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Ruptured Renal Artery Aneurysm Successfully Treated Emergently With Hydrogel Coils and n-BCA



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Purpose

Isolated renal artery aneurysms have an estimated incidence of 0.1 to 1.3%¹ and carry up to an 80% mortality upon rupture². Open repair has historically been the standard of care, but endovascular treatment has been employed with low morbidity and mortality.¹ We present a case of successful emergent endovascular therapy of a ruptured right renal artery aneurysm with intermediate term follow-up.

Case Presentation

A 73-year-old female presented with one day of flank pain and syncope. CT revealed a large retroperitoneal hematoma and a 2.1cm saccular aneurysm near the hilum of the right renal artery with evidence of rupture. Open aneurysmectomy with bypass was considered, but endovascular management afforded the option for exclusion of the aneurysm with embolization or, alternatively, catheter nephrectomy. Open repair was felt to be technically difficult and highly morbid.

Diagnosis

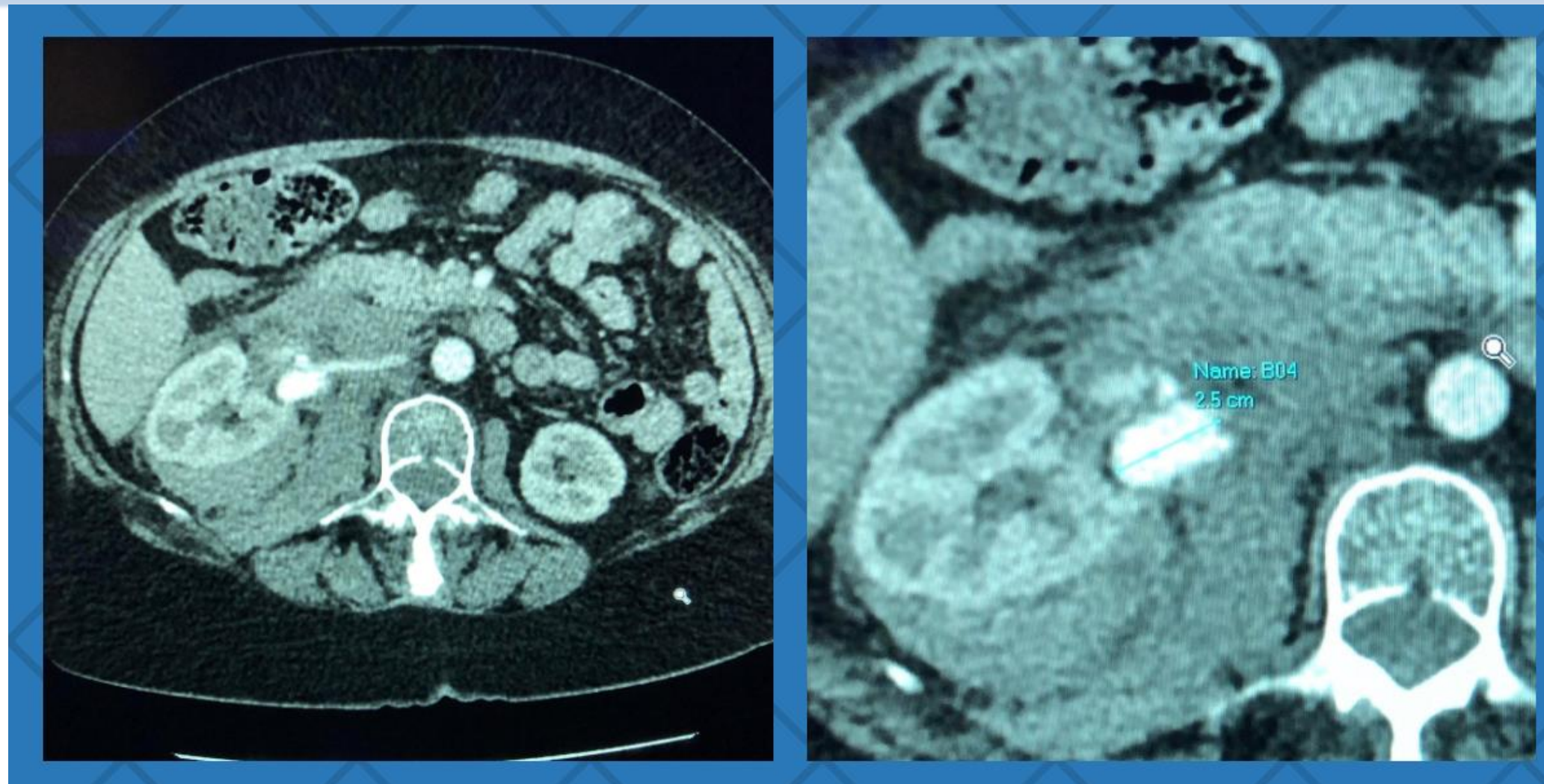


Figure 1: Axial contrast CT imaging demonstrated a 2.1 cm saccular aneurysm near the hilum of the right renal artery. Endovascular approach was selected with catheter nephrectomy considered if hemostasis could not be achieved. Although endovascular intervention was preferred to open management, embolization with preservation of renal parenchyma was technically challenging due to the origin of multiple segmental branches near the neck of the aneurysm.

Endovascular Intervention

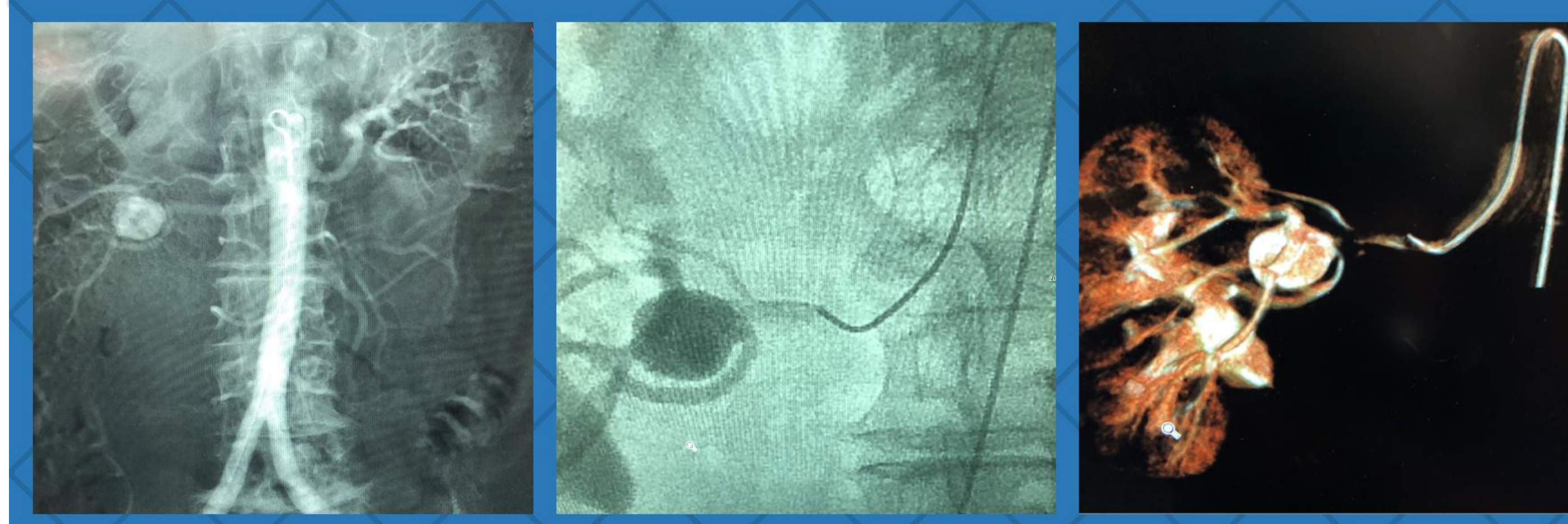


Figure 2: Aortogram via right common femoral access revealed the large saccular aneurysm of the right renal artery with no signs of active contrast extravasation present. Selective right renal arteriogram via 5 French long reversed-curve catheter demonstrated the aneurysm to be near the hilum and adjacent to multiple segmental branches. Three-dimensional reconstruction using cone beam CT demonstrated the aneurysm neck to be narrow and located distinctly from the adjacent segmental branch origins.

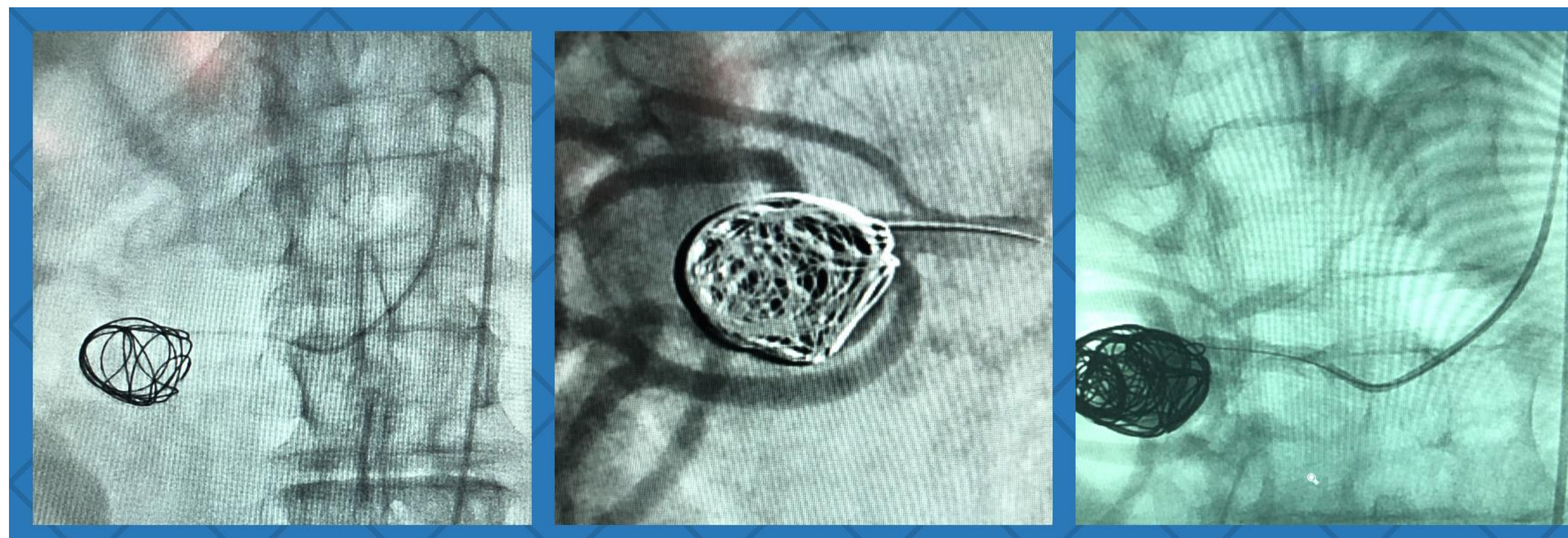


Figure 3: Coil embolization was performed via a Prowler microcatheter coaxially through the 5 French guide catheter. A combination of bare and hydrogel-coated coils led to a dense coil pack. Bare framing coils were initially used to stabilize the aneurysm with subsequent packing performed to near stasis.

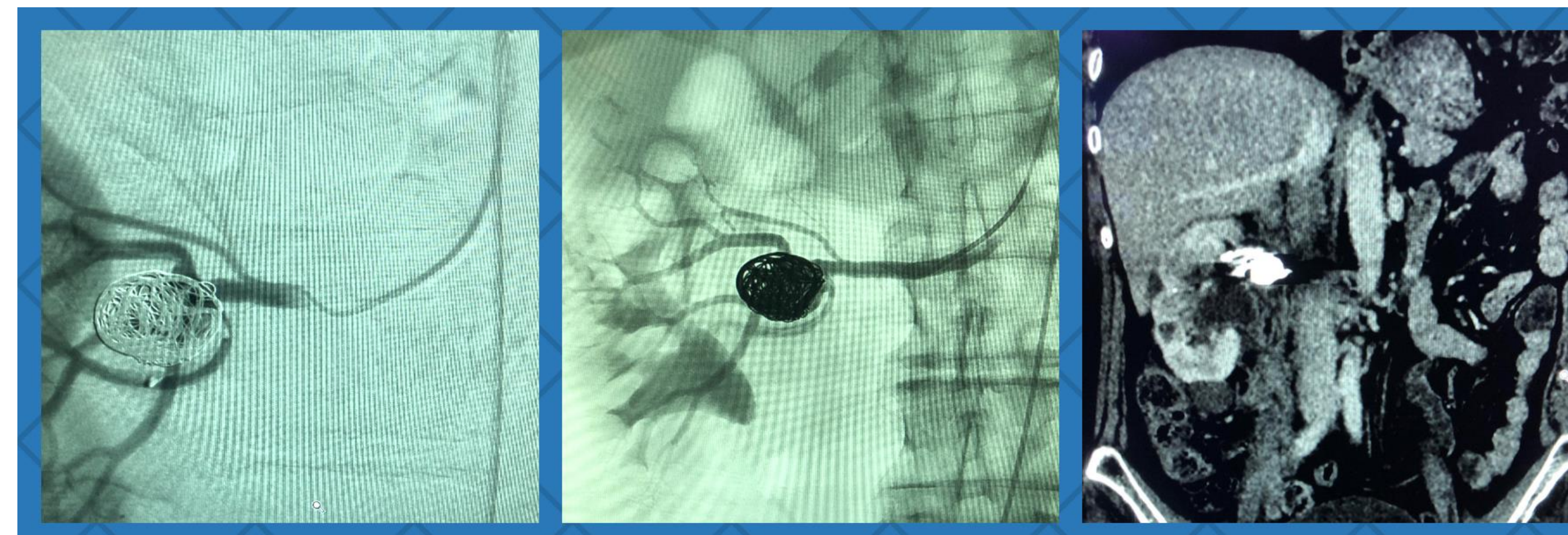


Figure 4: Liquid embolization with 0.8 cc of 40% n-BCA (Codman) was performed to seal the aneurysmal neck. Digital subtraction angiography demonstrated complete occlusion of the aneurysm with glue occluding the neck and penetrating into a single adjacent segmental branch. Post-embolization images revealed no inflow into the aneurysm and preservation of the majority of unaffected branches. Post-embolization CT imaging at 2 weeks shows no signs of perfusion deficit within the renal parenchyma and artifact from the coils and glue.

Method and Results

Endovascular access was established and the aneurysm identified per figure 2. To reiterate, the aneurysm was catheterized coaxially with a Prowler microcatheter via the 5 French catheter and then embolized using bare and hydrogel-coated detachable coils (Terumo). The hydrocoils increased packing density and allowed the use of fewer coils as a result. The decision to seal the neck with n-BCA was driven by recent rupture and persistent inflow despite coil embolization. Post-embolization images revealed no inflow into the aneurysm and preservation of the majority of unaffected branches.

Follow-Up

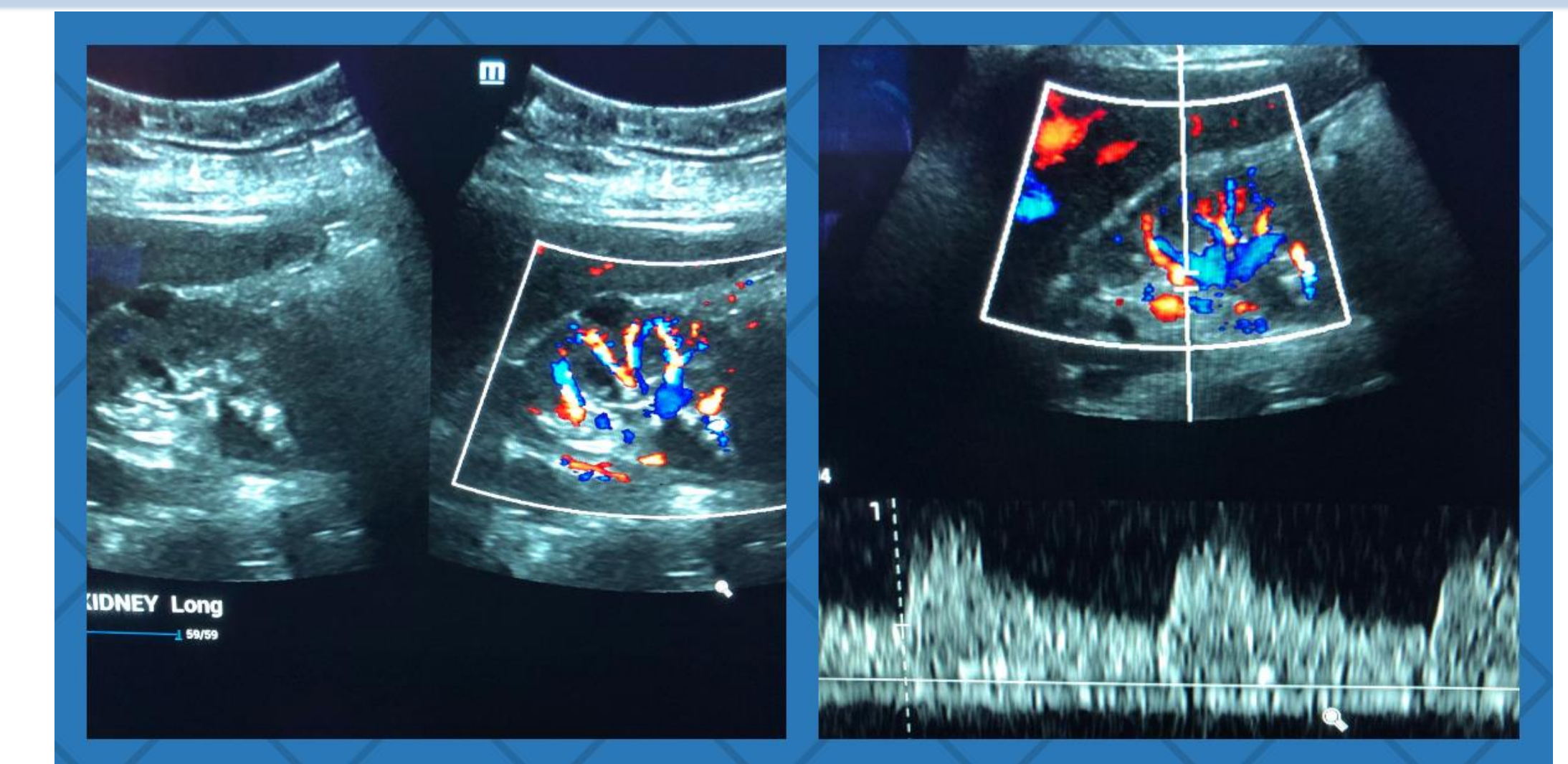


Figure 5: The patient was discharged home and has remained well as an outpatient fourteen months to date. Renal Duplex revealed durable embolization of the aneurysm on six month follow up. Doppler confirmed flow preservation within segmental branches adjacent to the embolization site with persistent perfusion to the right kidney and no signs of flow within the aneurysm.

Conclusions

- Emergent endovascular therapy for ruptured renal artery aneurysms can be performed successfully using hydrogel coils and n-BCA glue to achieve instant hemostasis and a durable clinical result.
- Cone-beam CT is useful in guiding therapy by demonstrating the size and location of the aneurysm neck.