



EMERGENCY CONTROL OF EXPANDING PERINEPHRIC HEMATOMA BY PERCUTANEOUS THROMBIN AND CYANOACRYLATE GLUE INJECTION IN A POST RENAL BIOPSY RENAL POLAR ARTERY PSEUDOANEURYSM

Medical Science

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ABSTRACT

We report a case of a 70-year old male patient who presented with expanding perinephric hematoma and hemodynamic compromise post renal biopsy. The computed tomography angiography revealed a pseudoaneurysm arising from the left lower pole renal artery. Patient was a poor candidate for an endovascular approach due to severe ostial stenosis of the origin of left renal artery and presence of a covered aorto-bi iliac covered stent for abdominal aortic aneurysm. An initial percutaneous thrombin injection under ultrasound guidance resulted in occlusion of the pseudoaneurysm, however subsequent Doppler evaluation showed partial recanalization of the aneurysm. The case was further treated with ultrasound and fluoroscopic-guided injection of N-butyl cyanoacrylate (NBCA) glue.

KEYWORDS

pseudoaneurysm, cyanoacrylate glue, percutaneous thrombin

INTRODUCTION

Iatrogenic renal artery pseudoaneurysm can occur after surgery or percutaneous procedures like renal biopsy or percutaneous nephrostomy tube placement (1). Radiological localization by sonographic guidance has made performing renal biopsy simpler and more accurate with less morbidity (2). However still the commonest complication post percutaneous renal biopsy is bleeding which can present as hematuria or intrarenal/ perinephric hematoma. The bleeding can be innocuous or can be life threatening. In a study the incidence of perinephric hematoma was found to be 90% in patients after renal biopsy, of which only 6% were clinically significant (3).

Currently trans catheter endovascular embolization of the aneurysm is an established procedure to treat such iatrogenic pseudoaneurysm. (4-7) It is less invasive and causes minimal damage to the functioning renal tissue. Percutaneous thrombin injection into the pseudoaneurysm has also been reported (8,9).

We report an interesting case of percutaneous (N-butyl cyanoacrylate, NBCA) glue embolization of renal pseudoaneurysm in a patient with expanding perinephric hematoma developed post renal biopsy after partial recanalization post thrombin injection.

Very few such cases have been reported in the literature and in our patient with unfavourable anatomy for any success through endovascular approach and due to continued hemodynamic deterioration percutaneous injection of cyanoacrylate glue into pseudoaneurysm was a novel treatment option (10).

CASE REPORT

A 70-year-old man underwent a percutaneous left kidney biopsy. The biopsy was done for the assessment of unexplained oliguria and deterioration of renal function. The patient underwent an aorto-bi iliac stent graft placement 2 month ago for an infra-renal abdominal aortic aneurysm and was subsequently well for a little over a month but then progressively developed oliguria. The patient had a rise in serum creatinine levels from 1.5 mg/dl to 4.5 mg/dl and also required haemodialysis. His coagulation parameters and platelets count were normal. The biopsy was done using the 18-G biopsy needle with guidance by an ultrasound. The procedure was uneventful without any immediate complications.

Six hours after biopsy, the patient complained of abdominal pain and his hemoglobin dropped from 9.2 to 7.8 gm/dl. An ultrasound study proved that there was a retroperitoneal hematoma. The patient however maintained his blood pressure and there was no tachycardia. He was supported with blood transfusion but after 24 hours his haemoglobin dropped to 5.1 gm/dl and patient had hypotension with a blood pressure of 90/60 mm Hg and a pulse rate of 125. An urgent CT angiogram (CTA) of abdomen (arterial and portovenous phases) showed a large left retroperitoneal hematoma extending from the mid pole of left kidney and down to left iliac fossa causing displacement of

the left kidney. There was also a contrast filled outpouching measuring 1.2x1.3 cm suggestive of pseudoaneurysm seen arising from the lower polar renal artery which was reaching up to the renal capsule (fig 1). There was also presence of an aorto-bi iliac stent graft for an abdominal aortic aneurysm with associated type III endoleak. There was severe stenosis seen at the origin of the left renal artery.

In view of the findings seen on CTA and after a multi-disciplinary discussion a decision was taken to proceed with a percutaneous approach for embolization using thrombin. An ultrasound-guided Doppler examination of the left kidney was done that showed a pseudoaneurysm measuring 1.1 x 1.0 cm approximately in the lower pole of left kidney. Ultrasound-guided percutaneous thrombin injection (Tisseel Lyo 2ml, Baxter Healthcare, USA) was performed directly into the pseudoaneurysm (fig 2). The package had thrombin (500 units/ml) reconstituted with 1ml of calcium chloride solution and sealer protein concentrate reconstituted with 1 ml of fibrinolysis inhibitor solution (Aprotinin 3000 KIU/ml). The reconstituted solution was injected through a 22G spinal needle (Vygon SA, Ecouen, France). Doppler assessment after the thrombin injection showed complete obliteration of the aneurysm. The patient was subsequently shifted to the ward for observation and vital monitoring and was asked to come back to the DSA suite for review after 24 hours. Doppler examination performed after 24 hours showed a partial recanalization of the aneurysm with a residual sac of 3.0x 4.0 mm seen (fig 3). A decision was made to inject cyanoacrylate glue percutaneously directly into the pseudoaneurysm. 0.5 ml of NBCA (Nectacryl, Dr. Reddy's Laboratories, India) was mixed with 0.5 ml of iodophendylate oil (Lipiodol, Laboratories Guerbet, France) to delay the polymerization of glue and to impart radio opacity so that the solution is easily visualized on fluoroscopy. Using a 20 G spinal needle (Vygon SA, Ecouen, France) the mixture of NBCA and lipiodol was injected into the aneurysm. The placement of the needle was performed under ultrasound guidance (HD 11, Philips Medical System) and the rate of injection was monitored with fluoroscopy. There was complete obliteration of the aneurysmal sac and no blood flow was seen after the injection on Doppler ultrasonography. A check abdominal radiograph showed the stent graft and glue cast within the aneurysm sac (fig 4).

The patient became stabilized within the next few hours. The blood pressure was stabilized at 124/82 and pulse rate at 88. The drop in haemoglobin levels stopped and 4 days after the procedure the fresh levels were 7.9 gm/dl and subsequently showed rising trends. The patient remained stable and was discharged 6 days after the percutaneous procedure.

DISCUSSION

The most common complication after percutaneous renal biopsies are perinephric hematomas, but most of these are self-limiting and require no active intervention (11). Another less common complication is renal artery pseudoaneurysm. These can be asymptomatic or can become fatal if gets ruptured. The prevalence of post biopsy complications has reduced significantly due to the use of ultrasound guidance (12).

The presence of persistent abdominal, hematuria or occurrence of hemodynamic instability post renal biopsy are clinical markers of intrarenal/perinephric bleed. Computed tomography angiogram is an excellent modality to look for hematoma, active leak or artery segmental pseudoaneurysm formation (13). Currently, endovascular embolization of renal pseudoaneurysm is a relatively effective method for managing patients with renal artery pseudoaneurysm. It is a simple, safe, and fast method to controlling the haemorrhage. Endovascular coiling of the pseudoaneurysm have become the mainstay of treatment (14,15) However, the use of percutaneous approach for renal pseudoaneurysm embolization are not used frequently.

In patients like ours with complicated renal vascular anatomy endovascular approach was not technically feasible. The use of percutaneous thrombin and cyanoacrylate glue for vascular lesions are present in the literature.

The use of percutaneous ultrasound guided thrombin injection has been used for the treatment of iatrogenic pseudoaneurysm of the femoral, visceral artery aneurysm and renal aneurysms (8,9, 16,17). The advantage of using sonographic guidance during thrombin injection is real time visualization of thrombus formation. However, with thrombin injection there are chances of recanalization as seen in our case where there was partial recanalization of the aneurysmal sac within 24 hours.

There are also few isolated cases of percutaneous injection of cyanoacrylate glue into the visceral pseudoaneurysm in the literature. Percutaneous injection of NBCA into nasopharyngeal angiofibroma and arteriovenous malformations have also been reported in the literature (18-20). Cyanoacrylate glue is a permanent occluding agent which has been used in the endoluminal treatment of intracranial and extracranial vascular malformations. The basic mechanism of action is instantaneous polymerization of monomers of cyanoacrylate when it comes in contact with ionic solutions like blood or saline which results in formation of a glue cast.

Therefore, percutaneous sonography-directed thrombin and /or glue embolization is a novel technique which can be used in emergency setup in patients who cannot undergo endovascular embolization due to unfavourable anatomy or severe coagulopathy which makes an endovascular approach unfeasible.

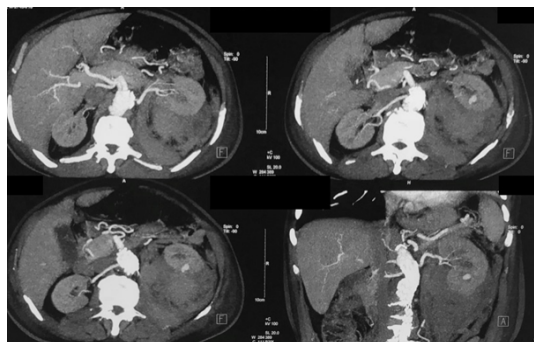


fig 1: CT Angiography reveals a contrast filled outpouching arising from the lower pole segmental artery of left kidney with a large heterogeneous perinephric hematoma causing mass effect on the left kidney.

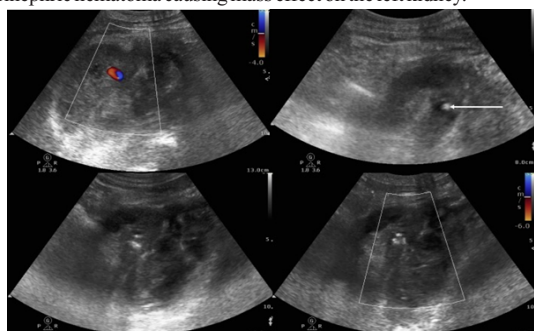


Fig 2: Color Doppler Sonography shows a pseudoaneurysm sac with ying-yang color flow pattern. The sac was punctured with a 22G spinal needle (arrow) and thrombin was injected. Post injection there was complete obliteration of the aneurysmal sac.

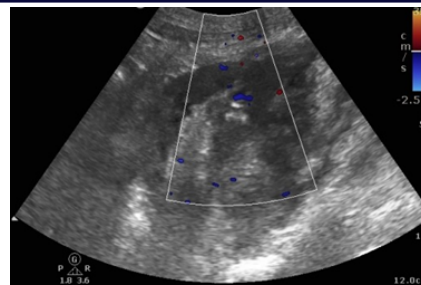


Fig 3: Doppler assessment after 24 hours post thrombin injection into the aneurysms shows partial recanalization of the sac.

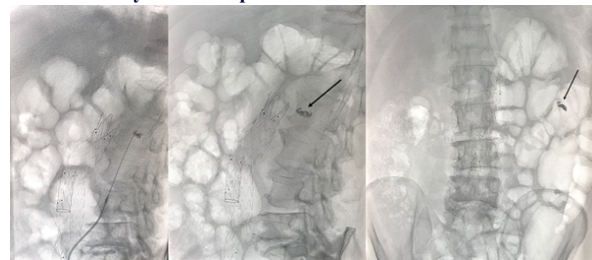


Fig 4: The residual sac was punctured by a 20 G spinal needle and under fluoroscopy guidance N-butyl cyano acrylate (NBCA) glue was injected (NBCA : lipiodol= 1:1) in the aneurysmal sac. Post injection the glue cast (black arrow) can be seen in the expected location.

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