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A Challenging Case of Staghorn Calculus in A Young Female

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Abstract

A 31-year-old female teacher presented to the emergency department with altered sensorium, hematuria, fever, abdominal pain, distension and acute breathlessness. She had a history of idiopathic intracranial hypertension (IIH) diagnosed two months earlier, treated with acetazolamide and recurrent abdominal pain managed with over-the-counter and alternative medications. On arrival, she showed signs of septic shock and respiratory dis-tress. Initial work up revealed severe metabolic acidosis, anemia, leukocytosis and acute kidney injury requiring hemodialysis. Imaging identified a staghorn calculus in the left kidney and a perinephric abscess in the right kid-ney. Initial measures were performed with intravenous fluids, inotropic support, mechanical ventilation and empirical antibiotics. The patient's condition improved dramatically after perinephric abscess drainage. Persis-tent symptoms prompted further imaging, revealing fistula formation and compromised renal function. Urosur-gery consultation led to partial nephrectomy. Cultures confirmed Escherichia coli as the causative agent. This case emphasizes the potential complications of untreated urinary tract infections and the importance of timely diagnostic imaging in preventing severe outcomes like nephrectomy. Additionally, it highlights the potential ex-acerbating role of steroid-containing medications (commonly used in the form of alternative medicines)in both IIH and sepsis.

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Key Words

Benign prostatic hypertrophy, ipss score, lower urinary tract symptoms, prostate size

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INTRODUCTION

A 31-year-old female teacher, was brought to the emergency department in altered sensorium. She had a history of hematuria, fever with chills, abdominal pain and distension of the abdomen for 5 days and acute onset breathlessness for 2 days.

Previous history of hospitalization 2 months ago for blurring of vision. She was diagnosed with Idiopathic intracranial hypertension based on MRI findings and chronic papilledema. Multiple lumbar punctures were performed for both therapeutic and diagnostic reasons. CSF analysis was within normal limits. The patient's visual symptoms resolved and she was discharged on Tab Acetazolamide.

Her husband also informed that the patient was having recurrent abdominal pain and multiple episodes of vomiting for which she was taking OTC drugs and alternative medication for a year. No details were available and no work up was done by the prescribing practitioner.

Course in Hospital: The patient presented to the emergency department in an altered sensorium with PR-108 bpm, BP-70/40 mmHg, RR-30 cpm and SpO2-80% on RA.

On physical examination, generalized abdominal tenderness and guarding were present along with sluggish bowel sounds. She had respiratory distress with decreased air entry bilaterally. No focal neurological deficits. These findings pointed towards a provisional diagnosis of Shock, probably due to sepsis with a septic focus in gastrointestinal or genitourinary systems.

The patient was immediately started on intravenous fluids and inotropic support along with empirical broad-spectrum antibiotics. She was intubated due to a poor GCS score and started on invasive mechanical ventilation. Arterial blood gas analysis showed severe metabolic acidosis with pH: 7.03, HCO3-: 8 pCO2: 28 pO2: 88.

Routine investigations along with a tropical fever panel, viral panel, urinalysis and blood and urine cultures were sent. Chest X-ray was normal.

An urgent ultrasound was performed which revealed a staghorn calculus in the left kidney along with a perinephric collection in the right kidney. The findings were also confirmed with a CT scan.

Initial complete blood count showed anemia (Hb-8.4), leukocytosis (WBC count-24,000 cells/mm3) and thrombocytosis (Platelets-5,38,000). Serum creatinine was 4.5 and Blood urea was 119. Urine output was noted to be low. So she underwent urgent hemodialysis for AKI.

Serum sodium was 135 and Serum Potassium was 3.1. Prothrombin time was 18.9 and INR was 1.7. She was transfused with 12 units of FFP and 3 units of PCV to stabilize her.

For her altered sensorium, repeat CSF analysis was planned. An autoimmune panel was also sent keeping in mind her previous history of Idiopathic intracranial hypertension.

Routine CSF analysis was insignificant except for an IgG positive for HSV 1 and 2. (Probably False positive) Samples were also sent for ANA-Weak positive., Anti-thyroid peroxidase antibody-1.37 IU/ml (Negative)., Anti-phospholipid antibody-Negative Procalcitonin was 8.2 ng/L., D-dimer-7.57 microgram/ml
Amylase-22 U/L., Lipase-68 U/L

After initial stabilization on day 2 of hospitalization, 200 ml of the perinephric collection was drained under USG guidance which showed dramatic improvement in the patient's condition. The fluid was sent for analysis and repeated drainage of fluid was performed over the next few days using a pigtail catheter as there was repeat collection. The patient started becoming more vitally stable and her condition was improving.

Patient underwent 3 cycles of dialysis to improve her renal function.

Cultures came back positive for E coli and antibiotics were tailored accordingly.

Despite clinical improvement, the drain output was not reduced. CECT was performed after Renal function tests came back normal. Her scan was suggestive of fistula formation.

A DTPA scan was done which showed that the parenchymal function was markedly compromised in the left kidney which was suggestive of an obstructed collecting system. The left kidney contributed to 74.5% of the kidney function while the right kidney contributed-25% of it.

Urosurgery was consulted for the removal of staghorn calculus which led to partial nephrectomy of the right kidney.

Final Diagnosis: Septic shock due to perinephric abscess in the right kidney along with left staghorn calculus in a known case of Idiopathic Intracranial Hypertension.

RESULTS AND DISCUSSION

The patient was having abdominal pain for over a year for which she was taking alternative and OTC

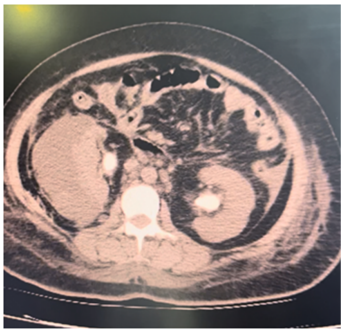

Fig. 1:ct scan demonstrating calculus in kidney

medication. Many times, these medications tend to contain steroids and analgesics which, although they do lead to instant relief of symptoms, can also have detrimental effects on the body. The effects of the medication on this particular patient were two-fold. To begin with, the chronic abdominal pain she was experiencing for a year can be attributed to chronic UTI based on her history, physical examination and lab results. In cases with staghorn calculus, Proteus is a commonly found organism in urine cultures that produces the enzyme urease, which can reduce the acidity of the urine, allowing stones to form. Once stone formation begins, bacteria can sequester within the stone, making it less susceptible to antibiotic treatment (Harris and Burrell, 2013). However, we recovered E. coli in our culture report which also leads to recurrent UTI and may predispose to stone formation (Lavallée *et al.,* 2015). Since her infection never resolved, the stones most likely kept depositing until a staghorn calculus formed which could have caused an increase in the abdominal pain and formation of perinephric abscess. There's a high probability that she might be consuming steroids or heavy metals in the form of alternative medication, details of which are not available. According to recent literature, steroid use can also play a part in the development of idiopathic intracranial hypertension and sepsis (Gardiner *et al.,* 2011., Winoker *et al.,* 2020., Rohit *et al.,* 2021., Liu *et al.,* 2022., Chowdhury and Cozma, 2020). This explains the patient's chronic papilledema which eventually leads to blurring of vision. The anti-inflammatory effects of steroids can make the signs and symptoms of sepsis go unnoticed (Mahmoud and Senousy, 2018). Timely intervention such as an abdominal ultrasound performed during the initial phase of the disease for the abdominal pain could have led to an earlier diagnosis and prompt treatment which might have eliminated the need for a nephrectomy and prolonged hospital stay (Lee *et al.,* 2016., Matthews and Lancaster, 2011)

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