

The Use of Interventional Radiology in Ruptured Solitary Kidneys

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Summary

This case report illustrates how a life-threatening renal bleeding which has failed to be controlled by open surgery can be elegantly managed by a minimally invasive technique of interventional radiology. It also allows maximal conservation of renal tissue so that the patient can avoid chronic dialysis or renal transplantation.

Key words: Ruptured solitary kidney, interventional radiology, therapeutic embolization

Introduction

Although trauma continues to be an important cause of patient mortality and morbidity, renal trauma is not common. In 1 report¹ renal trauma accounted for only 1 in 3,000 hospital admissions. Isolated renal injury is not common; Slade reported² that 42 of 151 patients had associated injuries. Congenital absence of one kidney is seen in 1:1,500 intravenous urograms³. Isolated rupture of a solitary kidney with delayed life-threatening haemorrhage is certainly an unusual event.

Case Report

An 8 year old schoolgirl had a fall from her bicycle and complained of left abdominal pain and gross haematuria soon after the fall. One day after the trauma she was admitted to another hospital where an intravenous urogram was done. This showed a hypertrophied solitary left kidney which appeared otherwise normal. Laparotomy (left upper quadrant) 2 days post-trauma showed a left retroperitoneal haematoma.

Her gross haematuria recurred intermittently with ureteric colic and a double-J ureteric stent was inserted at 3 weeks post-trauma as prophylaxis against ureteric obstruction. She was transfused a total of 9 units of blood. She was then discharged home for 5 days when the gross haematuria recurred.

An aortogram done at 1 month post-trauma showed bleeding from a lower branch of the upper polar renal artery (Fig 1). On the next day, open surgical exploration of the left kidney was done but no obvious bleeder was found. The kidney was found to be ruptured and the 2 halves were sutured together.

On the fourth post-operative day her gross haematuria recurred, resulting in hypertension and blood transfusion.

She was then transferred to the Urology Intensive Care Unit of General Hospital, Kuala Lumpur. Her coagulation studies were normal. Emergency arteriography showed active bleeding at the site shown on

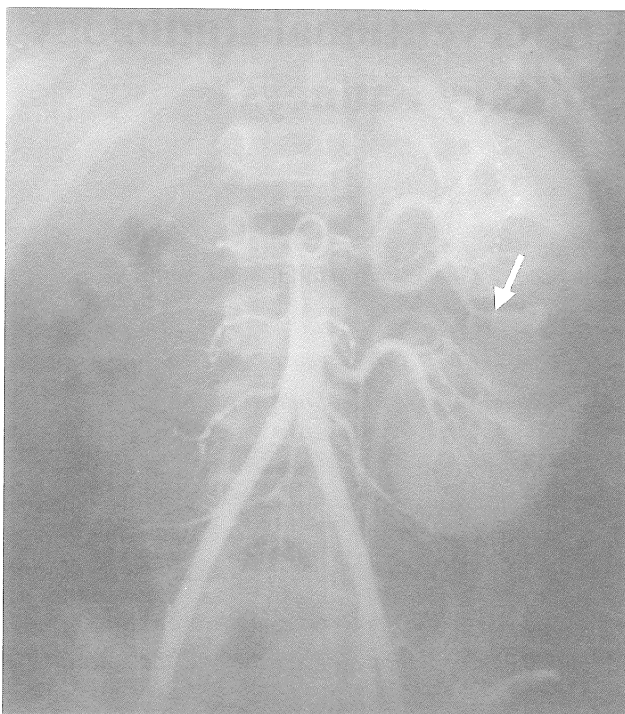


Fig 1: Free flush aortogram showing 2 separate renal arteries to a ruptured single kidney on the left. There is active bleeding from one of the branches of the artery supplying the upper pole (arrow)

previous aortography. The bleeding artery was selectively catheterised, then embolised with a 2 cm x 2 mm Gianturco steel coil and post-embolization arteriogram (Fig 2) showed that the bleeding had ceased completely.

The procedure was done under intravenous ketamine anaesthesia. The patient also received 3 doses of prophylactic antibiotic (cefoperazone and Vitamin K). Her gross haematuria ceased immediately and her double-J stent was removed.

Fourteen hours post-embolization, the patient had intermittent fits for 24 hours. Cardiovascular examination, CT scan of the brain and metabolic investigation were normal. She is on prophylactic anti-epileptic for 2 years. At 1 year post-trauma her urine, serum creatinine and blood pressure were normal.

Discussion

This case illustrates the most important indication for an intravenous urogram, i.e., to see if the patient has a normal and functioning contralateral kidney. A normal looking kidney at laparotomy is not equivalent to a functioning kidney. It would be disastrous to remove a traumatised kidney if the patient does not have another functioning kidney. Bleeding from renal injuries is usually self-limiting and seldom requires intervention. Less than 10% of blunt renal traumas end up with exploration⁴. Therapeutic immobilisation of traumatic renal haemorrhage was first described in 1974⁵. Since then, the use of interventional radiology in genitourinary trauma has been favourable⁶. Persistent hypertension occurs in 1% to 5% of renal traumas⁷ and the onset of hypertension may be years later. Hypertension may occur from renal artery injury or

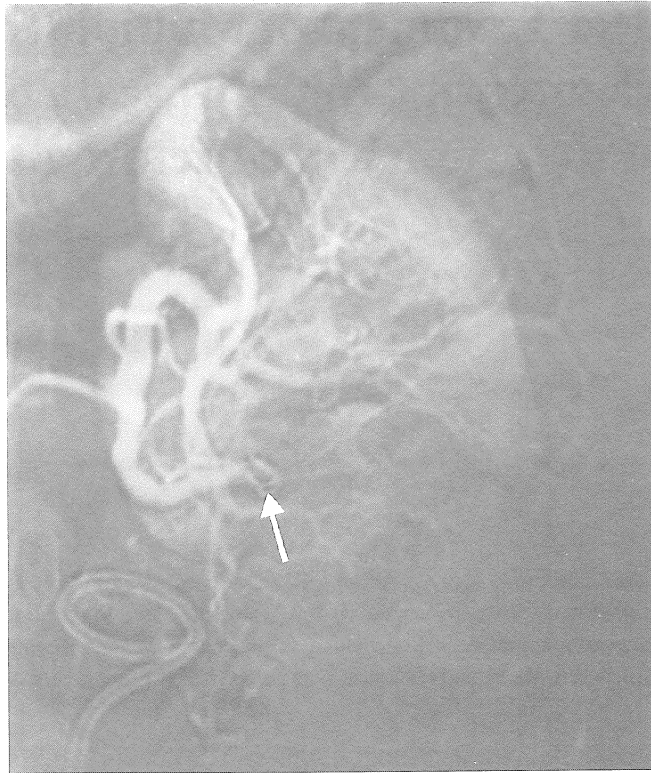


Fig 2: Post embolization arteriography showing that bleeding had ceased. The position of the coil is indicated by the arrow

perirenal constriction from capsular fibrosis⁸. Therefore, a regular monitor of the blood pressure is required for many years.

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