Case Report

PCNL Associated Splenic Injury with a Novel Management Approach

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Abstract

Percutaneous nephrolithotomy (PCNL) is a common urological procedure for the treatment of renal pelvis and upper ureteric stones. It is associated with a number of different complications which can be broadly divided into access and nephrolithotomy related complications. Whilst reported, splenic injury is an unusual and rare complication. We describe the management of a trans-splenic access associated injury and in particular, the role of a combined urological and radiological approach to managing this unusual complication.

ABBREVIATIONS

PCNL: Percutaneous Nephrolithotomy

CASE PRESENTATION

A healthy 58 year old man, attended hospital for a left PCNL in order to treat a 2.2cm left renal pelvis stone, associated with a 7mm left interpolar calculus, and a 1cm left lower pole stone (Figure 1).

With the intention of targeting the stone bearing interpolar calyx calculus, a single infra-12th rib puncture was performed. Track dilation to accommodate a 30Ch Amplatz sheath was completed without immediate complication and the PCNL procedure was completed without any immediate recognised complications. A nephrogram performed at Day 2 post-procedure suggested the possibility of a distal ureteric fragment and so the patient was discharged, as per normal practice, to return for a further repeat nephrogram 4 days later.

Six days post-op the patient was admitted in the A&E department after a collapse, with symptoms of lethargy, lightheadedness and feeling generally unwell. Although not tachycardic (pulse: 70bpm), the patient was noted to be hypotensive (BP: 80/50) Initial blood tests demonstrated a significant anaemia (Hb: 8.3g/dl) and the patient was resuscitated with intravascular fluids, including transfusions with both red cells and fresh frozen plasma. The patient was transferred to the High Dependency Unit and a CT Urogram was performed. This demonstrated the nephrostomy tube passing through the inferior tail of the spleen and a significant associated peri-splenic haematoma (Figure 2). There were no signs of active arterial

haemorrhage on imaging and the patient remained stable after the initial resuscitation.

The following day, the patient was taken to theatre for a left retrograde JJ ureteric stent insertion. Having successfully completed this, the patient underwent removal of the nephrostomy and immediate angiogram of the splenic vasculature. Although no evidence of arterial haemorrhage was observed, prophylactic embolization of the tail of the spleen was completed to prevent any further bleeding (Figure 3).

A further USS performed two days later confirmed a stable haematoma, whilst antibiotic treatment was initiated to treat a concurrent pneumonia.

DISCUSSION

Rates of major PCNL complications vary in different studies but range between 1-7% [1]. Access related complications typically involve bleeding (with transfusion rates of <1%), pneumothorax or visceral injury [1]. Of the intraperitoneal injuries, colonic perforation (0.2-0.8%) is the most common but injuries to the spleen, liver and duodenum have all been described [2,3].

Splenic injuries may present with a range of symptoms depending on the degree of haemodynamic instability and that correlates greatly with the extent of the injury. Suspicion of an access injury should arise if there is evidence of excessive intra-operative blood loss, and persistent or disproportionate abdominal pain. The risk of splenic injury varies depending upon the site of access. According to a study by Hopper and Yakes (1990), in which they assessed prone and supine CT scans, the risk of splenic injury during PCNL was described to be highly unlikely if a 11th or 12th rib sub costal approach was completed during expiration. However, this risk was thought to increase to 13% if this approach is taken on inspiration [4].

Historically, the recommended management of an intra-operative splenic injury was that of emergency laparotomy and splenectomy which is still advocated by some urologists [5]. However, there is no true consensus on the modern management of PCNL-induced splenic injury [6]. Öztürk (2014) in his review of the available literature suggested that a non-operative approach may be pursued in haemodynamically stable patients, with bed rest and close monitoring with a prolonged use of a ureteric stent and delayed removal of the nephrostomy drainage catheters. In some instances the placement of large bore catheters through the nephrostomy have been successful in tamponading the bleeding and thus avoiding the need for further intervention. There have also been some good results reported with the use of collagen-thrombin haemostatic sealant [7] or Gelfoam® [8] to prevent further bleeding after the nephrostomy removal.

Radiologically guided arterial embolization is a management method that has gained momentum in recent years for the management of splenic and hepatic injuries both as a result of trauma or intra operative complications. In our case study the removal of the nephrostomy and the embolization was performed in theater after the insertion of the antegrade JJ ureteric stent despite no evidence of active bleeding.

After our experience we propose that for patients with evidence of active bleeding on computerized tomography or any degree of haemodynamic instability such as tachycardia (HR>90), hypotension (MAP<65) or dropping haemoglobin on laboratory testing, angiography should be undertaken with the view of selectively embolising the site of injury after removal of the nephrostomy drainage tube. We recommend that this procedure is performed in the operating theater with a urologist present to in order to have the capacity to proceed with an open procedure if the embolization fails.

REFERENCES