiasis and retroperitoneal gas .With the easy availability and the improvements in the techniques of ultrasonography and computed tomography (CT), the diagnosis of perirenal abscess has become simpler. Though abdominal ultrasound is a useful and non-invasive imaging modality, it is false-negative in up to 36% of cases. Sonographic features of perinephric abscess include extension beyond the renal cortex with an irregular or lobulated border and longitudinal extension along the retroperitoneum.

Layering of internal debris or intra renal fluid collections may be seen within the abscess. CT is a more sensitive and specific technique for detecting renal abscesses. Ultrasonography could identify about 93% of abscesses whereas using CT, about 96% of the abscesses could be identified., CT clearly defines the abscess contents based on the hounsfeid units, provides information about the renal capsule and Gerota's fascia and allows precise delineation of small collections (1–2 cm) [12,13].

Once the diagnosis of staghorn calculus is made, prompt interventions must be taken to completely remove it. Medical treatment includes urease inhibitors like aceto hydroxamic acid and is only adjunctive in nature. Surgical treatment is definite and includes options like percutaneous nephrolithotomy, shock wave lithotripsy or a combination of both or open surgery according to American Urological Association guidelines. Percutaneous nephrolithotomy is the treatment of choice for staghorn calculus because of increased stone clearance rates compared to shock wave lithotripsy [14]. It is important to emphasize that kidneys are rendered non functional by a chronic infection/inflammation. Sinus communication to skin usually presents late in the course of illness unlike fistulas to other organs which present early in the course. Modern day urologists aim for sub radical management, yet such sinus tract deserves radical excision of the tract along with removal of the non functioning kidney. Leaving the sinus tract *in situ* may be a cause of recurrence and morbidity. Hence early intervention is utmost required to prevent morbidity and mortality [15]. Few exceptions exist to the radical management which include the tracts arising in an acute setting like trauma or surgery [16]. Such cases have been managed conservatively with good results.

CONCLUSION

Prompt and proper diagnosis of staghorn calculi should be followed by early surgical intervention to avoid long term morbidity and mortality. An underlying case of intra abdominal pathology must be kept in mind while treating any case of discharging sinuses.

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