

# What is an Endoleak?

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# Background

- 75-80% of all abdominal aortic aneurysms are treated with endografts as opposed to open surgery.
- Endoleaks are characterised by persistent blood flow within the aneurysm sac following endovascular aneurysm repair (EVAR).
- Endoleaks are a common complication of EVAR, found in 30-40% of patients intraoperatively and 20-40% during follow-up.

# Clinical Presentation

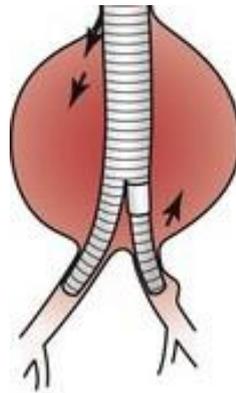
- Often asymptomatic
- Untreated may lead to rupture
- May become evident intra-operatively → years later

# Classification

- Type I: leak at graft attachment site
  - 1a: proximal
  - 1b: distal
  - 1c: iliac occluder
- Type II: aneurysm sac filling via branch vessel
  - IIa: single vessel
  - IIb: two vessels or more
- Type III: leak through defect in graft
  - IIIa: junctional separation of the modular components
  - IIIb: fractures or holes involving the endograft
- Type IV: leak through graft fabric as a result of graft porosity
- Type V: continued expansion of aneurysm sac without demonstrable leak on imaging

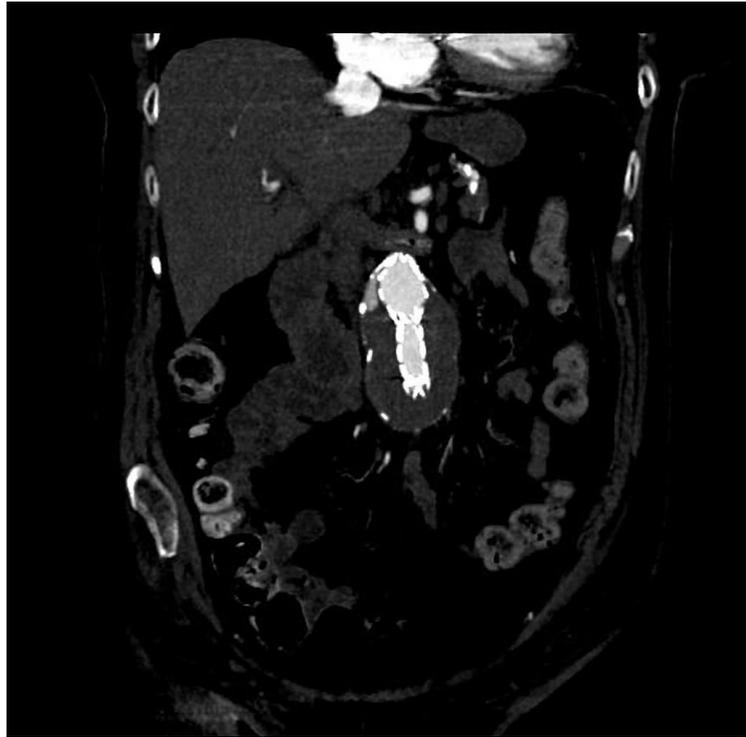
# Type I

- Inadequate seal at site of graft attachment
- Occurs in up to 10% of cases
- Usually the result of unsuitable patient selection
- Can occur secondary to graft migration
- ALWAYS CONSIDERED SIGNIFICANT (unlikely to resolve spontaneously)



Type I

Type Ia



# Type Ic



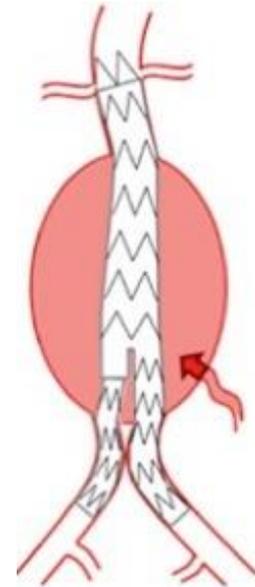
## Procedural Type I Endoleak Treated by Ballooning



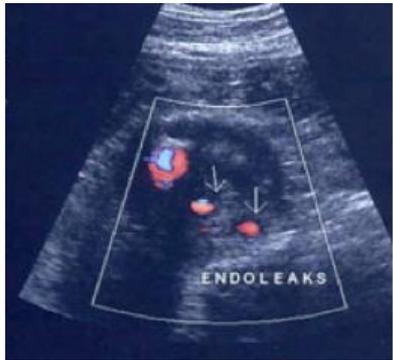
*Courtesy of: Makaroun, Michel; Management of Endoleaks after EVAR*

# Type II

- Most common after EVAR
- Retrograde flow through branch vessels continue to fill aneurysm sac
- Most common:
  - Lumbar arteries
  - Inferior mesenteric arteries
  - Internal iliac artery
- Type II leaks seen in up to 25% of cases
- Usually resolves spontaneously
- Embolization may be indicated



# Type II

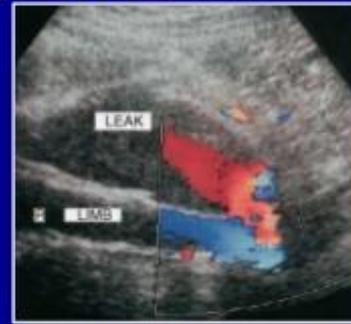


## Types of endoleak

Type I: Proximal attachment site



Type I: Distal attachment site



Type II: Inferior mesenteric artery



Type II: Patent lumbar artery

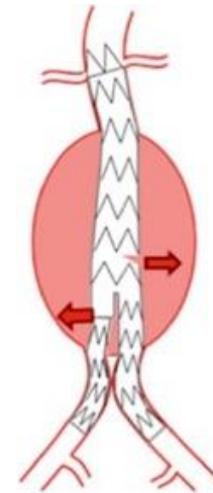


Thrush A et al. Peripheral vascular ultrasound. Elsevier, London, 2<sup>nd</sup> edition, 2005.

Hartshorne T. Ultrasound 2006 ; 14 : 34 – 42.

# Type III

- Mechanical failure of stent-graft
  - Fracture
  - Hole
  - Defect in graft fabric
  - Junctional separation
- Can be exacerbated by extreme angulation of a segment of graft or improper overlap during insertion

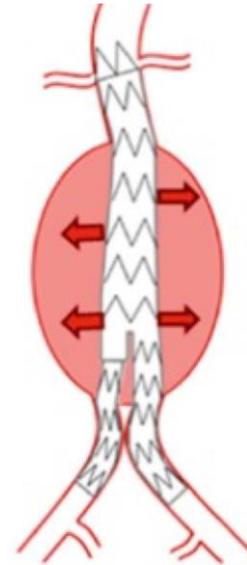


# Type III



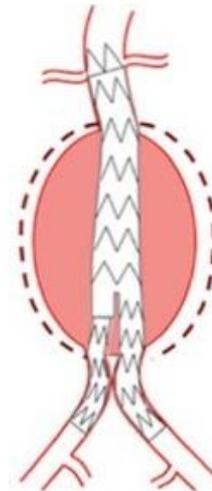
# Type IV

- Blood leaks across graft due to porosity
- Does not require any treatment
- Typically resolves spontaneously



# Type V (endotension)

- Not a true leak
- Continued expansion of aneurysm sac without evidence of leak
- Thought to be secondary to transmission of pulse wave through perigraft space



# Summary

- Endoleaks represent one of the most common complications following EVAR
- Type I endoleaks represent the greatest risk for rupture
- The vascular laboratory is a valuable resource in detecting and in some cases, identifying the type of endoleak