Endovascular Treatment of Type II Endoleaks

Claudio Schönholz, MD
Medical University of South Carolina
Charleston, SC

2016
Endoleak Types

- **Type I endoleak**
  - Proximal or distal attachment
- **Type II endoleak**
  - Retrograde branch flow
- **Type III endoleak**
  - Structural defect or component junction
- **Type IV endoleak**
  - Trans-graft leakage or porosity
Type II

- Retrograde flow from one or more branches within the excluded segment by endograft.
- Transient (<6 months)
- Persistent (>6 months)
Type II

- 60% will occlude at one month
- Persistent: more than 6 months
- 5-6%: will induce sac enlargement
- 0.52% rupture (1/191)
- Clinical evolution of patients with Type II is not significantly different than patients without endoleak

WHEN SHOULD TYPE II ENDOLEAKS BE TREATED?

“"If the endoleak continues to be present on the 6-month scan, there is a small chance that it will spontaneously thrombose”

1. Treat a type II endoleak if there is evidence of sac enlargement
2. Intervene regardless of the status of the aneurysm sac
ENDOLEAK ANATOMY

- Simple: small cavity and has ingress and egress from a single vessel
- Complex: multiple ingress and egress vessels
The endoleak cavity acts as an “Arteriovenous malformation nidus,” and thrombosing this nidus is what provides a successful and durable response.

Richard A. Baum, MD
Do stable type II endoleaks require treatment after EVAR?
Endovascular Today
How to treat Type II Endoleaks: Embolize the artery feeding the endoleak cavity by a transarterial route?

• This technique has proved ineffective, providing only short-term response if the sac can not be reached by the embolic agent.

• Endoleaks will recur by recruiting additional aortic branch vessels.
How to treat Type II Endoleaks: ACCESS to the SAC

• Coils, glue or onyx to completely thrombose the endoleak cavity

• Instead of treating feeding vessels, the endoleaks themselves are being embolized

• The connection between ingress and egress vessels, as well as the endoleak cavity, is blocked
How to treat Type II Endoleaks: How to access the sac?

- CT/Fluoroscopy guided
- Retrograde in between the iliac limb and the iliac artery wall
- Trans-IVC
- Trans-Graft
Type II Endoleak
Growing aneurysm sac
Perc angiogram
Microcatheter access
Renal angiogram
Coil embolization
Onyx embolization
Retrograde in between the iliac limb and the iliac artery wall
Transcaval embolization as an alternative technique for the treatment of type II endoleak after endovascular aortic aneurysm repair

Salvatore T. Scali, MD, Adrian Vlada, MD, Catherine K. Chang, MD, and Adam W. Beck, MD, Gainesville, Fla

The purpose of this report is to highlight our experience with transcaval embolization (TCE) for the management of type II endoleaks (T2Es) as well as to provide a technical description of how to improve procedural safety and success. All patients underwent transfemoral venous access with transcaval puncture into the excluded aneurysm sac with coil placement and selective thrombin injection. Six patients (100% male; mean age [standard deviation] 72.7 [10.8] years) underwent TCE. Technical success was 100% with no postoperative complications. At median follow-up of 8.1 months (range, 2-22 months), two patients had persistent T2Es, with one requiring repeat TCE and the other having cessation of aneurysm growth. The TCE provides a practical alternative to trans arterial or trans lumbar access for the management of T2E, with high degrees of technical and clinical success in this small case series. Larger patient numbers and longer-term follow-up are needed to define procedural efficacy and durability. (J Vasc Surg 2013;57:869-74.)

Although debate exists about when to intervene upon type II endoleak (T2E) after endovascular aortic repair (EVAR), several techniques have been described for the management of this problem. Frequently, superior mesenteric or internal iliac artery collaterals to the inferior mesenteric artery or lumbar arteries are accessed to deliver the embolant; however, limitations of these approaches include technical failure, difficulty in performance, and/or recurrence in 20% to 80% of cases. Alternatively, trans lumbar puncture has been shown to have more durable success rates in >70% to 90% of patients beyond 8 months. Despite enthusiasm for a trans lumbar approach, this technique often necessitates administration of conscious sedation or general anesthesia, and success depends on traversing multiple tissue planes with potential risk of inadvertent injury to neighboring peri aortic structures.

As a more direct alternative approach, transcaval embolization (TCE) for the treatment of T2E has been reported. The focus of this report is to describe our experience with TCE and to highlight the technical conduct of the procedure.

METHODS

Clinical database and patient cohort. All patients who underwent attempted TCE were identified. During the study interval (2009-2012), 28 type II embolization procedures were performed. Seven TCE procedures (in six patients) were completed and constitute the study cohort. The study was approved by the University of Florida Institutional Review Board.

A variety of commercially available endografts are used in our practice, and device selection and implantation were based upon the operating surgeon's discretion and according to the manufacturer's instructions for use. Indications for postoperative imaging were based on a predefined computed tomographic angiography (CTA) imaging protocol (1- to 2-mm cuts) that included delayed venous phased imaging at 1.6, and 12 months and annually thereafter unless radiographic abnormalities, endoleak, or graft integrity dictated otherwise.

Reintervention for T2E was undertaken if endoleak persisted beyond 6 months and there was documented increase (>5 mm) of aneurysm diameter on centerline reconstruction (TeraRecon Inc, San Mateo, Calif). Technical success was defined as the ability to gain catheter access to the endoleak cavity and deliver embolant without
Type II Endoleaks

Common 10-25%
Most are benign
Most thrombose over time
Most are not associated with sac growth
Most do not lead to rupture
Small percent cause growth
Small percent do rupture
The Best Strategy for Treatment of Type II Endoleaks

- ACCESS THE SAC
- Try to embolize ingress and egress vessels
- Fill the “Nidus” with Coils, glue & onyx
Endovascular Treatment of Type II Endoleaks

Claudio Schönholz, MD
Medical University of South Carolina
Charleston, SC

2016