

Foreign body in the kidney: an unusual case and its management

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Encountering a foreign body (FB) in the kidney is uncommon. Most of the time a FB is introduced externally (violence or accident) or through endourological interventions. An ingested FB reaching the kidneys is extremely rare. This article includes an interesting case of FB, which apparently reached the kidney through the gastrointestinal tract as well as a brief review of the relevant literature. The case was successfully managed laparoscopically.

Key Words: foreign body ◊ kidney

CASE REPORT

Our case is of a 33 year old male who was referred to our hospital in July 2011 with the diagnosis of bilateral autosomal dominant polycystic kidney disease (ADPKD), bilateral urolithiasis, foreign body in left kidney and a follow up case of acute viral hepatitis.

History of his disease dates back to February 2010 when he was admitted with acute viral hepatitis and managed conservatively at a tertiary care institute. During an evaluation, multiple bilateral renal, ureteric and bladder stones with bilateral ADPKD were detected in the patient. He underwent multiple endourological procedures over the period of six months in the form of cystolithotripsy (CLT), right uretero-rensoscopic (URS) stone clearance, left URS followed by bilateral ureteric stenting; however, the stones were only partially cleared.

Subsequently, both ureteric stents were removed (October 2010) and multiple sessions of bilateral extracorporeal shock wave lithotripsy (SWL) was performed for clearance of residual stones. The patient was comfortable and discharged with few small residual calculi. He presented to the same medical cen-

ter with colicky left flank pain and dysuria in June 2011 with no symptoms of gastrointestinal disturbance and no abnormality upon examination of the abdomen. A plain X-ray showed bilateral residual calculi with a linear radio opaque shadow in the left renal area (Figure 1). This radio opaque shadow was considered to be a foreign body (FB), supposedly a piece of guide wire or ureteric stent in the left upper ureter resulting from the previous urological interventions. A CT scan was performed to delineate the exact anatomical location of the FB and stones in relation to the left upper ureter and pelvicalyceal system (Figure 2). The patient was taken up for left URS and no foreign body was identified in the left ureter or pelvis.

At this stage, he was referred to our center for management. We further evaluated the patient with MR urography that confirmed the presence of a foreign body, which was lying obliquely in relation to the left upper ureter. The lateral two thirds of this FB seemed to be embedded in the lower pole of the left kidney (Figure 3).

We performed a transperitoneal laparoscopic exploration with the aim of removing the FB. A metal-



Figure 1. Plain X-ray showed bilateral residual calculi with a linear radio opaque shadow in left renal area.



Figure 2. CT scan showing the foreign body in relation to left upper ureter and pelvicalyceal system and a calculus.

lic linear FB was found at the lower pole of the left kidney with the lateral two thirds being embedded in the renal parenchyma at the medial aspect of the lower pole. Carefully, the foreign body was removed via laparoscopic intervention.

To our surprise, the foreign body was a 4.5-centimeter long malleable copper wire (Figure 4) similar to the one found in electric cables. Post-operative recovery was uneventful and the patient was observed and discharged on the fifth postoperative day. We specifically inquired from the patient and his family



Figure 3. MRU confirmed the obliquely lying foreign body in relation to the lower pole of left kidney.



Figure 4. Laparoscopically removed foreign body from lower pole of left kidney was a 4.5 centimeter long malleable copper wire.

about any past history of ingestion of such a wire, including during childhood, but none was available except that his father was an electrician.

DISCUSSION

Foreign bodies in the kidney and renal pelvis have rarely been reported. These may be overlooked and can cause harm to the patient. Foreign bodies may reach the kidney by one of three routes: by means of external violence, through the urethra, bladder, and ureters and from the gastrointestinal tract following ingestion [1].

The majority of foreign objects directly reaching the kidney are a result of penetrating objects, in the form of bullets, shell fragments and explosion debris. Needles and postoperative drains are also included in this category. It is known that a foreign body may be introduced through the urethra during an operative procedure or as an erotogenic act by a mentally disturbed patient. A less frequent but more bizarre route can be taken by the foreign body that is swallowed and eventually perforates the intestinal wall at the second / third portion of the duodenum [1].

The source of the foreign body in our case and how it reached the left kidney was a puzzle. Inquiries to previous operating surgeons and documents were unable to identify the introduction of any objects externally or through the urethra during a endourological procedure. For the third route, we enquired from the patient and his parents about the possibility of ingestion of a foreign body in the past including childhood but they were unaware any such incident. It is possible that, since the patient's father was an electrician, he could have ingested a piece of wire unknowingly while playing during childhood. Further evidence supporting that it was an ingested foreign body and not an endo-urologically introduced object is that gradually it migrated from the medial (vertebra) to the lateral side towards the kidney. Had it been endo-urologically introduced, it would migrate from the outside towards kidney. Also, it was present on X-rays when the patient was first admitted.

We reviewed the literature and could only find two case reports in the indexed literature where the ingested foreign body perforated the gut wall and eventually found its way to the kidney. In the first case, a four year female child presented with fever and flank pain with history of ingestion of a sewing needle about a week prior [2]. She had developed frank pyonephrosis and her kidney could not be salvaged. In the second case, a 75-year-old man was admitted with right upper abdominal pain persisting for 7 days. The patient had consumed fish one day before the onset of abdominal pain. Computed tomography revealed a linear object of high intensity that had penetrated the duodenum and migrated into the right renal vein producing

thrombosis of the renal vein [3]. Because the foreign body could not be removed without seriously injuring the right renal vein, a right nephrectomy was performed.

The ingestion of foreign bodies is common, and most small objects pass through the GI tract uneventfully within 1 week [3]. Perforation of the GI tract is rare, occurring in less than 1% of patients and peritonism may not always be present [4]. In one large series of 321 cases where perforating foreign bodies were reported, only 43 were found extraluminally [5].

Although rare, gastrointestinal perforations due to ingested foreign bodies can occur and any part of the gastrointestinal tract may be implicated. The most common site of involvement is the third part of the duodenum (70%) [1]. It is presumed that this due to the relatively fixed position of the third portion of the duodenum with the superior mesenteric vessels anteriorly and the aorta posteriorly [6].

Symptoms can vary from mild gastric pain to signs of peritonitis. For symptomatic patients, surgical intervention is required while only observation is recommended for asymptomatic patients with no complications [7].

Our case is unusual in that it is the third case to be reported besides the two published in the indexed English literature. In our case, though there is no available history of ingestion of any foreign body in the past, the same cannot be entirely ruled out. A thick malleable metallic copper wire as seen in the picture (Figure 3) is akin to the component wires commonly found in power cables and is not a component of any of the commonly used urological equipment. Therefore, it can hypothetically be stated that a foreign body accidentally ingested in the past during childhood or later, perforated the G I tract and slowly migrated from left to right with the peristaltic movements of the third part of duodenum. This region has been identified as being the most common part to be perforated [1]. The same movement apparently led to penetration of the renal parenchyma. It is also surprising that, if it did occur as hypothesized, the perforation did not produce any complications that accompany such an incident and simply led to the penetration of the kidney. Creditably, it was successfully managed by laparoscopic removal without complications.

CONCLUSIONS

High suspicion, early diagnosis and prompt treatment are important in the management of a foreign body in urological practice. Laparoscopy, though challenging, is an effective technique for abdominal and retroperitoneal exploration.

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