CIRA Case of the Week
September 2015

Case Courtesy of Drs. Pierre-Luc Bécotte and Bao Bui

Université de Sherbrooke

CASE HISTORY

- 75 year-old patient with multiple comorbidities and known 5 cm juxtarenal aortic aneurysm (JAA) consults for increasing abdominal pain
  - CTA : 1 cm enlargement of the aneurysm sac over the last 3 months (5 cm -> 6 cm) with subtle periaortic fat stranding

CASE HISTORY

- Neck of the aneurysm less than 3 mm under left renal artery
- Open repair not a good option due to high surgical risk
- What are the options?

In Vivo Fenestration

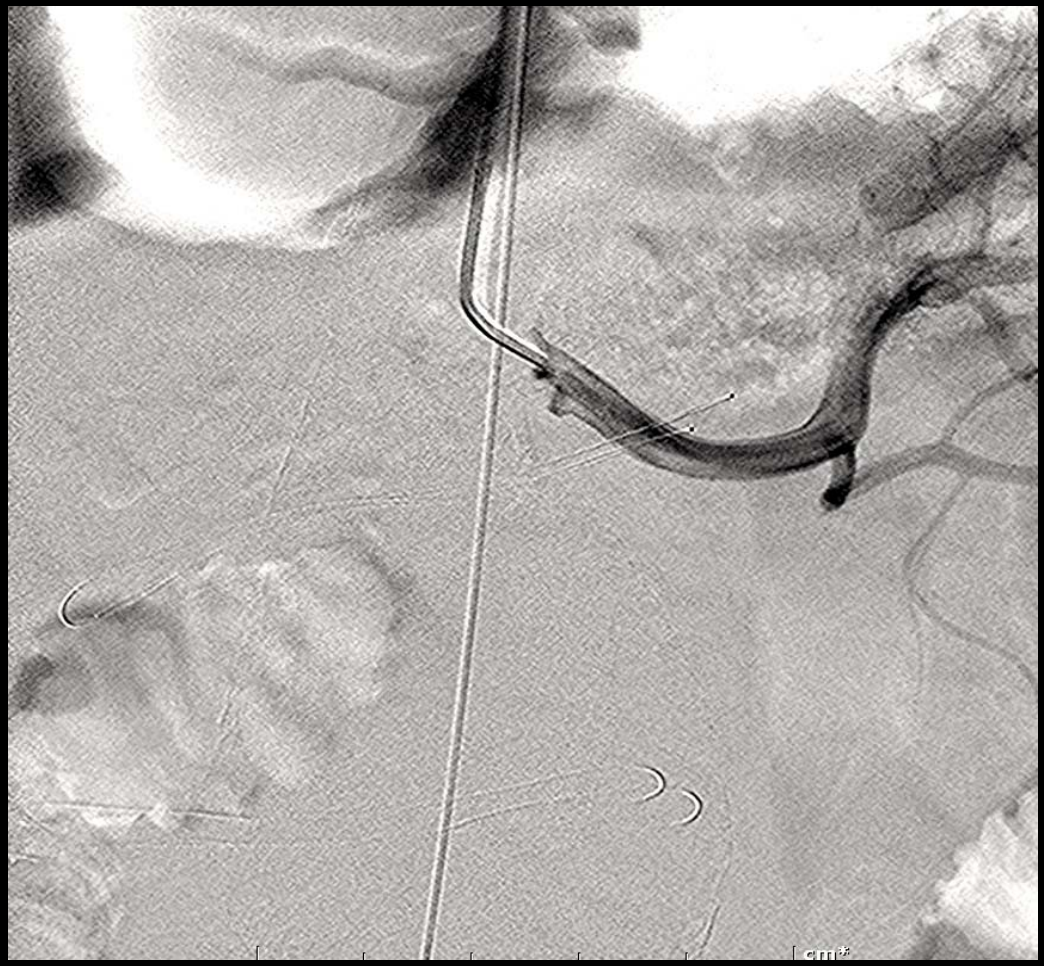
- In theory :
  - Low leak rate
  - Easy to learn and to perform
  - No delay (using off the shelf devices)
  - Possible emergency use
- Anecdotal reports
  - In vivo antegrade fenestration of abdominal aortic stent-grafts Tse LW; Bui BT; Lerouge S et al Journal of Endovascular Therapy 2007 Apr; Vol 14 pp158-167
  - Radiofrequency perforation system for in vivo antegrade fenestration of aortic stent-graft Tse LW; Lerouge S; Bui BT et al Journal of Endovascular Therapy 2010 Apr; Vol 17 pp192-198

Challenges

- Prevention of ischemia
- Marking the ostium of the target vessel
- Perforation of the membrane
- Creation of fenestration
- Connection with aortic lumen with stent-graft
- Minimize migration problem

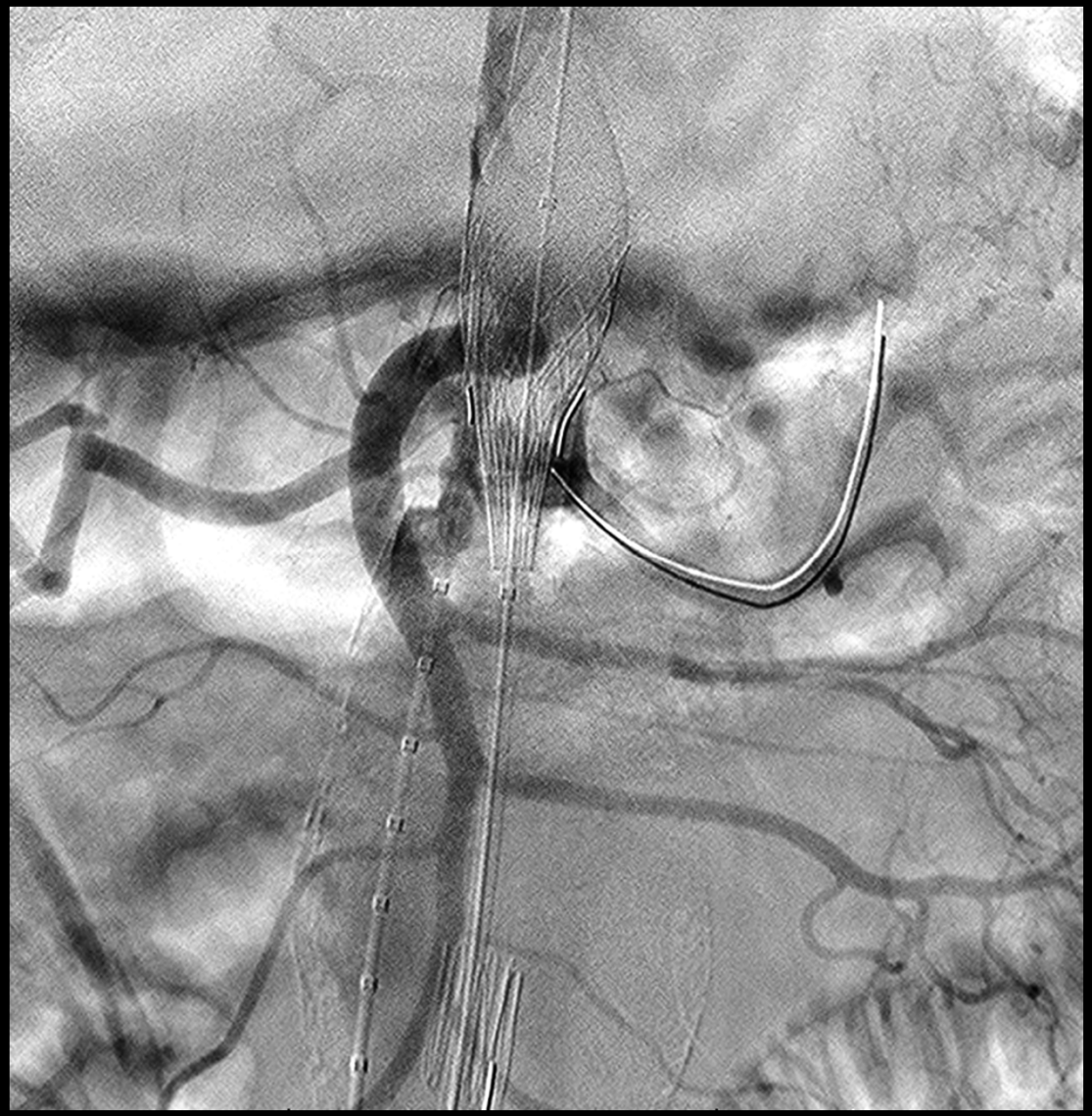
Back to the case

Identifying left renal artery from brachial access

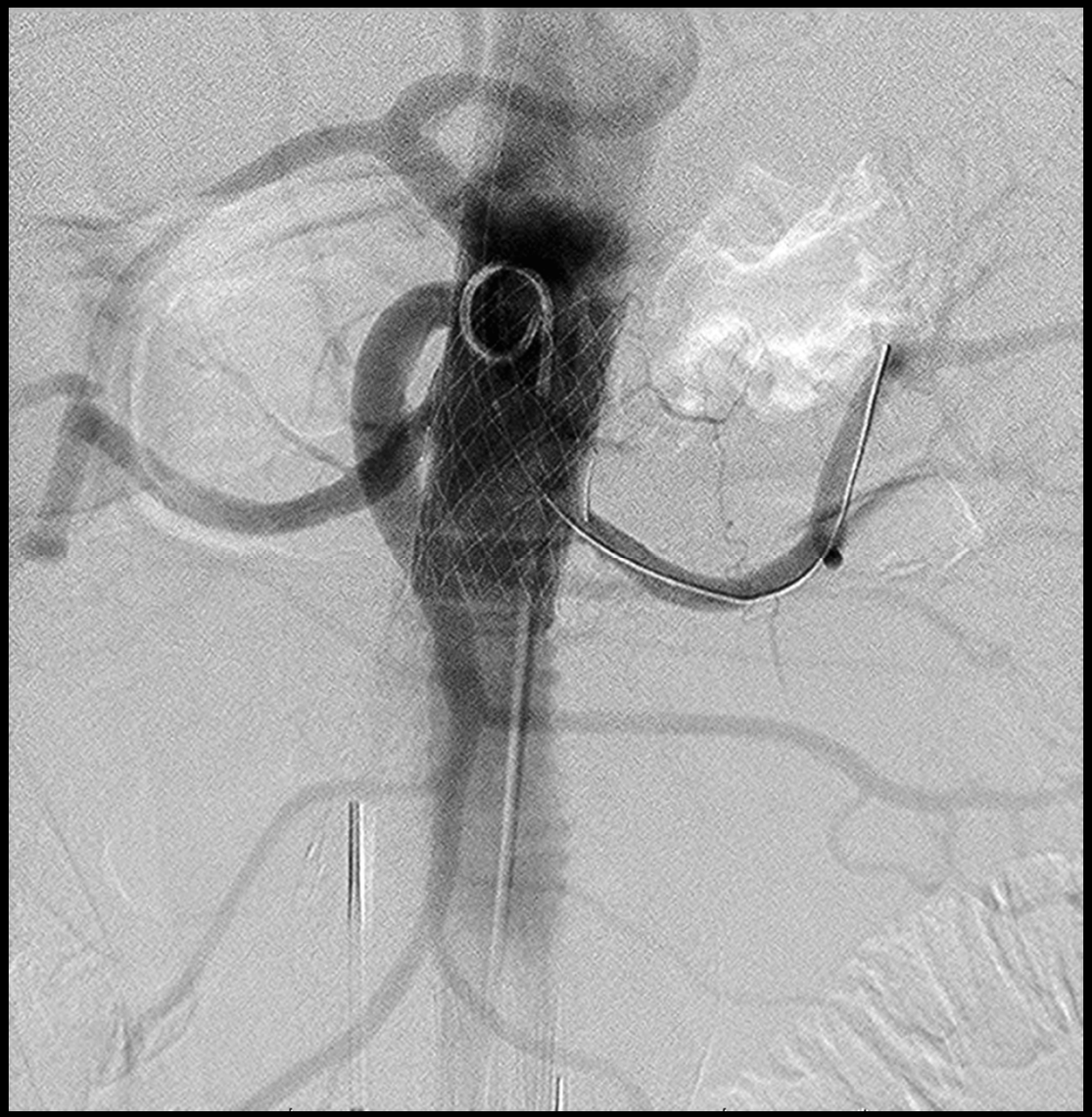


Placement of the main body

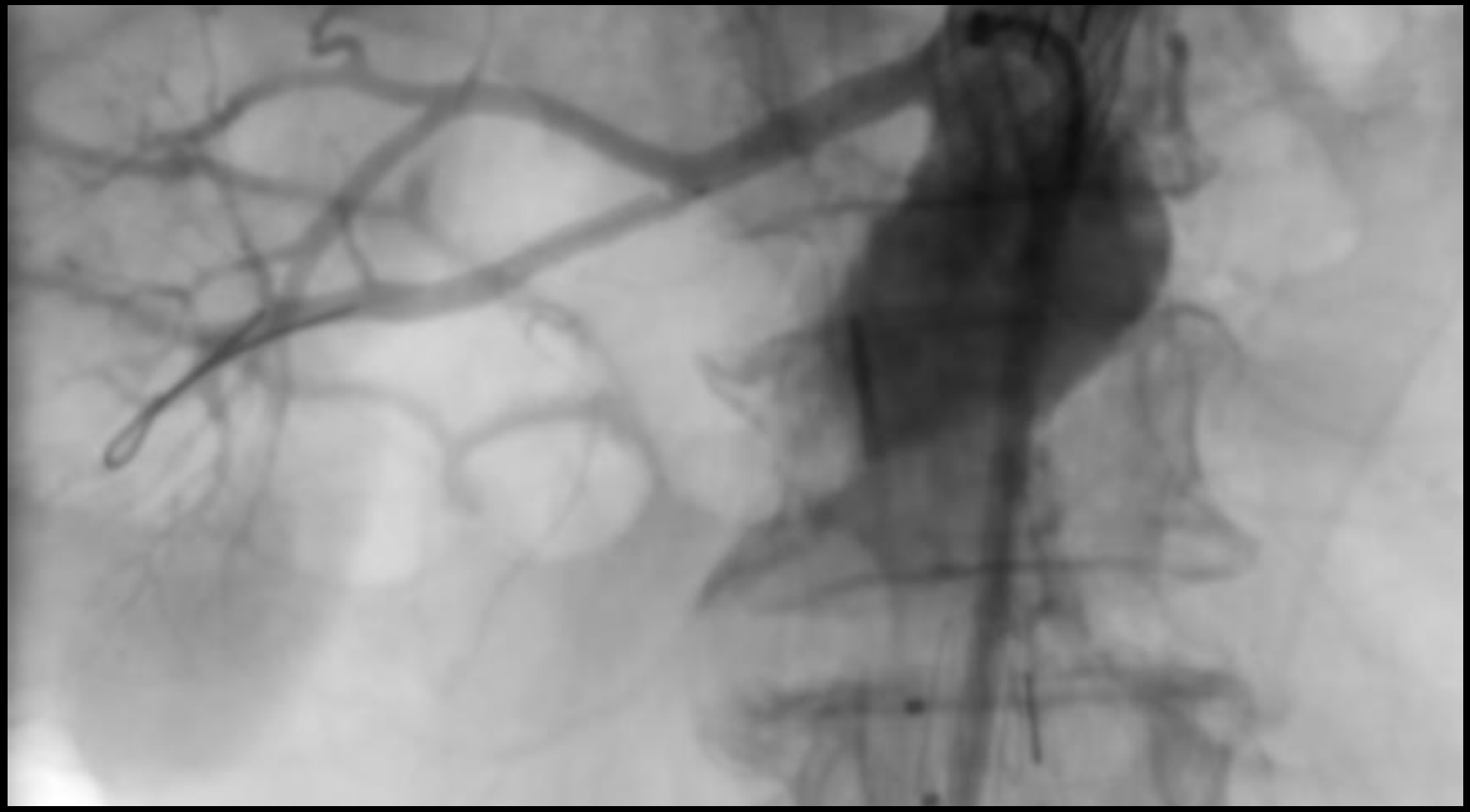
Deployment of the main body



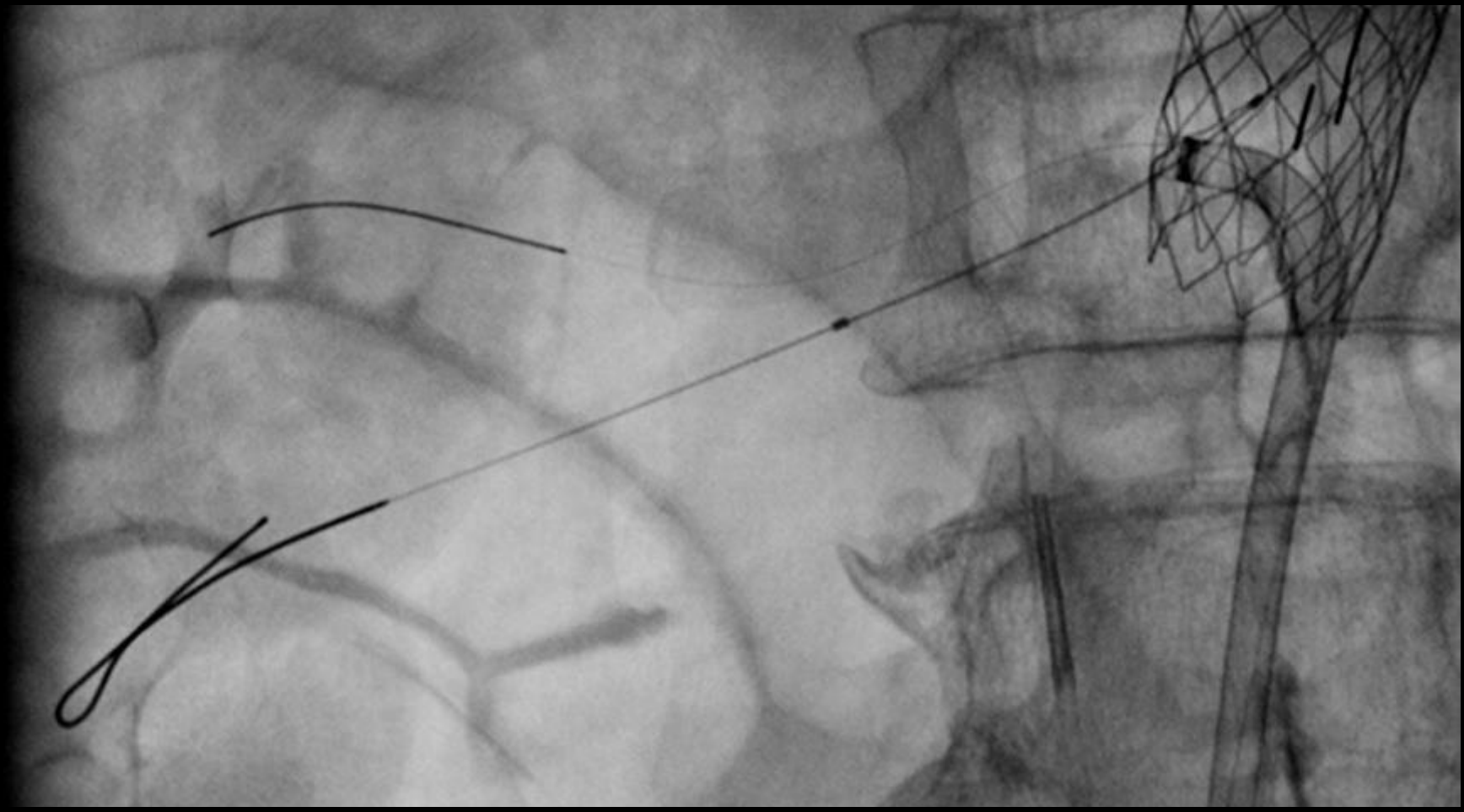
Aortography post balloon expansion



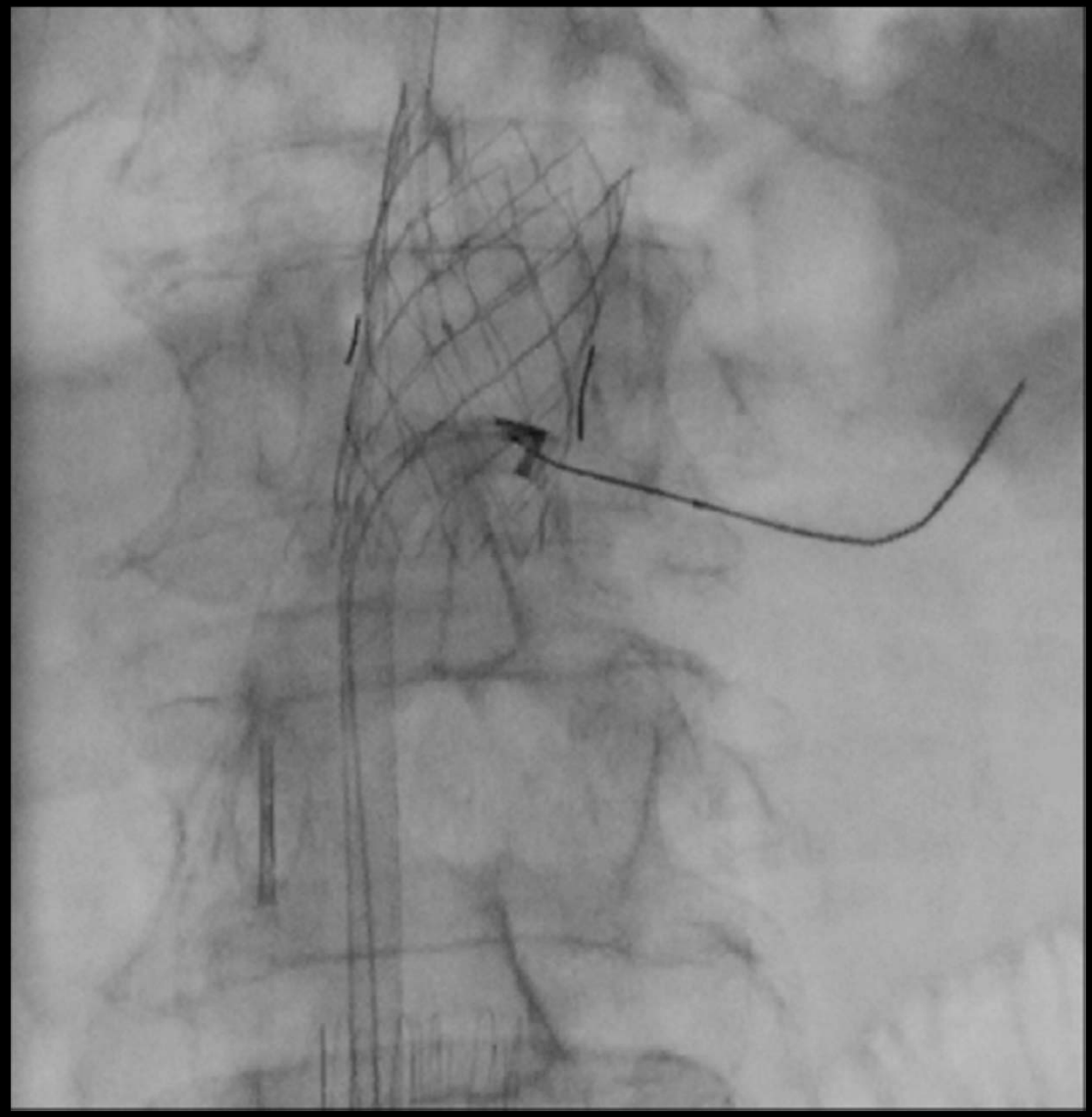
Intra-aortic injection to identify perforation site



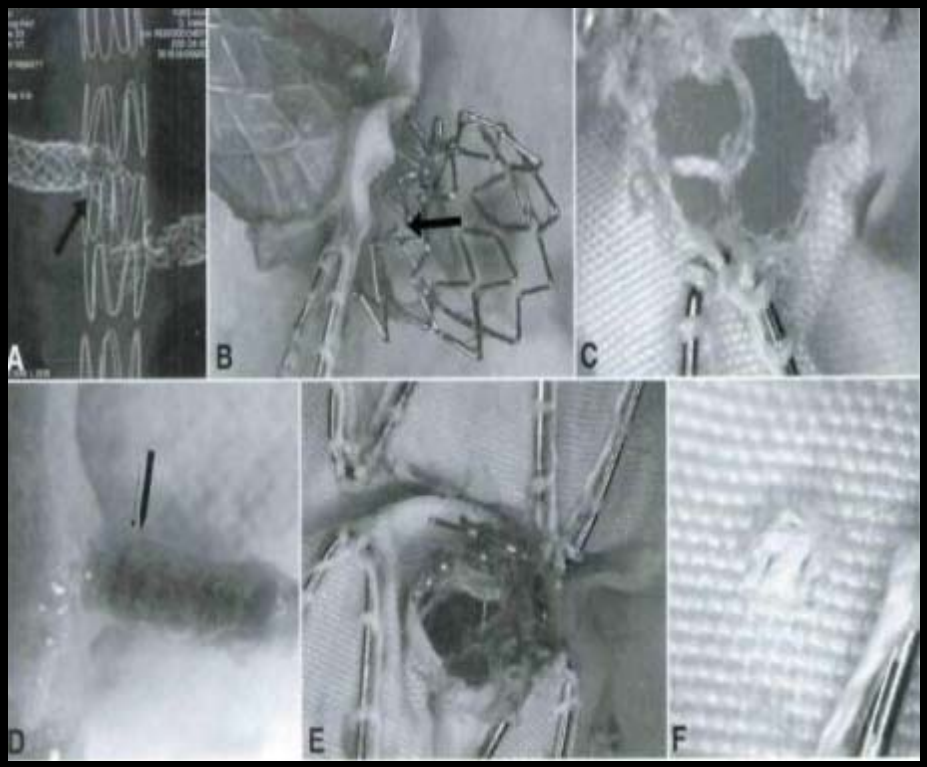
Crossing the pore with .014 wire

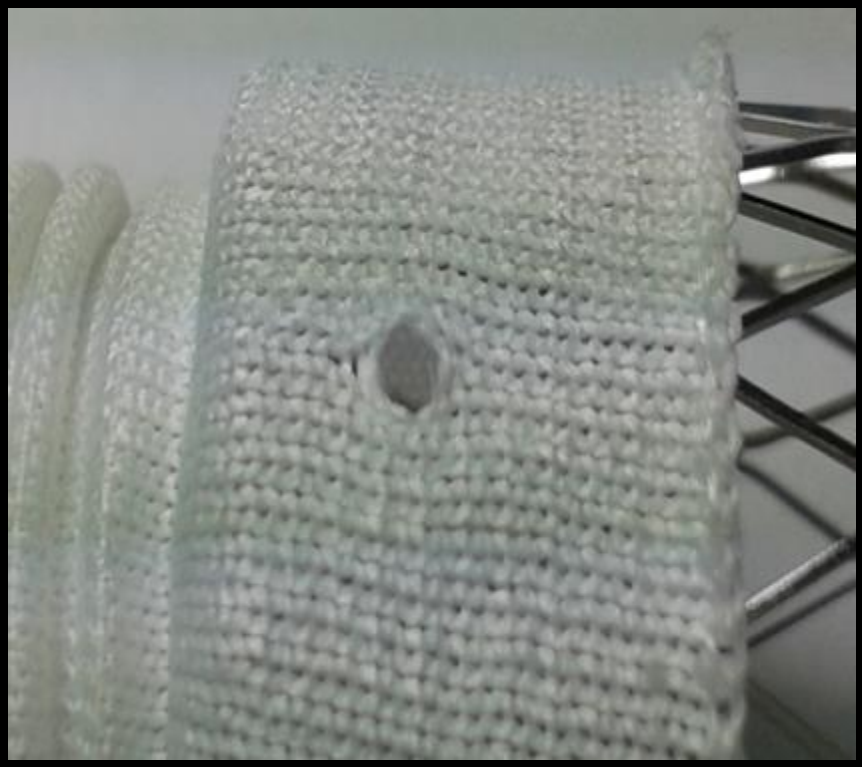


Perforation with Rotablator



Polyester vs SETA





Post fenestration

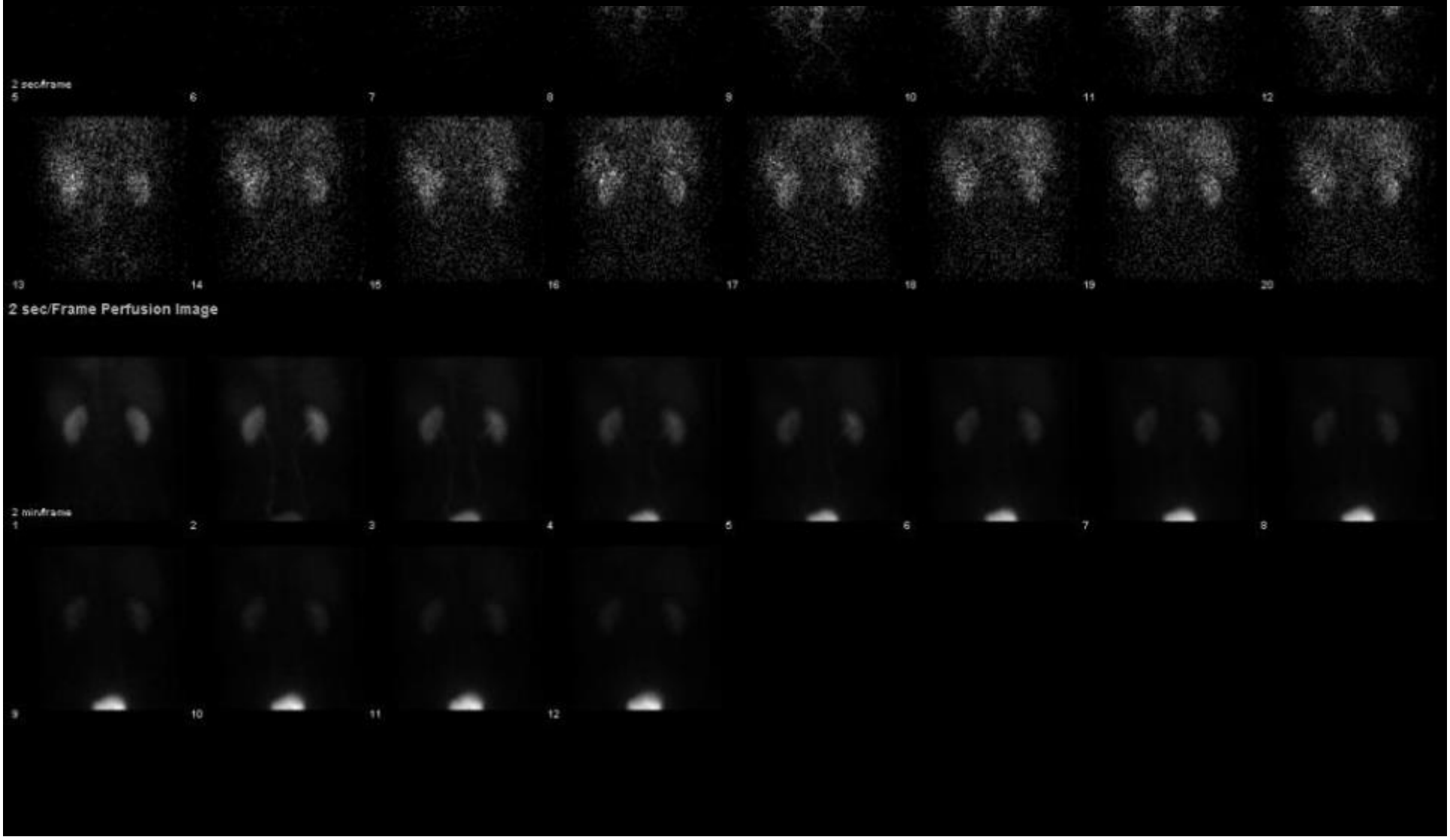
Tears of polyester fibers

No tear of fibers in SETA

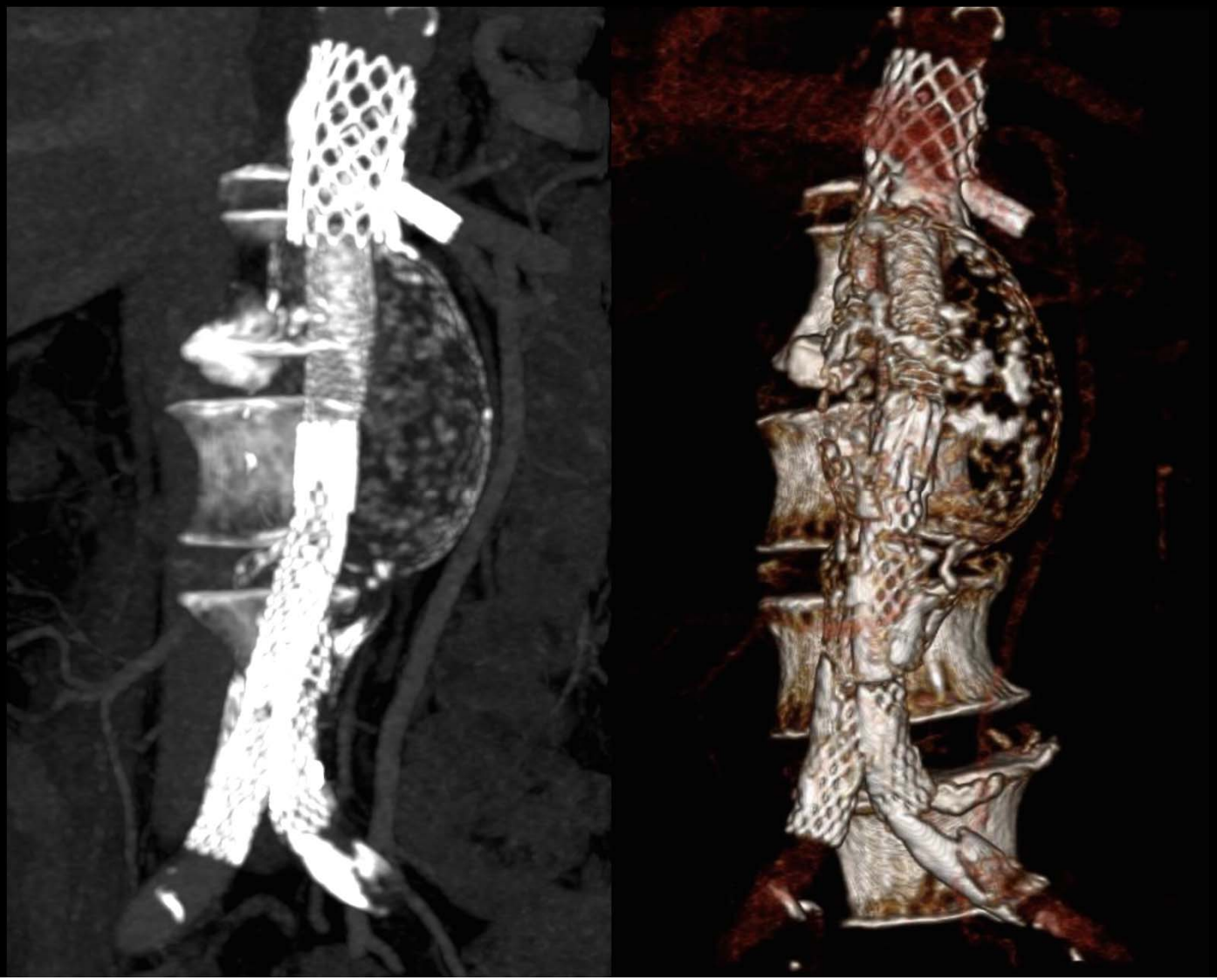
Placement of bridging stent-graft

Completion Aortography

Renal scan pre- and post-IVAF



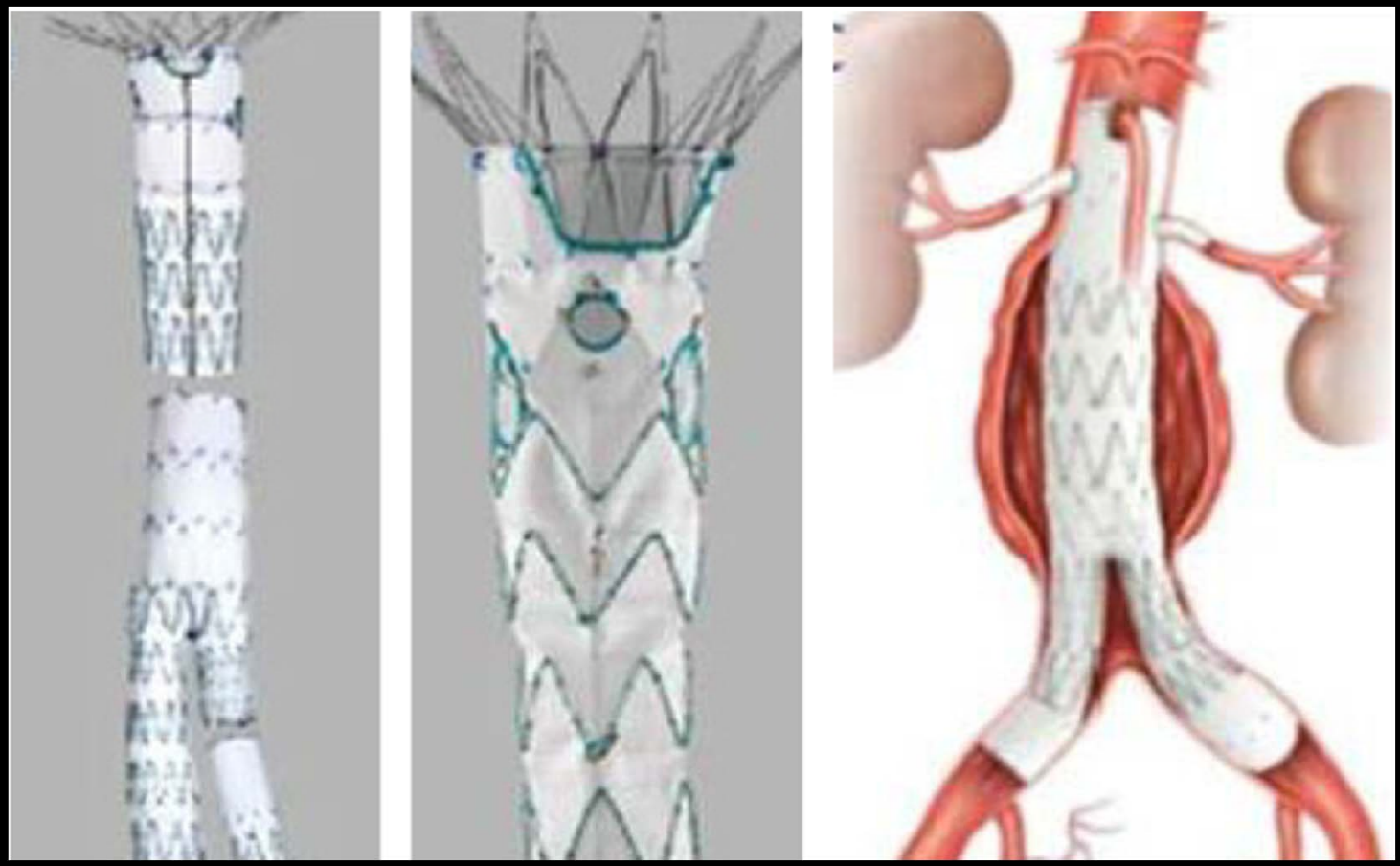
6 months follow-up



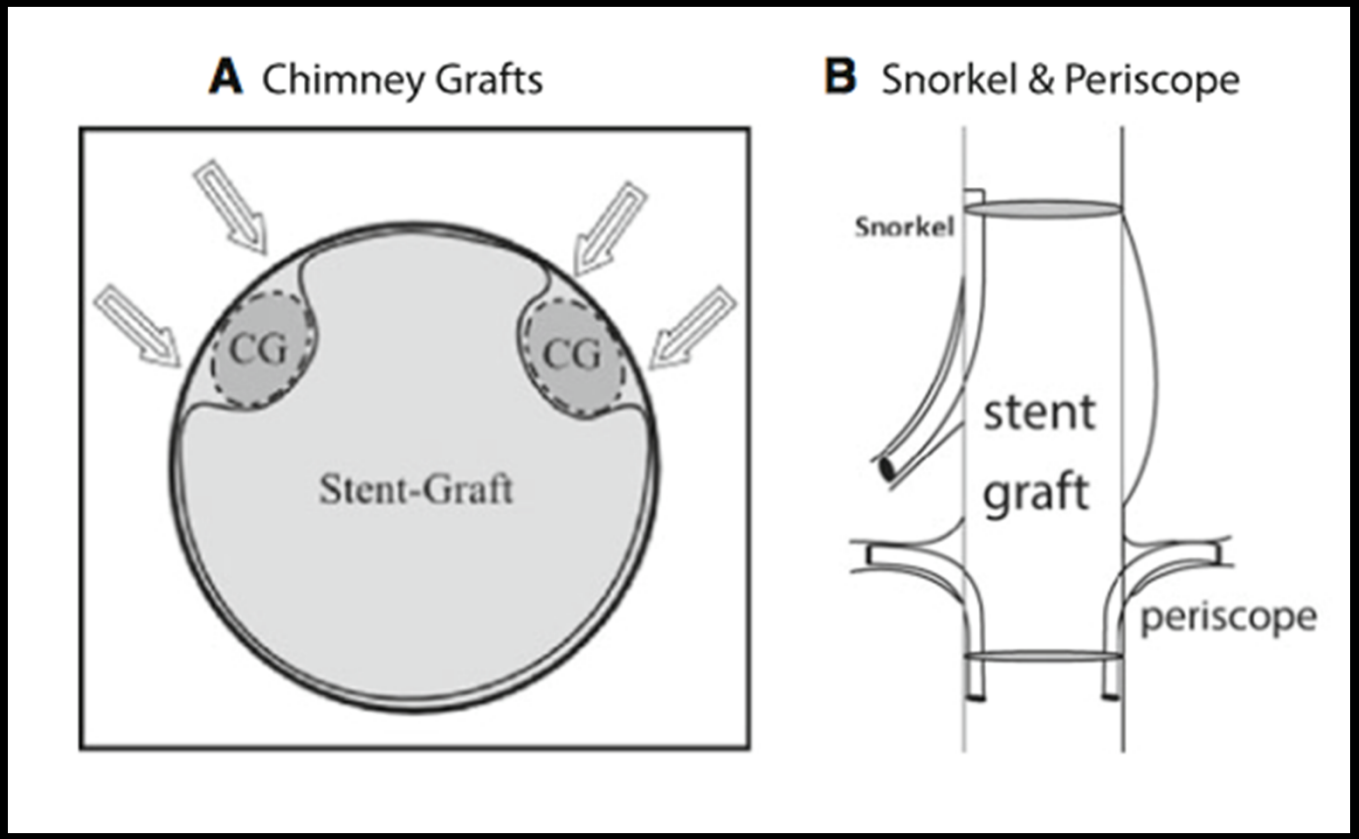
IVAF initial results

- 5 patients (first in April 2014)
- IVAF of single renal artery
- All technically successful
- No leak/migration in 1 year FU (average 6 months)
- All AAAs and the TAAA have decreased in size
- No renal infarct in immediate and 6 months FU CTA
- Creatinine and GFR stable
- Renal scans showed no change in perfusion and function

FENESTRATED vs Chimney Graft



Fenestrated vs CHIMNEY GRAFT



Comparison of Outcomes With Open, Fenestrated, and Chimney Graft Repair of Juxtarenal Aneurysms: Are We Ready for a Paradigm Shift?

Athanasios Katsargyris, MD[1]; Kyriakos Oikonomou, MD[1]; Chris Klonaris, MD, PhD[2]; Ingolf Töpel, MD, PhD[3]; and Eric L.G. Verhoeven, MD, PhD[1,4]

- Open surgery and F-EVAR are two validated techniques to treat JAA

- Ch-EVAR:
  - Has demonstrated feasibility in JAA
    - Current evidence is not enough to support its widespread use in all elective patients.
  - Is justified :
    - In acute patients who are unfit for surgery
    - As a bailout treatment in case of unintentional renal artery coverage
    - In elective patients who are poor candidates for open surgery or F-EVAR

F-EVAR vs Chimneys

- Low leak rate 2-5%
- Target branch patency comparable
- Technically more challenging
- Longer learning curve
- Planning
- Manufacturing time
- No emergency use
- Some migration

- Higher leak rate 5-15%
- Target branch patency comparable
- Easier technically
- Off the shelf devices
- Possible use in emergency cases
- Anecdotal migration

Conclusion

- Very promising technique
- Easy to perform with existing devices
- Reliable
- Can be used in emergency setting
- Small cohort, prospective study in progress
- Eventual protocol to compare costs, efficacy and long term outcome