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Glue embolization of accessory renal artery pseudo-aneurysm & AVF post-PCNL

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A 28-year-old male presented to the emergency department with hematuria for 9 days. He had undergone PCNL for right ureteric calculus 10 days ago. Physical examination revealed a pulse rate of 94/minute, BP of 100/60 mmHg and severe pallor. Hemogram showed a hemoglobin level of 8.3 g/dl with a hemoglobin drop of 4.3 g/dl in the last 10 days. Ultrasound abdomen showed a right peri-nephric hematoma with a pseudo-aneurysm of the lower polar branch of right renal artery. Catheter angiography showed that the main right renal artery was supplying the upper and mid-pole of the right kidney (arrow in Panel A), and an accessory renal artery (arrow in Panel B) was seen supplying the lower-pole of the right kidney with a multi-lobulated pseudo-aneurysm (* in Panel B) arising from the accessory renal artery. In addition, an early draining vein (# in Panel B) was also seen on the arterial phase, which was confirmed to be an AVF on the venous phase (# in Panel C) with contrast draining into the IVC (arrow in Panel C). Glue embolization of the pseudo-aneurysm and the AVF was carried out using glue mixed with lipiodol (1:3). Post-embolization angiogram showed the glue-cast (* in Panel D) without any residual aneurysm or AVF. 5 units of PRBCs were given during and after the procedure. The patient was stable after the procedure and was discharged after 3 days. At the follow-up visit (1 month after the procedure), the hemoglobin level was 11 g/dl, and ultrasonography showed normal vascularity of the upper and mid-pole of the right kidney with the glue-cast in the lower polar branch. No perinephric collection was seen to suggest any recurrence of bleeding (Fig. 1).

PCNL is the procedure of choice for nephrolithiasis as it is safe and effective. However, hemorrhage is one of the most common complications (0.8–7.6%) [3]. Renal angiography with embolization is a minimally invasive procedure with a high success rate. It is required in patients who have continuous non-resolving hemorrhage [4]. Many studies have demonstrated the use of coils for this purpose and have feared use of glue due to risk of non-target embolization [1, 2]. However, in experienced hands and with proper preparation techniques, glue embolization can be used as an alternative when coils are not available. Another advantage of using glue over coils, is its cost-effectiveness. Thus, in a resource-poor setting or low affordability of the patient, glue embolization can be done, which is significantly cheaper and is equally effective, if performed by experienced interventional radiologists.

This case of post-PCNL glue embolization deserves special attention, due to a few special and peculiar points. In this case, the pseudo-aneurysm was seen in an accessory renal artery and not in the main renal artery. Furthermore, an arterio-venous fistula (AVF) was also seen with the pseudo-aneurysm. Both the pseudo-aneurysm as well as the AVF were successfully embolized using glue. We suggest that glue embolization is a better alternative than coils in cases of pseudo-aneurysms associated with AVFs, due to its ability to embolize small distal vascular channels.

Through these images, we emphasize the importance of early treatment of these otherwise life-threatening pseudo-aneurysms by using glue embolization.

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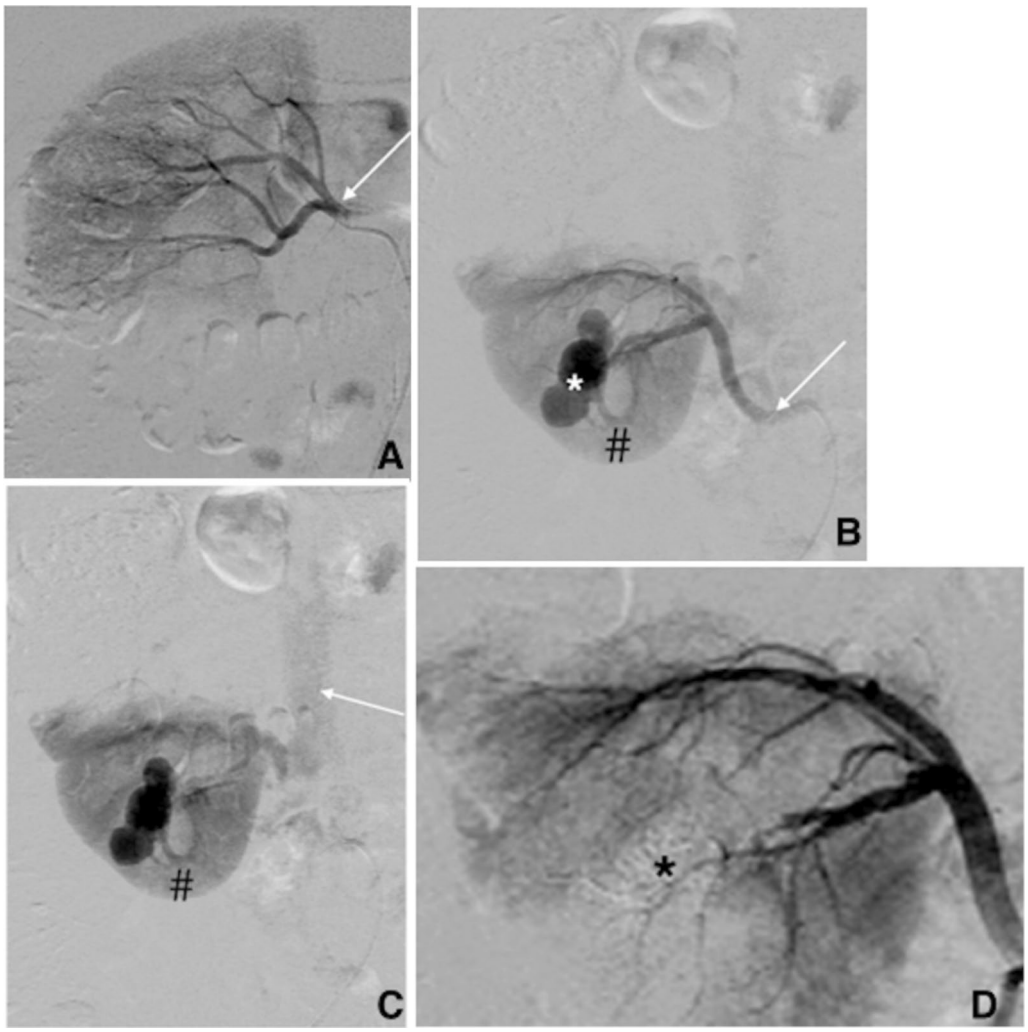

Fig. 1 Catheter angiography showing right renal artery supplying upper and mid-pole of right kidney (arrow in Panel **A**) and an accessory renal artery (arrow in Panel **B**) supplying lower-pole of right kidney with a multi-lobulated pseudo-aneurysm (* in Panel **B**) arising from it. Early draining vein (# in Panel **B**) on arterial phase, confirmed to be an AVF (arterio-venous fistula) on venous phase (# in Panel **C**) with contrast draining into IVC (arrow in Panel **C**). Post-embolization angiogram showing glue-cast (* in Panel **D**) without any residual aneurysm/AVF

Abbreviations
AVF: Arterio-venous fistula; BP: Blood-pressure; IVC: Inferior vena cava; PCNL: Percutaneous nephrolithotomy; PRBCs: Packed red blood cells.

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RS, AY, and AG: substantial contributions to conception and design, and acquisition of data, and analysis and interpretation of data, drafting the article and revising it critically for important intellectual content and performing the procedure. All authors read and approved the final manuscript.

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Availability of data and materials
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The need for ethical approval (both for "method" used and "publication") was waived by the institutional ethical committee of Sir Ganga Ram Hospital, New Delhi, as it is a retrospective case report, and the procedure described in the study is the usual procedure that we follow in our department. No modifications were made in the procedure for the purpose of publication.

Informed consent
Written informed consent was obtained from the patient prior to the procedure.

Consent for publication
Written informed consent for publication was obtained from the patient.

Competing interests
The authors declare that they have no competing interests.

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