Angiography and Segmental Artery Embolization in Renal Stab Wound

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INTRODUCTION

Delayed or secondary renal bleeding may occur in up to 25% of cases with grade 3 and grade 4 injuries to the kidney, especially in stab wounds, when they are managed conservatively. The average interval between the injury and the onset of secondary hemorrhage is approximately 12 days (range, 2 to 36 days) and is most often due to an arteriovenous fistula (AVF) or pseudoaneurysm.[1]

An initial management of bed rest and hydration is performed routinely. In case of persistent bleeding, definite diagnosis is usually made by angiography, and selective embolization can be performed within the same angiography session as a definite treatment. Open exploration and partial or total nephrectomy are rarely required.[1,2] We report a case of delayed renal bleeding following stab wound which was treated successfully by angioembolization.

CASE REPORT

A 17-year-old man was referred to our clinic with intermittent gross hematuria. He had a history of the right flank stab wound about 2 weeks earlier. His vital signs were stable. The patient was admitted and observed for 6 days, and hematuria persisted within this period. Abdominal CT scan revealed subcapsular hematoma in the lower pole of the right kidney and a parenchymal laceration greater than 1 cm, without the rupture of the collecting system or urinary extravasation, which suggested a grade 3 injury.

On renal angiography, bleeding was detected from the segmental renal artery of the lower pole (pseudoaneurysm) of the right kidney (Figure 1). Embolization was then performed promptly using a 5-F Cobra-II catheter (Cordis, Miami, FL, USA) and a 0.018-inch soft platinum microcoil (Cook, Bloomington, IN, USA) as the embolizing agent (Figure 2). Hematuria ceased completely and the patient was discharged two days thereafter.

Figure 1. Angiography was indicative of a bleeding segmental renal artery (pseudoaneurysm).

Figure 2. Angiography after the successful embolization.

DISCUSSION

Delayed or secondary hemorrhage is a common complication of the deep lacerations of the renal cortex and medulla, especially in stab wounds.[1] It is most often a result of an AVF or pseudoaneurysm.[2] When the laceration of a large segmental branch of the renal artery exists, bleeding from the lacerated vessel is stopped temporarily due to the tamponade effect of the hematoma. With resolution of the hematoma, the artery rebleeds into the resultant cavity and forms a pseudoaneurysm. When the hematoma resulted from the laceration of a large branch of the renal artery and a large nearby vein is resolved, the arterial branch rebleeds and will be drained into the lacerated vein. This leads to the formation of an AVF. In case of penetrating trauma, a connection often exists between the collecting system and the resolving hematoma cavity; thus, bleeding from the AVF or pseudoaneurysm drains directly into the pyelocaliceal system and a very rapid blood loss may occur.[3]

Therapeutic embolization for treatment of the injuries to the renal artery branch was first described in 1973 by Bookstein and Goldstein who successfully treated the hemorrhage following renal biopsy.[4] Ulfacker and colleagues reported successful selective embolization in 14 out of 17 patients (82%) with renovascular lesions induced by penetrating injury in 10 and blunt trauma in 7.[5] Fisher and coworkers treated renal artery branch lesions by embolization in 15 patients (8 of them were injured in street knifings) and achieved hemostasis in all.[6] Kantor and colleagues performed renal embolization for arterial bleeding in 20 patients (13 of whom had penetrating injuries) and successfully controlled hemorrhage in 19 (95%).[7] In addition, using angioembolization, we can lower the risk of total renal loss in comparison with that in surgical exploration of the kidney.[8]In conclusion, these reports demonstrate successful selective renal artery embolization for managing secondary hemorrhage in stable patients after penetrating renal trauma.

CONFLICT OF INTEREST

None declared.

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