



Feasibility of Endovascular Arch Repair After Surgery For Type A Acute Aortic Dissection.

Insights For A Lifetime Management of Aortic Dissection



AATS

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Background

- Endovascular repair of the aortic arch with branched stent-grafts (Ar-TEVAR) has shown good early and mid-term results
- Ar-TEVAR may be a viable option for patients with history of surgery for type-A acute aortic dissection (TAAAD) due to the proximal landing in a vascular graft and reduced invasiveness
- Ar-TEVAR is not always feasible due to anatomical limitations

Aim of the study

- The aim of this retrospective, multicenter study was to assess Ar-TEVAR feasibility with two devices (single and double-branch) in patients with a history of surgery for TAAAD and to identify reasons for infeasibility, particularly those modifiable during the first operation (e.g. a short ascending graft) in order to enhance Ar-TEVAR feasibility rate.

Methods (1)



- Study period: January 2012 – September 2023
- Two study sites
- Inclusion criteria
 - Surgery limited to ascending and/or hemiarch replacement (with no reimplantation of any supra-aortic vessel) at first operation
 - Pre-discharge angio-CT scan available and of good quality
- Exclusion criteria
 - No adequate postoperative angio-CT scan
 - No residual aortic arch dissection, total arch replacement (or reimplantation of at least one supra-aortic vessel)

Methods (2)



- Primary endpoint
 - Evaluation of Ar-TEVAR feasibility with the two study devices
- Secondary endpoint
 - Identification of the causes of infeasibility overall and separately for the two study devices
- Pre-discharge angio-CT scans were analyzed by two independent evaluators and feasibility was assessed according to the anatomical requirements of each device provided by the manufacturers

Study devices



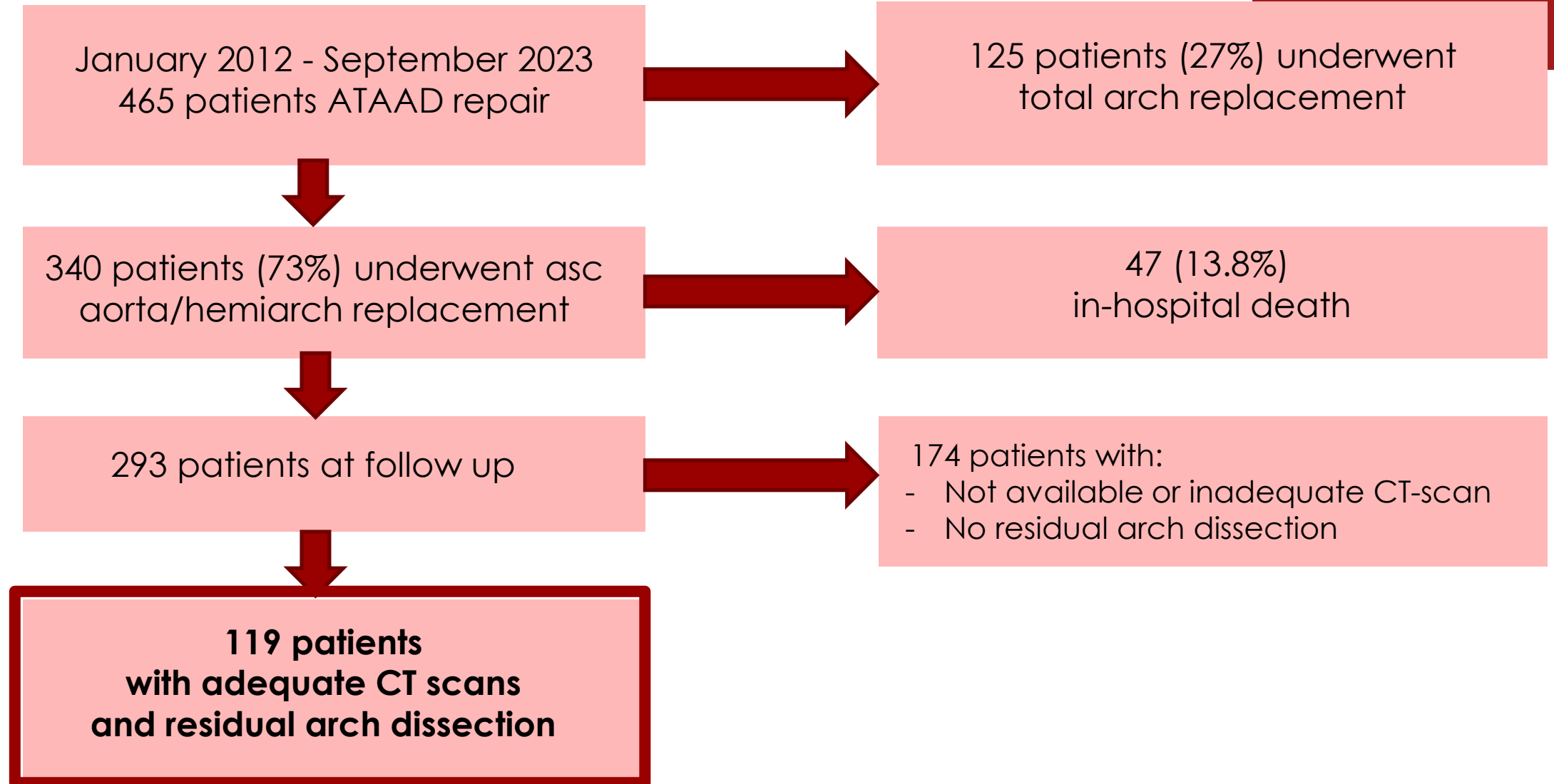
- Single-branch
- Off-the-shelf
- Dual module



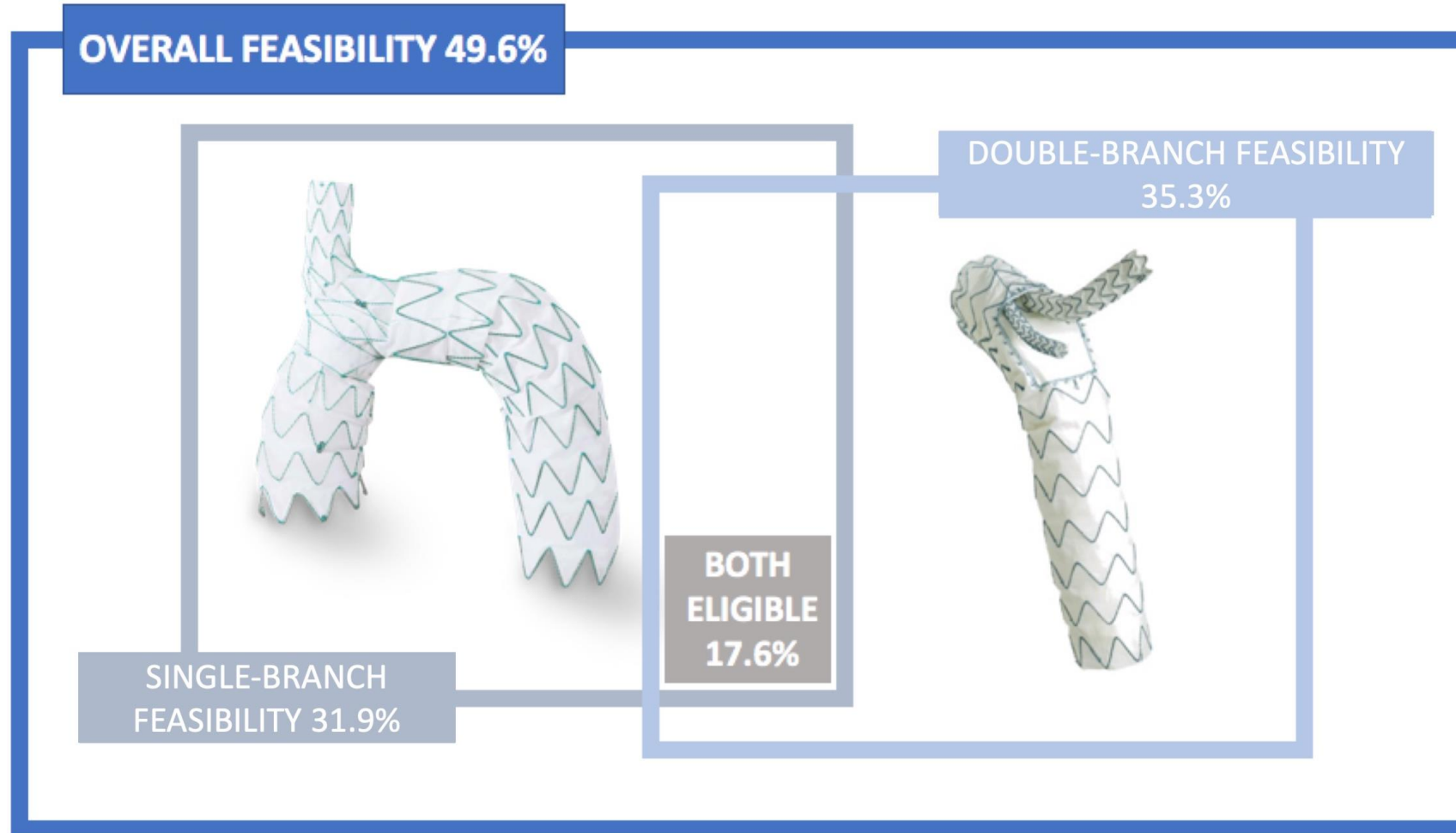
- Double-branch
- Custom made



Results (1)



Results (2)



Results (3)



Single-branch feasibility

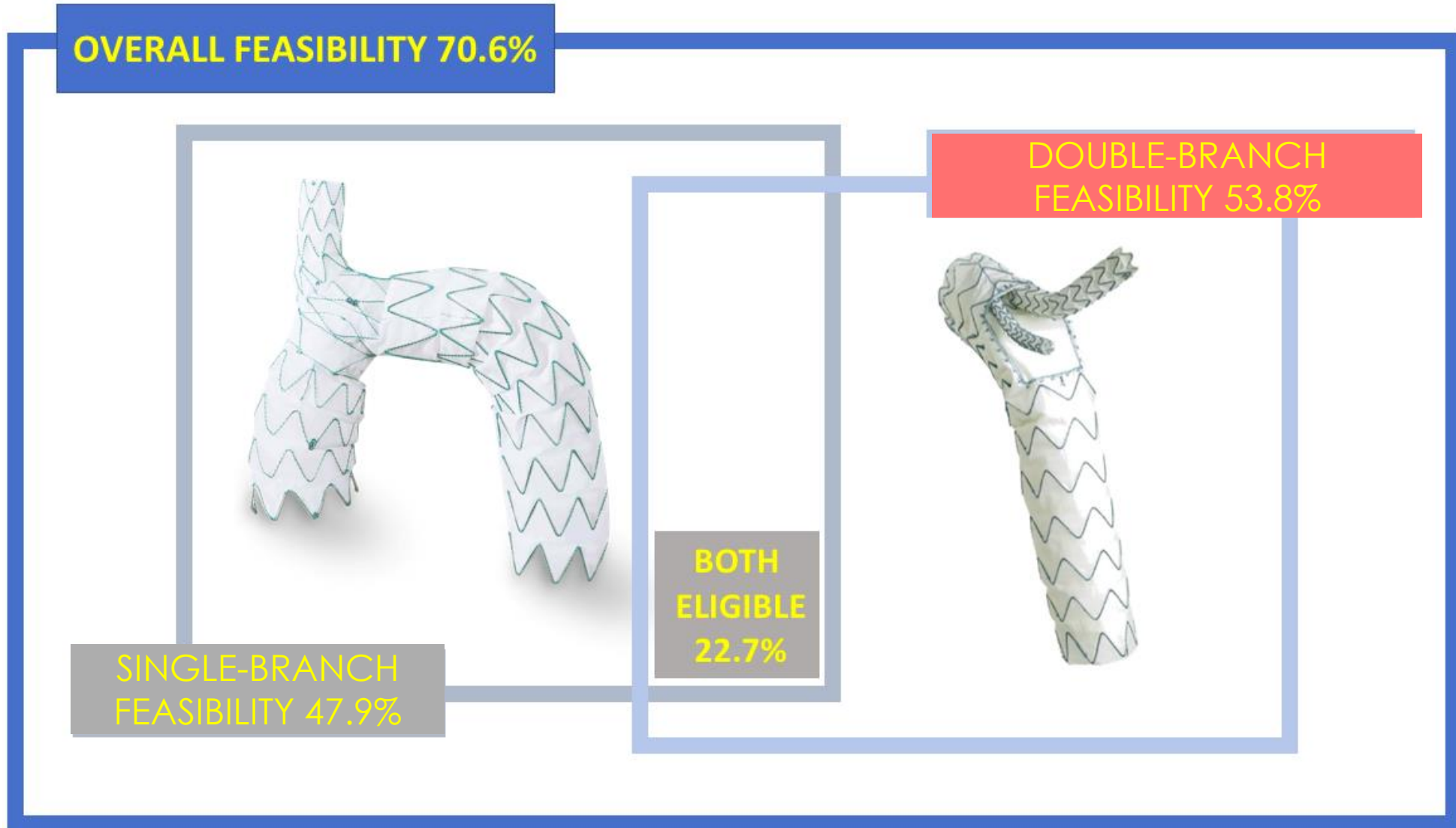
Feasible	38	31.9%
Inside IFU	34	89.5%
Outside IFU (LSA branch)	4	10.5%
Not Feasible	81	68.1%
Unsuitable Proximal Landing Zone	39	48.1%
Length of Ascending Aorta	33	84.6%
Diameter at SPS	7	17.9%
Mechanical valve	2	5.1%
Isolate Unsuitable Proximal Landing Zone	19	37.0%
Unsuitable Supra-Aortic Vessels	45	55.6%
BCT Dissected	28	62.2%
LSA Dissected	17	37.8%
Alfa angle	9	20.0%
Isolate unsuitable for Supra-Aortic Vessels Dissection	23	29.6%



Double-branch feasibility

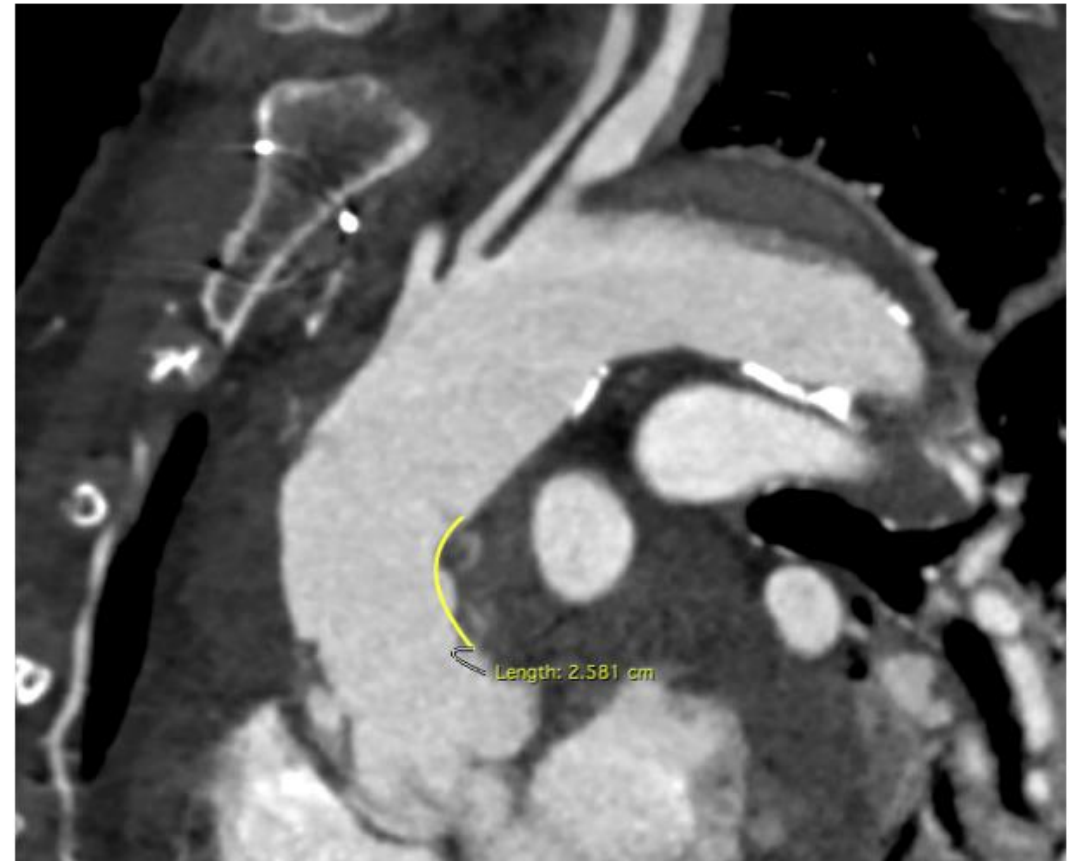
Feasible	42	35.3%
Not Feasible	77	64.7%
Unsuitable Proximal Landing Zone	53	68.8%
Length of Ascending Aorta	37	69.8%
Kinking of Ascending Aorta	21	39.6%
Mechanical valve	2	3.8%
Isolate Unsuitable Proximal Landing Zone	22	28.6%
Unsuitable Supra-Aortic Vessels	45	58.4%
All 3 Vessels Dissected	28	62.2%
BCT uninjured, but LSA and LCCA involved	17	37.8%
Isolate unsuitable for Supra-Aortic Vessels Dissection	24	31.2%

Potential feasibility with ascending graft of appropriate length



SURGICALLY MODIFIABLE FACTORS

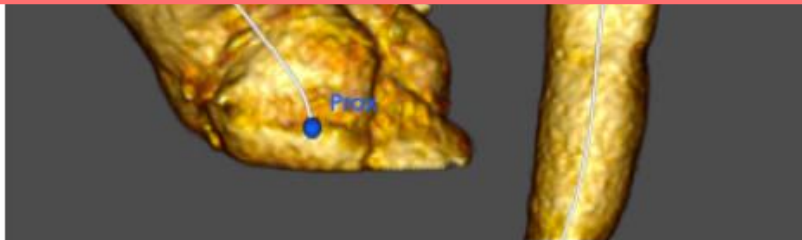
→ IMPROVING FEASIBILITY OF PROXIMAL LANDING ZONE



SURGICALLY MODIFIABLE FACTORS

→ IMPROVING FEASIBILITY OF PROXIMAL LANDING ZONE

OVERALL, 41.7% OF THE POPULATION WAS
DEEMED INELIGIBLE SOLELY DUE TO AN
INADEQUATE PROXIMAL LANDING ZONE.



Conclusions

- Ar-TEVAR with Single-branch and Double-branch stent-grafts is feasible overall in nearly half of patients with a history of surgery for TAAAD
- Unsuitable proximal landing zone and unsuitable supra-aortic vessels were the main causes of infeasibility
- A short ascending graft made one third of patients unsuitable
- If surgeons implant a longer ascending graft, feasibility may increase up to two thirds of patients
- **Take-home message:**
 - *Lifetime management of patients with TAAAD commences at the time of the first operation with appropriate operative planning and optimal surgical strategy*