Thoracic Aortic Saccular Aneurysms

How to Measure Diameter and When to Repair

Nicholas Peti BSc, MD, FRCSC

nicholaspeti@gmail.com

WVES - 2026

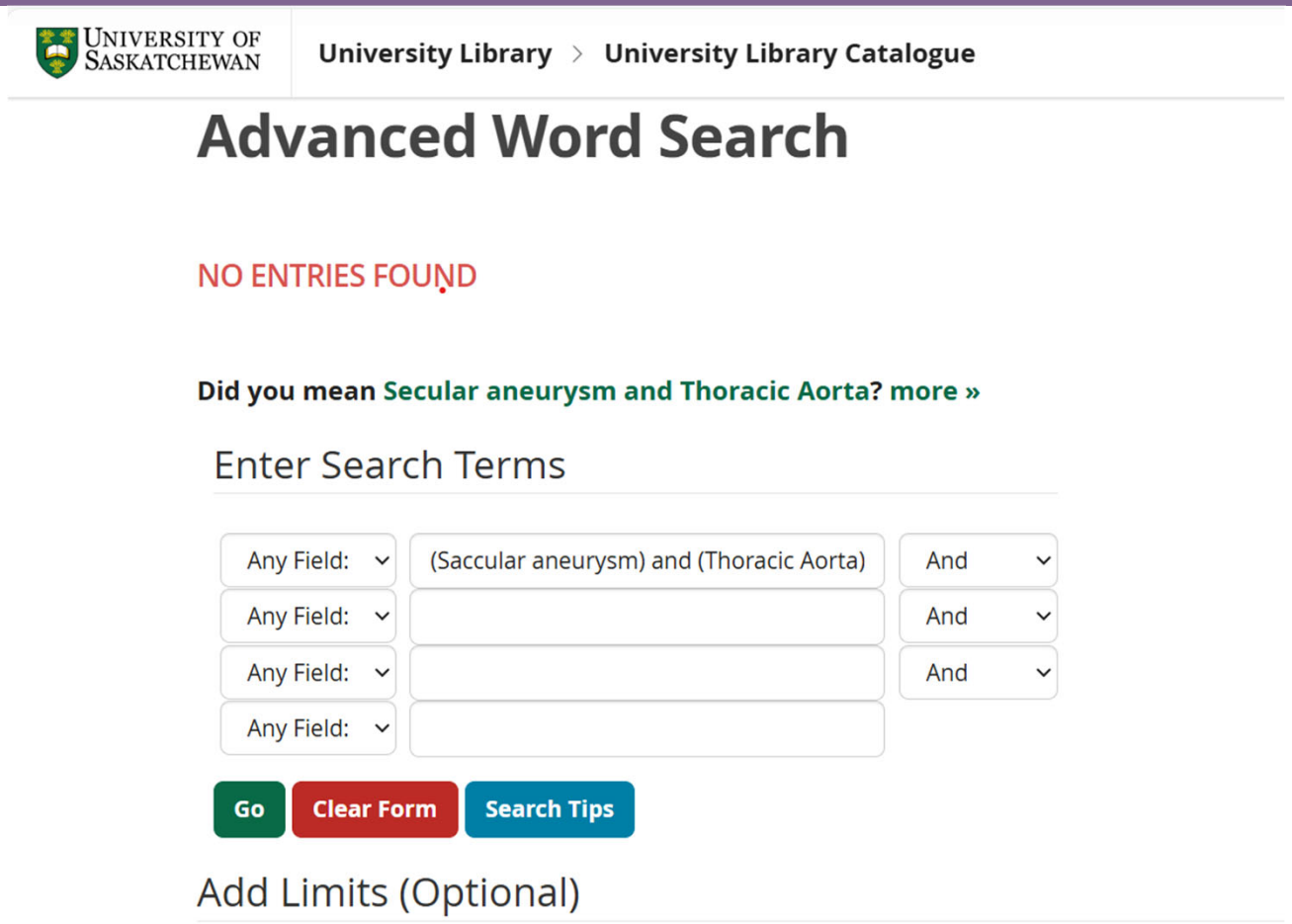
WVES | Winnipeg Vascular & Endovascular Symposium

Presenter Disclosure

Nicholas Peti

- I have no current relationships with commercial entities

LIMITED CLEAR EVIDENCE – NOT AS EASY AS CHOOSING CEA!



The Evidence on When to Treat Saccular aneurysms

- Limited – somewhat controversial
- There is evidence that *wall stress* is increased in saccular vs fusiform aneurysms[1] at a smaller size
- Size is still the most widely accepted accept risk for rupture
- Saccular aneurysms are often fixed at a smaller size and assumed to be higher risk for rupture (including by myself) but this is not well established in the literature
- 10 year review published in 2023 of TEVAR in TAA in JVS[2]
  - 37% of TEVARs were for Saccular TAA in 655 Urgent or Emergent TEVARs
  - 35% of TEVARs were for Saccular TAA in 1352 Elective TEVARs
  - In symptomatic TAA – Saccular aneurysms were much more likely to be below 5 cm than Fusiform in women (38% vs 10%) and below 5.5 cm in men (47% vs 21%) suggesting a higher risk morphology at smaller size

Saccular Aortic Pathology[5]

- 81% Atherosclerotic/Degenerative
- 68% in the descending thoracic aorta vs 24% Abdominal Aorta
- While Shangs' study suggested similar growth rate to fusiform aneurysms[5] other studies have show saccular aneurysms of the DTA are more likely to present with symptoms, and rupture at a smaller size[2]

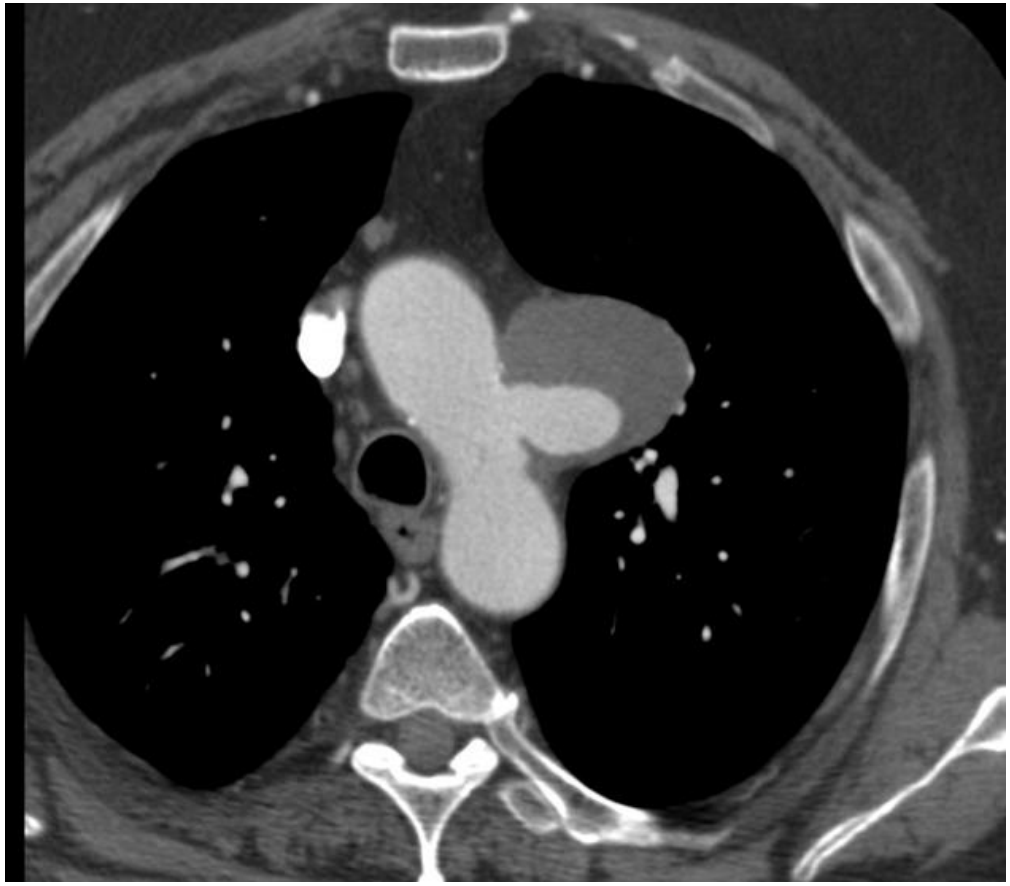
SACCULAR ANEURYSM DOES NOT MEAN

- This is not a pseudoaneurysm, PAU, Dissection etc which all have different indication for repair
- Separately – must rule out mycotic aneurysm – as while most saccular aneurysms are not mycotic – up to 93% of mycotic aneurysms may have a saccular appearance[3]

GUIDELINES – SVS – JVS 2021[3]

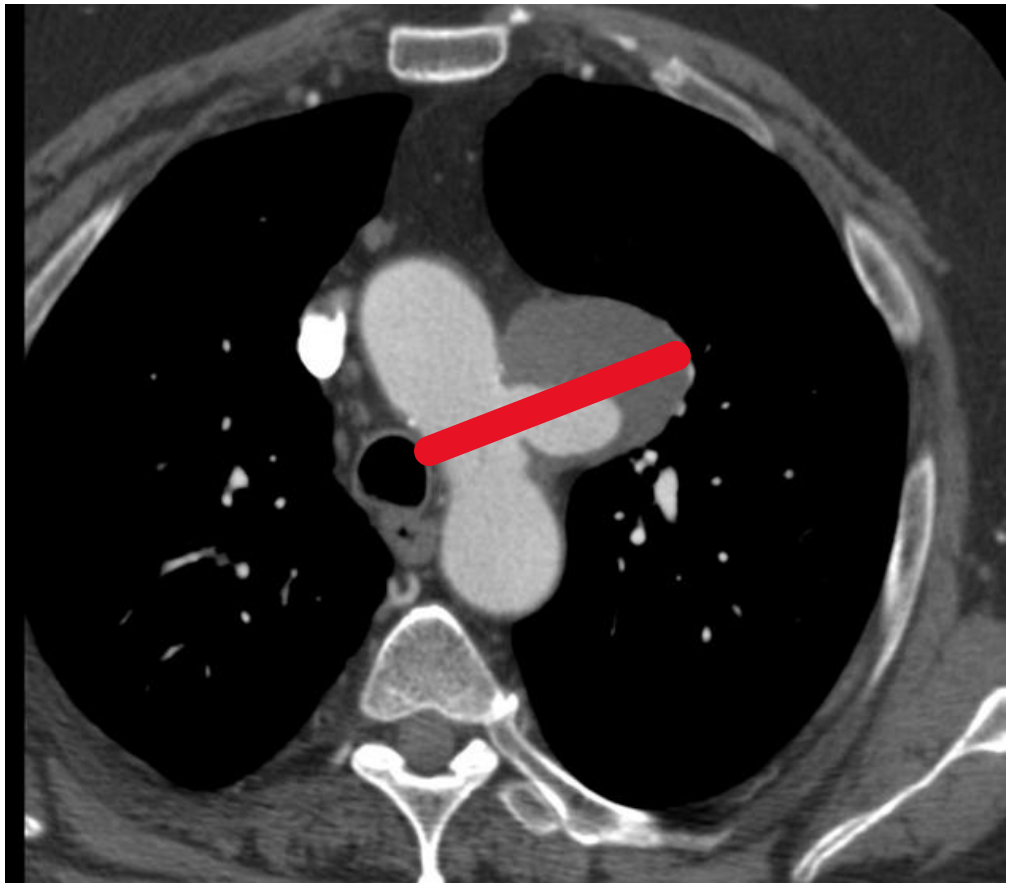
- TEVAR may be justified at a diameter < 6 cm though high-quality data lacking
- Some previous guidelines suggested repair of all high-risk aneurysms – including “Saccular” regardless of size[4] but this is likely too aggressive a stance

How to measure[6]?



How to Measure[7]?

- Likely at right angle to the direction flow



Take Home

- There is less clear evidence on when to treat saccular aneurysms
- VQI and other databases provide an opportunity to study less classic cases!
- Saccular aneurysms likely represent a (slightly) higher risk morphology
  - Treat at a smaller size?
  - Treat if symptoms
  - Follow up
  - Continue to study … certainly seems an opportunity for AI and machine learning to identify size, and high-risk characteristics at presentation in rupture and symptomatic cases

REFERENCES

1. Nathan, Xu et al *Increased Wall Stress of Saccular Versus Fusiform Aneurysms of the Descending Thoracic Aorta.* Annals of Vascular Surgery. Volume 25, Issue 8, November 2011, Pages 1129-1137
2. Rastogi, Vinamr et al. *Clinical presentation, outcomes, and threshold for repair by sex in degenerative saccular vs fusiform aneurysms in the descending thoracic aorta* Journal of Vascular Surgery, Volume 78, Issue 6, 1392 - 1401.e1
3. Upchurch, Escobar et al. *SOCIETY FOR VASCULAR SURGERY PRACTICE GUIDELINES.* Journal of Vascular Surgery Volume 73, Issue 1, Supplement 55S-83SJanuary
4. Hollier, L.H. · Taylor, L.M. · Ochsner, J. **Recommended indications for operative treatment of abdominal aortic aneurysms**Report of a subcommittee of the Joint Council of the Society for Vascular Surgery and the North American Chapter of the International Society for Cardiovascular Surgery *J Vasc Surg.* 1992; **15**:1046-1056
5. Shang, Eric K. et al. *A modern experience with saccular aortic aneurysms.* Journal of Vascular Surgery, Volume 57, 2013 Issue 1, 84 – 88
6. Thoracic aortic aneurysm | Radiology Reference Article | Radiopaedia.org
7. Thoracic aortic aneurysm: Optimal surveillance and treatment | Cleveland Clinic Journal of Medicine