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Bedside Ultrasound in the Emergency Department Enables Rapid Diagnosis of PUJ Obstruction Syndrome

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Abstract

Presentation

A 27-year-old male presented to the Emergency Department with acute severe left flank pain following ingestion of 5 pints of beer. Approximately 20 bouts of similar episodes over the past year, in the setting of alcohol ingestion. Despite attending GP, no diagnosis reached yet.

Diagnosis

"Pelvo-ureteric junction (PUJ) obstruction Syndrome". Bedside ultrasound in the Emergency Department during the acute pain crisis: massive hydronephrosis left kidney. Finding confirmed on CT scan. Subsequent 99m-Tec renogram showed markedly decreased renal function on the left.

Treatment

Interval Pyeloplasty two months later.

Conclusion

Delayed recognition is the norm for PUJ obstruction syndrome, as CT/MRI/US studies often do not display hydronephrosis if the patient is asymptomatic. We could not find any reports in the literature of diagnosing PUJ obstruction syndrome using bedside ultrasound in the Emergency Department.
We advise acquiring rapid bedside ultrasound imaging in suspected cases of PUJ obstruction syndrome, enabling earlier diagnosis.

Introduction

Pelvo-ureteric (PUJ) obstruction syndrome is a difficult diagnosis to make, as imaging studies are often normal by the time the pain has resolved. This can lead to delayed recognition. The key to timely diagnosis is obtaining appropriate imaging during an acute pain crisis.[1]

Case Report

A 27-year-old male presented to the Emergency Department with acute severe left flank pain following ingestion of 5 pints of beer. He reported approximately 20 bouts of similar painful episodes over the past year, in the setting of alcohol ingestion. These would usually resolve within a few hours. He had recently attended his GP, when not in acute pain; his GP was unable to find any abnormality on physical examination.

His medical history included an episode of left-sided epididymo-orchitis 2 months previously, which resolved with antibiotic treatment.

Clinical examination was unremarkable, as were renal function blood tests, inflammatory markers, and mid-stream urine analysis.

Point-of-care ultrasound (POCUS) performed in the Emergency Department revealed massive left-sided hydronephrosis (figure 1). This prompted a CT urogram to evaluate the level of ureteric obstruction. Hydronephrosis was confirmed on CT imaging (figure 2). The left renal pelvis was markedly dilated, while the ureter was decompressed. No obstructive stone or growth were seen to account for this; the diagnosis was pelvo-ureteric junction obstruction syndrome.

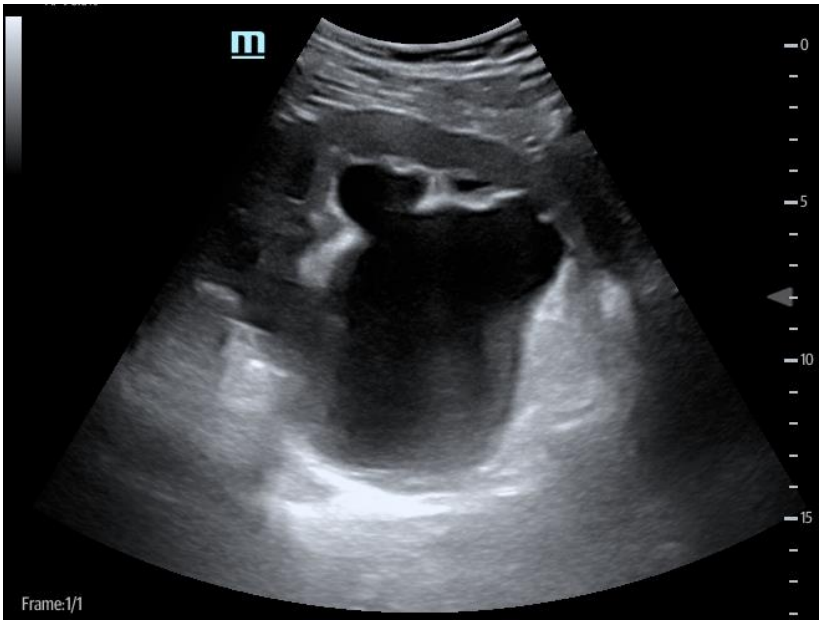

Figure 1: POCUS shows severe left hydronephrosis - hypoechoic area centrally in the renal pelvis with thinning of the renal cortex peripherally. There is no calculus seen.

Figure 2: CT scan: renal pelvis hugely distended, no stone/growth seen: PUJ obstruction syndrome.

Discussion

Delayed recognition is the norm for PUJ obstruction syndrome, as CT/MRI/US studies often do not display hydronephrosis if the patient is asymptomatic[1]. A major benefit of bedside ultrasound performed in the Emergency Department is timeliness of the examination; a suggestive clinical examination and bedside ultrasound facilitated a more informed discussion with radiology and acquisition of rapid CT imaging while symptomatic.

Point-of-care ultrasound (POCUS) is becoming increasingly well-established in the Emergency Department. It is increasingly seen as a mandatory skill for Emergency Physicians and is compulsory in emergency medicine residency training programmes in the USA (2). POCUS has shown high sensitivity and specificity for the detection of hydronephrosis when compared with CT[3].

PUJ syndrome is defined as a partial or intermittent obstruction of the flow of urine from the renal pelvis to the proximal ureter, without an obvious causative lesion[4].

Common causes include an aberrant renal vessel causing external compression of the lower pole of the kidney ('Dietl's Crisis'), or intrinsic malformation of a segment of the proximal ureter. Less frequent aetiologies include higher insertion of the ureter or a polyp. Although more commonly discovered during childhood, some cases do not become symptomatic until adulthood and present with a classical history of alcohol-induced pain.

PUJ obstruction syndrome can be treated surgically with pyeloplasty, nephrectomy and percutaneous nephrostomy placement.[5]

Our patient proceeded to have a 99m-Tec renogram showing markedly decreased renal function on the left. Pyelopasty was performed.

In conclusion, in patients with a history of recurrent flank pain following fluid consumption, suggestive of PUJ obstruction, who present acutely to an ED with same, renal ultrasound should be considered on a rule-in basis if an appropriately trained EM physician is available. In the absence of such a physician or absence of hydronephrosis, further investigation is required as the diagnosis is not entirely excluded.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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