Transabdominal Direct Sac Puncture Embolization of Type II Endoleaks after EVAR

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Disclosure

Speaker name: Rebecca Zener
I do not have any potential conflict of interest
Study Objective

• To evaluate the safety and efficacy of trans-abdominal direct puncture for embolization of T2E following EVAR
Methods

• Review of 29 patients (4F, 25M)
  • Mean age = 79y

• Underwent 32 trans-abdominal direct sac puncture embolizations of T2E following EVAR
  • NBCA only (43.8%)
  • NBCA and coils (37.5%)
  • Onyx with or without glue/coils (18.8%)
T2E: Indications for Treatment

- > 5 mm sac diameter enlargement
- > 5% increase in sac volume
- Ruptured AAA treated with EVAR that develops T2E
Type II Endoleak (T2E): Principles of Treatment

- Aneurysm sac behaves like an AVM
- Filling the aneurysm sac $\Rightarrow$ prevent shunting between feeding arteries
- Embolizing feeding arteries $=$ essential
- Coiling feeding artery alone is NOT sufficient
T2E Pre-Trans-Abdominal Direct Sac Puncture Embolization
Pre-Procedure Management

• Out-patient procedure

• Fasting overnight

• Antibiotics: Ancef and Flagyl IV
Patient supine
Press hard with probe

Aim 18 g needle deep & posterior, target: endoflow
Bowel Moves Out of the Way Easily

Supine

Prone
Transabdominal Direct Puncture
Technique & Embolic Agents

• Advance microcatheter as close as possible to largest feeding arteries (i.e. L4-5 lumbars) and coil them if possible

• N-butyl cyanoacrylate (NBCA) glue and lipiodol mixture
  • 1 : 3-4 glue: lipiodol

• Onyx
  • Inject dilute Onyx 18 to start until feeders embolized
  • Then fill the sac with Onyx 34
If Antegrade Flow in IMA...
Coil Near Its Origin to Prevent Distal Colonic Embolization
Embolize the feeding vessels then fill the sac

- Example using Onyx
Methods

• Manual segmentation of aneurysm sac volume pre- and post- embolization on CTA using Aquarius Terarecon

• **Primary outcome: freedom of aneurysm growth**
  • ≤5% aneurysm sac volume change on follow-up CT imaging

• **Secondary outcomes: technical success and complication rate**
29 patients

Clinical follow-up with Doppler U/S or CTA: 21 patients (72%)

17.2 months

CTA follow-up: 20 patients (69%)

7.1 months

No follow-up: 8 patients (28%)

Mean follow-up duration
Results

• Primary Technical Success = 97% (28/29)
  • Complete endoleak embolization on fluoroscopy

• Freedom of aneurysm growth = 80% (16/20)
  • Based on aneurysm sac volume on CTA

• Clinical success with aneurysm stability without endoflow on U/S = 81% (17/21)
Change in aneurysm sac volume (mL)

1% decrease in aneurysm sac volume ($p > .05$)

Pre: 318.2
Post: 311.3
Technical and Safety Results (n=32)

- Technical parameters
  - Median fluoroscopic time = 11.3 minutes
  - Median procedure time = 90 minutes

- Safety
  - No aneurysm or procedure related mortality
  - 9.4% complication rate (3/32)
  - 1 non-target embolization → neuromuscular injury to psoas resolved within ~6 months
  - 2 self-limiting rectus sheath hematomas
Conclusion

• Percutaneous transabdominal direct puncture for type II endoleak embolization
  • Safe
  • Efficacious
    • 80% freedom of aneurysm growth based on volume
  • Efficient
    • No CT required for access
    • Easy to gain entry into endoleak and feeders
    • Low procedure and fluoroscopic time
  • Accepted by patients (comfort)
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