Case Report

Journal Of Clinical & Medical Images Case Reports

Open Access, Volume - 2

Iatrogenic Segmental Renal Artery Pseudoaneurysm: A Case Report

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Received Date : Aug 22, 2022
Accepted Date : Sep 15, 2022
Published Date : Sep 26, 2022
Archived : www.jcmimagescasereports.org

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Introduction

Pseudoaneurysm is a false aneurysm that occur at the site of arterial injury that involves one or more layers of the arterial wall but no all three layers of the wall [1]. The renal artery pseudoaneurysm is a rare clinical entity due to iatrogenic procedures like percutaneous procedures, renal biopsy, nephrectomy or to penetrating or blunt traumas [2,3]. The clinical can be different according to patient blood pressure, blood flow and also to the effectiveness of the hemostasis. This complication can lead to hematuria, blood loss, and even hemorrhagic shock secondary to rupture (rare event but with a mortality rate as high as 80%) [4]. Aneurysms larger than 2 cm in diameter are considered to have a high risk of rupture, although ruptures have also been reported in smaller aneurysm [5].

Case Report

We present the case of a 56-year-old female patient admitted to the orthopedic department for scoliosis and undergoing L3 - L4 arthrodesis surgery. The operation was interrupted due to bleeding on the left flack side and the thoracic surgeon was urgently called to evaluate the presence of trauma to the diaphragm and mediastinum. Despite the thoracic evaluation, the patient continued to have hemoglobin loss and worsening of renal function indices (Hemoglobin 7 gr/dL from 10 gr/dL; Creatinine 1.50 mg/dL from 0.80 mg/dL; Azotemia 55 mg/dL from 31 mg/dL). For these reasons a CT scan of the abdomen and pelvis with contrast was performed. On baseline examination there was total edematous imbibition of the left peri-renal fat. After injection of iodinated contrast, a meso-renal fracture was found at the level of the upper pole. Finally, during late urographic scans at 5 and 15 minutes, the contrast was observed to spread from the upper renal calyces to the posterior renal space, forming a urinoma (**Figure 1,2**). The patient immediately underwent endoscopic surgery for placement of mono-j ureteral stent and bladder catheter with drainage of clots at bladder level. The next CT scan after six days documented reduced contrast leakage at the level of the left upper pole renal laceration, almost complete resorption of the urinoma, and the distal end of the ureteral stent correctly positioned near the upper calyces (**Figure 3**). Nevertheless, blood loss and gross hematuria persisted the next day, so it was decided to perform angiography.

Figure 1: *Tac showing meso-renal fracture at the level of the left upper pole.*

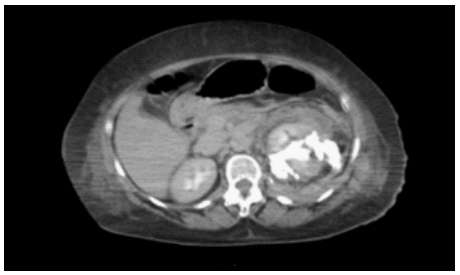

Figure 2: *Tac showing a urinoma.*

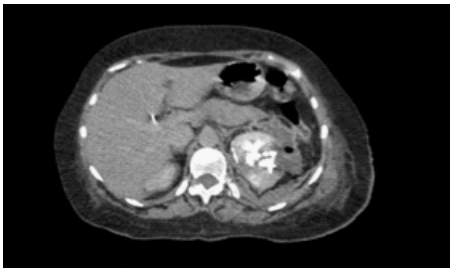

Figure 3: *Tomography situation after 6 days with a double j uretheral stent.*

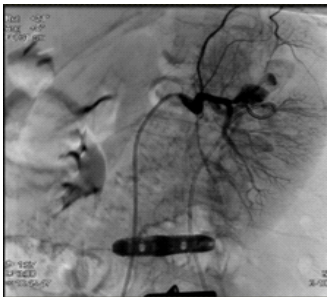

Figure 4: *2 Pseudoaneurysms in correspondence of the superior and mesorenal renal pole.*

Citation: Lorenzo Capone, Giovanni Ciccarese, Antonio Cisternino. Iatrogenic Segmental Renal Artery Pseudoaneurysm: A Case Report. J Clin Med Img Case Rep. 2022; 2(5): 1241.

Angiography was performed using a right transfemoral arterial approach with study of the abdominal aorta, selective catheterization of the left renal artery, and super selective intraparenchymal branches of the middle and upper renal pole using a microcatheter under anesthesia care. The examination revealed the presence of two spreads of constraint of the renal parenchyma compatible with pseudoaneurysms in correspondence of the superior and mesorenal renal pole, both less than 2 centimeters (**Figure 4**). Finally, embolization of the arterial branches afferent to the lesions was performed by positioning metal coils with controlled release (3 at the upper pole: 2 x 70 mm and 1 x 70 mm; 2 at the mesorenal level of 3 x 70 mm) (**Figure 5,6**). In the days following the embolization there was a rise in hemoglobin, the complete disappearance of hematuria and a normalization of the indexes of phlogosis.

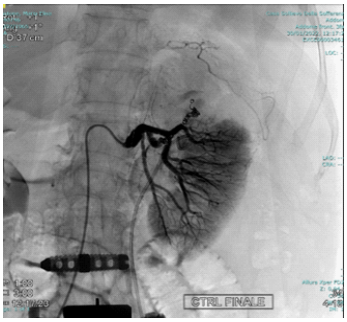

Figure 5: *Coil embolization.*

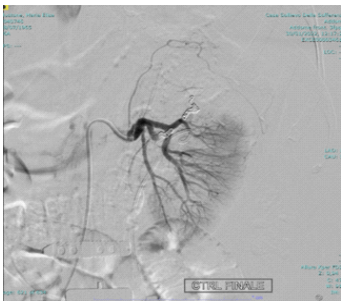

Figure 6: *Coil embolization.*

Discussion

A true aneurysm is a circumscribed dilatation of an artery that is surrounded by the intima, media, and adventitia. A pseudoaneurysm, by contrast, forms as a result of an injury to one or more layers of the arterial wall [1,2,6]. These vascular lesions are generally related to renal biopsy, nephrectomy, renal transplantation, or percutaneous procedures. In addition, there is a re¬lationship with penetrating traumas and, more rarely, with blunt traumas (the mechanism of sudden decel¬eration in automobile accidents is the most probable cause) [2,3,7]. Renal artery pseudoaneurysm is a rare but serious condition because it involves an arterial perforation that is occluded only by hematoma and connective tissue with a high propensity for rupture [4,5]. A controlled bleed, in fact, can become a life-threatening hemorrhage if the balance between the tamponade effect of the surrounding hematoma and connective tissue, and the intraluminal hydrostatic pressure changes [8]. When there is rupture, there are four spaces the blood can be redistributed: retroperitoneal, intraperitoneal, intrarenal, and intrapelvic; fortunately most intraparenchymal renal artery pseudoaneurysm ruptures are self-contained. Symptoms may include abdominal tenderness, abdominal mass, hematuria, hypertension until shock. In renal artery pseudoaneurysm hematuria is the most common symptom because of the pseudoa¬neurysm erosion to the adjacent renal collection system. This situation can lead to worsening of kidney function, anuria and dialysis [6,7,9].

Diagnosis of renal pseudoaneurysm can be complicated by a lack of specific clinical signs and symptoms or by a failure to identify potential mechanisms of arterial injury. When the patient is hemodynamically stable, the non-invasive examinations of choice are doppler ultrasound, computer tomography, and magnetic resonance imaging. Early detection and treatment of renal pseudoaneurysm is important to avoid potential morbidity from this condition [6].

Treatment of renal pseudoaneurysm consists of nephrectomy, open vascular surgery, or angiographic embolization, depending on the patient's clinical condition. Angioembolization is the currently accepted first line therapy for renal pseudoaneurysms because of its greater success rate of up to 80% and lower complication rate compared to those of surgical approaches [5,6]. If interventional radiology is not available or if substantial delay in getting a patient to angiography is expected, surgery is the alternative (evacuation and closure of the arterial defect, or evacuation and ligation of the offending artery) [10,11]. There are no established protocols for post-treatment follow-up of patients who have undergone selective angioembolization, but it is, however, generally accepted among experts that the patient should be closely monitored by both laboratory and first and second level diagnostic tests, 24 hours apart, one week and then one month after surgery [5,11].

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