Outcomes of Type II Endoleak Management After Abdominal Aortic Aneurysm Repair: A Retrospective 18-year Cohort

[1]Osman, Murat MD, [1]Patel, Aesha MD, [2]Ozen, Merve MD, [1]Bhanot, Shelly MD, [1]Ulku, Turba MD, [1]Arslan, Bulent MD

[1]Rush University Hospital, Chicago IL, [2]University of Kentucky, Lexington, KY

RUSH

Introduction

Endovascular aneurysm repair (EVAR) has become the preferred method in the elective setting to manage aneurysms due to an overall lower periprocedural mortality, complication rate, and length of hospital stay compared to open repair. However, EVAR is associated with high re-intervention rates, largely secondary to endoleaks which are either subclinical, result in failure of aneurysm regression, or cause aneurysm expansion following EVAR. Type II is the most common form of endoleak (10-25%) and is defined by retrograde collateral flow into the excluded aneurysm sac[1]. Depending on the type and number of feeding vessels, flow velocity of the vessel, and presence of outflow vessels, expansion of the aneurysm sac may occur weeks to years following stenting. Thus, close follow-up of all patients who undergo EVAR is recommended.

Purpose

To assess technical and clinical outcomes of interventional management of Type II endoleak (T2EL) after abdominal endovascular aneurysm repair.

Materials and Methods

Between 2004 and 2022, patients with T2EL were identified through medical chart review and included in the study cohort. Patient demographics, embolization technique/material type, technical success and clinical success were evaluated. Clinical success was defined by both sac size decrease/stability (2 mm/year) for greater than 6 months. Patients with CT follow up for a minimum of 1 month were included in the study, and overall available follow up ranged between 1 month to 17 years. Major adverse events were reviewed.

Patient Demographics

- 49 patients were identified with T2EL on follow up CT imaging with either interval aneurysm growth or aortic aneurysm > 5 cm.
- 16 out of 49 patients had stable aneurysms and did not require intervention.
- 15 out of 42 transarterial procedures were excluded from the analysis as 13 were diagnostic/no intervention was performed, and two cases were secondary to type IA endoleaks found intraoperatively.

Sex	Total #	Avg Age	Median	Range	Smoking Hx	# Avg PPY
Male	36	72.0	70.8	45-94	29/34	25.9
Female	13	75.4	74.2	54.4-91.1	10/14	32.3

Transarterial Embolization

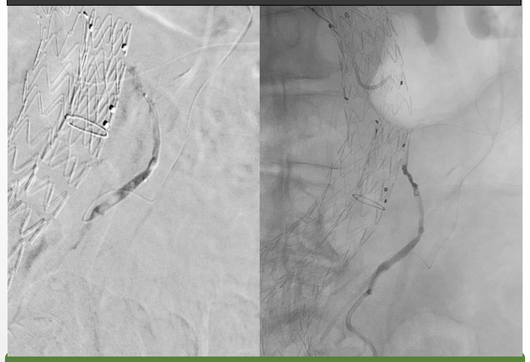

Figure 1: An 85-year-old found to have an enlarging abdominal aorta two years following EVAR. Selective catheterization of the arc of riolan demonstrates to and fro-flow into the excluded aneurysm sac. The feeding vessel was coiled distal to the origin of the IMA with satisfactory stasis.

Direct Sac Puncture

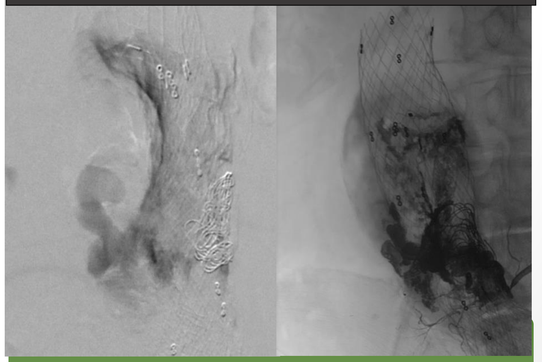

Figure 2: A 90-year-old presents with an enlarging aortic aneurysm 5 years following EVAR. Percutaneous access into the excluded sac demonstrates brisk flow into the sac with inflow/outflow nidus via lumbar vessels. Embolization with Onyx-34 was injected which formed a cast with adequate stasis.

Results

- Technical success in transarterial (TA) and direct sac puncture (DSP) groups were found to be 70% (n=19/27) vs. 90% (n=26/29), respectively.
- A higher rate of sac size stability or regression was observed after DSP vs TA embolization, 92% (n=24/26) vs 69% (n=9/13).
- Change in average sac diameter after TA and DSP embolization was 0.4 and -1.4 mm, respectively (P=0.29).
- The average freedom from sac size enlargement after TA and DSP was 522 vs 730 days (P=0.19).
- Major adverse event from TA embolization included nontarget embolization to the lower extremity requiring thrombectomy (n=1/27, 3.7%).
- Major adverse event from DSP included retroperitoneal hemorrhage requiring embolization (n=1/29, 3.4%).
- No procedure-related mortality was observed.

Conclusion

Overall success for sac size control for T2EL was achieved better with DSP compared to TA approach. Both TA and DSP embolization are deemed safe and have similar procedure-related major adverse event rates.

References

1. Bryce, Yolanda, et al. "Type II endoleaks: diagnosis and treatment algorithm." *Cardiovascular Diagnosis and Therapy* 8.Suppl 1 (2018): S131.