Superselective Embolization in the Treatment of Active Bleeding after Percutaneous Renal Biopsy

Dear Sir,

Renal biopsy has become an integral part in the diagnosis, management and prognosis of renal diseases. Percutaneous renal biopsy has been a relatively safe procedure. Rarely, severe hemorrhage after percutaneous renal biopsy is a risk to the patient because of high morbidity and mortality. The risk of surgery for nephrectomy or to repair a laceration due to biopsy is approximately 1/500 to 1/1,000 [1]. Recent technological improvements in intervention radiology devices have made superselective catheterization and embolization possible [2]. Superselective embolization with coaxial catheter techniques is an effective method of treating hemorrhage after renal biopsy. We present a case of active bleeding following percutaneous renal biopsy, who was treated successfully with super-selective embolization of a branch of the intrarenal artery.

A 14-year-old boy had a percutaneous renal needle biopsy performed as part of a study for glomerulonephritis. The biopsy was carried out by our usual technique with the patient in the prone position and a pillow under the abdomen. The ultrasound-guided percutaneous renal biopsy was performed using a Franklin-modified Vim-Silverman needle. The biopsy specimen was obtained easily after only one attempt. Thirty minutes after biopsy the patient experienced severe left flank pain with rapid pulse rates (124 min). An hour later, blood pressure dropped to around 90/50 mm Hg, and the patient became lethargic and extremely ill. Ultrasonic delineation of the kidney revealed a diffuse perirenal and subcapsular hematoma on the left kidney, measuring $105 \times 56 \times 44$ mm in size. The hemoglobin dropped 3.3 g during the next 2 h and required transfusion of, in total, 4 pints of packed cells. Three hours later, emergency left renal angiography was performed with a 5-french cobra 2 catheter (Terumo Co., Japan).

Fig. 1. An angiogram shows bleeding from a branch of the posterior segmental artery (arrows).

Fig. 2. An angiogram after superselective embolization with gelfoam particles shows disappearance of bleeding from the artery.
Selective angiography showed active bleeding from a branch of the posterior segmental artery (fig. 1). A coaxial technique was used for superselective catheterization to the branch of the bleeding artery. A 3-french SP catheter (Terumo Co.) and 0.018-inch steerable guidewire were introduced through the 5-french angiographic catheter. The 3-french SP catheter was advanced as closely as possible to the bleeding branch. Then, this vessel was embolized to stasis using small gelfoam particles. A subsequent angiogram after superselective embolization demonstrated disappearance of the bleeding branch and no evidence of bleeding (fig. 2). Vital signs were stabilized without evidence of further bleeding after successful embolization. The patient experienced improvement of severe left flank pain but did have moderate pain continuing 12 h after embolization. Selective renal artery embolization was first used to control hemorrhage in 1973 [3]. However, moderate to large volume loss of renal tissue occurred after successful selective renal artery embolization [4]. Other complications of selective embolization were hypertension, postembolization syndrome and shunting of embolic material into the pulmonary circulation. To minimize these complications, superselective techniques are necessary for precise catheterization and localization of the catheter tip in the vascular lesion. Orzel et al. [2] achieved hemostasis without loss of renal function by the utilized 2.2-french coaxial catheter and steerable guidewire to superselectively catheterize and embolize a small renal artery branch. In our patient, active bleeding was effectively controlled following superselective embolization of the intrarenal branch artery, and surgical approach for nephrectomy or to repair a laceration due to percutaneous renal biopsy was avoided. In summary, superselective embolization with coaxial catheter techniques is a convenient method to avoid open surgery and effectively control bleeding after percutaneous renal biopsy.

References

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