Optimal Surveillance Methods and Timing after F/BEVAR and EVAR

Sara L. Zetterwall MD, MPH
Assistant Professor of Surgery
University of Washington
Seattle, WA

Disclosures

- W.L Gore – Scientific advising
- Cook Medical – Scientific advising
- Terumo Aortic – Scientific advising

SVS Guidelines (2018)

Type II Endoleak/Sac Enlargement

30-Day CTA
- \+ Fu Imaging at 6 months (CTA & duplex)
- — Fu Imaging at 12 months (CTA or duplex)

12 Month Imaging
- \+ Q6 Months Duplex x 24 months
- — Annual Duplex

* CTA at 5 years

ACC/AHA Guidelines (2022)

30-Day CTA → NO Endoleak/Sac Enlargement → Annual Duplex

- For patients with abnormal findings on duplex additional CTA imaging warranted
  - Sac Enlargement
  - Endoleak
  - Stent Fracture, Migration, separation
- CTA at 5 years

ESVS Aortic Guidelines (2024)

30-Day CTA
- No High Risk Features → CTA at 5 years
- High Risk Features → Annual CTA or Duplex
- Type 1/3 Endoleak Compromised Seal → Reintervention

- High Risk Features
  - Short seal (<10mm), Angulation (>60, Iliac (>20mm), Large Neck (>30), New/Non-standard technology
- CTA at 5 years

F/BEVAR Guidelines

- ESVS:
  - CTA at 30 days, 1-year, then individualized
  - Duplex may be considered after the first year in select patients
- ACC/AHA: combination of CT and duplex of target vessels
- US IDEs: 30-day, 6- month, annual

"No solid evidence on best practice for surveillance after F/BEVAR….is an evolving technology, robust surveillance is imperative"

Optimal Modality: CTA

- CTA is gold standard
  - Identifies high risk features associated with rupture
    - Stent fracture/Migration
    - Endoleak
    - Sac Expansion
    - Synchronous aneurysm
  - Allows planning for reintervention
- Drawbacks
  - Expensive, radiation/contrast exposure
  - >50% don't have high risk pathology

Iscan et al. J Card Surg. 2021, Pineda. J Vasc Surg 2017.

Optimal Modality: Duplex

- Duplex has an important role
  - Cost-effective technology without radiation
  - 95-100% sensitive and specific for the most important predictors of rupture (sac size and type 1/3 endoleak)
- Drawbacks
  - Less sensitive for type 2 endoleak
    - Probably don't matter without of sac expansion anyway
  - Doesn't identify stent fracture, migration, seal lengths
  - Doesn't evaluate synchronous aortic aneurysms

Iscan et al. J Card Surg. 2021

Timing of Surveillance: SVS or ESVS?

- Imaging timing more controversial
  - US guidelines recommend annual surveillance
  - ESVS recommend low frequency follow-up (repeat scan at 5 years)
- ESVS guidelines to space out surveillance are appealing
  - Significant reduction in cost
  - Ease clinic and administrative burden of follow-up efforts

Timing of Surveillance: SVS or ESVS?

- Limited data to support safety of expanded follow-up windows
  - Clinical features associated with rupture are often not detected on 30-day CTA
    - Sac Expansion (up 25% by 3 year)
    - Stent Fracture/Migration (3-4% by 4 years)
    - Endoleak (~50% of endoleaks identified between 1 month and 5-year)
  - 20-30% of patients require reintervention following EVAR
    - No clear inflection point for reintervention has been identified

Hwang et al. Vasc Specialist Int. 2021, Tonnessen, et al. J Vasc Surg 2021, Pineda. J Vasc Surg 2017. Corriere et al. Annals of Surg. 2004

Conclusions

- CTA and duplex are both critical to optimal surveillance
  - After EVAR, CT imaging should be done at 30-days and 5-years, as well as for those patients with concerning findings on duplex
- More research is necessary to identify those patients who can safely be surveilled at longer intervals and F/BEVAR
  - Until those intervals can be defined, safest care is continued annual surveillance

Thank you!