

Outcome of thoracic endovascular aortic repair with single aortic arch chimney in high risk patients.

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Disclosure

Speaker name:

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I do not have any potential conflict of interest

Purpose

- Reporting our experience, selection criteria and outcome of single AAC.
- Preferable method in high risk patient with decreasing to gutter area related endoleak in multiple chimney stent grafts.

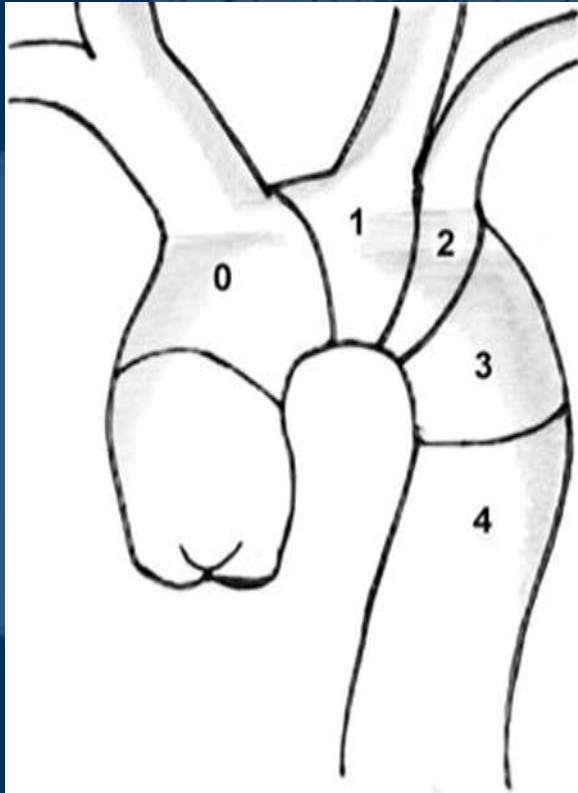
Patients and Methods

- A retrospective , Single center study (2012 - 2016).
- Gangnam Severance Endovascular Aortic Registry (332 patients whose aortic pathology managed by TEVAR).
- 24 patients underwent Single AAC TEVAR at our hybrid operation room.
- The indication for treatment (aortic aneurysm, Aortic dissection (Debakey I and III) and trauma (type I-IV)
- Both planned and unplanned chimney was included in this study.

Planning and selection

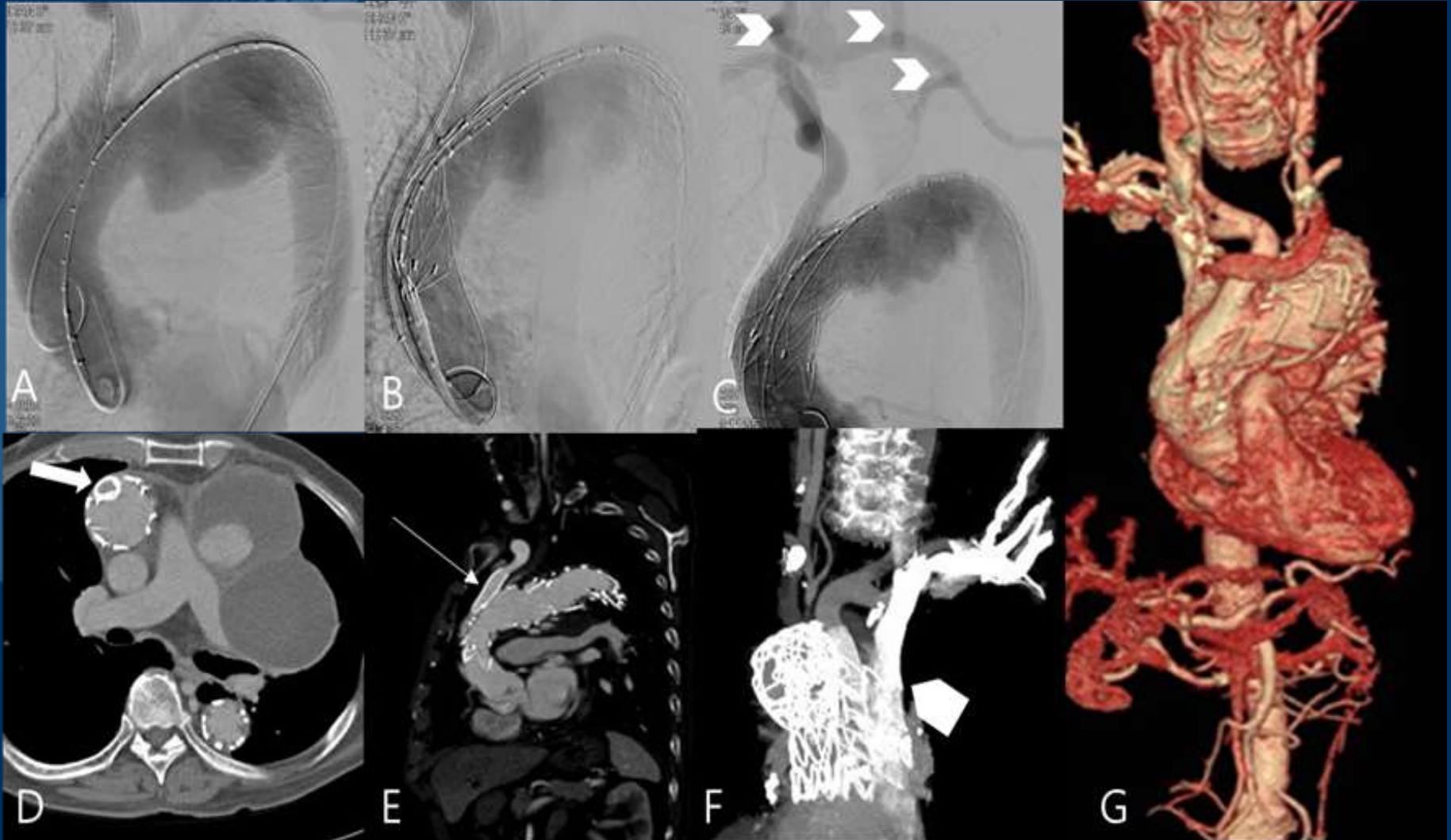
Patients

Ishimaru classification

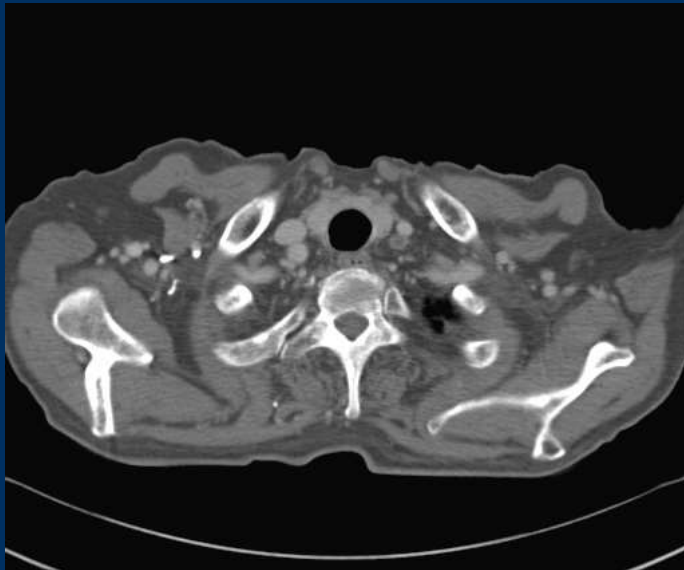


- ✓ Comorbidities (age >65 years, coronary artery disease, heart failure, chronic obstructive disease, and impaired renal function)
- ✓ Anatomical characteristics (thoraco-sternotomy incision and two stage open repair)
- ✓ Risk for anticoagulation as in trauma patients.
- ✓ Combined both chimney and bypass in those with challenging anatomy.

Clinical practice zone 0 AAC



Zone 0 AAC



Results

Table I. Patients characteristics and demographic data

	Zone 0 N= 4	Zone 1 N= 1	Zone 2 N= 19
Age (SD)	69.0 (10.9)	72	51.9 (19.8)
Males (%)	4 (100)	1 (100)	17 (89.5)
BMI (SD) (kg/m2)	23.6 (3.3)	24.2	24.4 (2.5)
Comorbidities			
HTN (%)	4 (100)	1 (100)	8 (42.1)
Smoking (%)	3 (75)	1 (100)	9 (47.4)
Obesity (%)	1 (25)	0	4 (21.1)
CAOD (%)	1 (25)	0	6 (31.6)
CVA (%)	1 (25)	0	5 (26.3)
CRF (%)	0	0	3 (15.8)
Pathology			
Aneurysm (%)	3 (75)	1 (100)	3 (15.8)
Dissection (%)	1 (25)	0	6 (31.6)
Trauma (%)	0	0	10 (52.6)
Prior aortic surgery	1 (25)		2 (10.6)
Clinical presentation			
Elective (%)	3 (75)	1 (100)	4 (21.1)
Emergency (%)	1 (25)	0	15 (79.9)

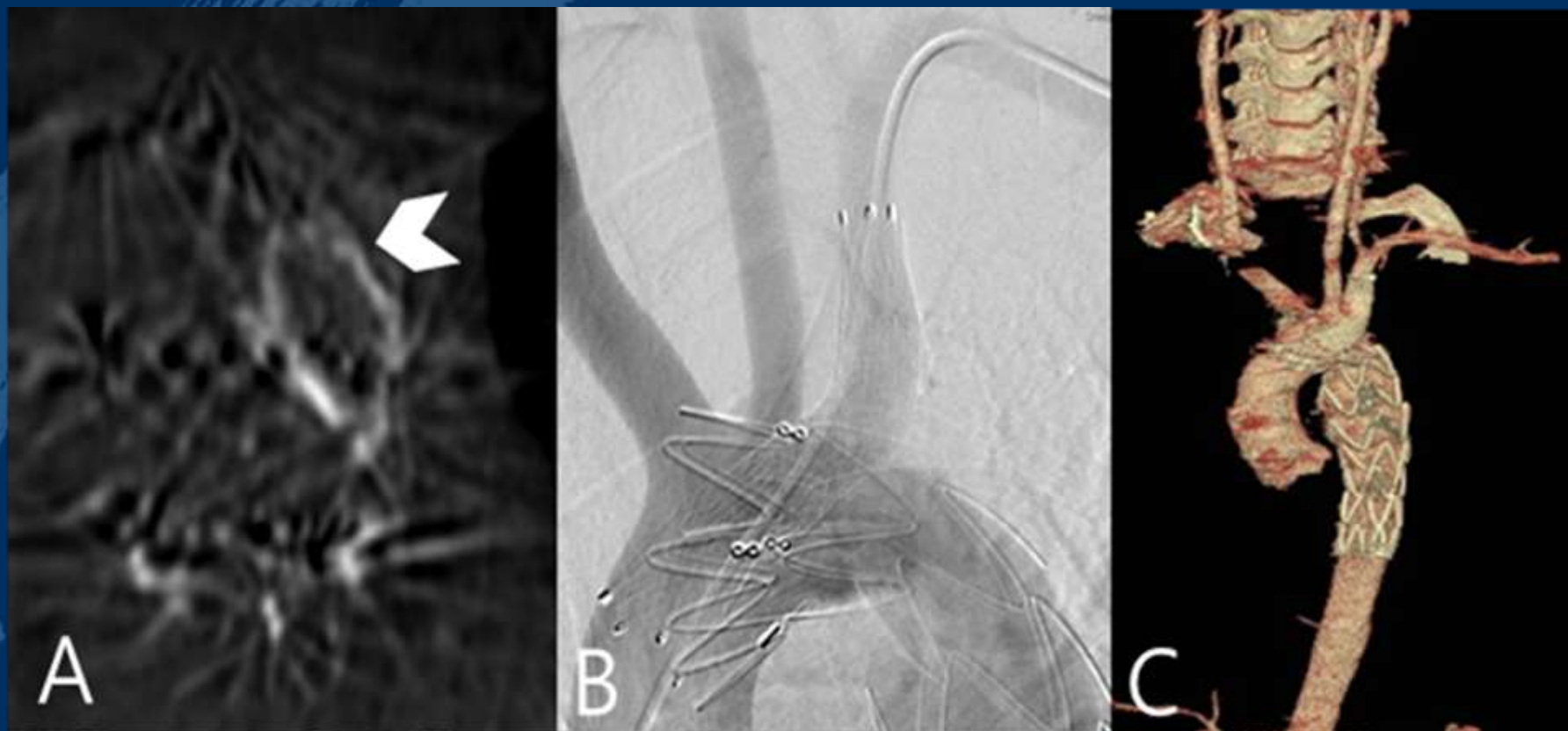
Table II. Procedure details

	Zone 0	Zone 1	Zone 2
	N= 4	N= 1	N= 19
Procedure time (min) (SD)	372 (167)	210	119 (63)
CSF drainage (%)	1 (25)	0	3 (15.8)
General Anesthesia (%)	4 (100)	1 (100)	17 (89.5)
Company			
COOK (%)	0	1 (100)	13 (68.4)
Medtronic (%)	4 (100)	0	6 (31.6)
Chimney insertion scenario			
planned	4 (100)	0	18 (94.7)
Unplanned	0	1 (100)	1 (5.3)
Types of chimney stent			
Iliac Limb	3 (75)	0	0
Stent graft	1 (25)	1 (100)	15 (79.9)
Stent graft+ bare metal stent	0	0	3 (15.8)
Self-expandable stent	0	0	1 (5.3)
Adjunctive procedures			
Open access	0	1	3
Prior de-branching bypass grafts (n)	4	1	1
Technical success (%)	4 (100)	1 (100)	19 (100)

Table III. In hospital and follow up outcome.

	Zone 0	Zone 1	Zone 2
	N= 4	N= 1	N= 19
30 days outcome			
Mortality (%)	1 (25)	0	0
Stroke (%)	0	0	1 (5.3)
Paraplegia (%)	0	0	0
Respiratory failure (%)	1 (25)		1 (5.3)
Renal failure (%)	0	0	1 (5.3)
ICU (SD) (hours)	189 (249)	28	168 (195)
Length of hospital stay (SD) (days)	17.8 (11.4)	9	31.7 (28.3)
Follow up outcome			
Late surgical conversion (%)	0	0	1 (5.3)
Endoleak (%)	0	0	3 (15.8)
Re-intervention (%)	1 (25)	0	3 (15.8)
Patency of chimney stents (%)	4 (100)	1 (100)	18 (94.7)

Re-intervention



Complicated Case



Discussion

Open Repair

- Extensive Aortic aneurysm is a complex problem

But it can be managed safely.

Safi et al, Ann Surg 2014

Total endovascular repair

Selected cases

- Anatomic suitability
- Material availability
- Costs
- X-ray exposure
- Follow up?



Figure 4. The Bolton Medical dual-branch aortic arch stent graft.

Hybrid surgery

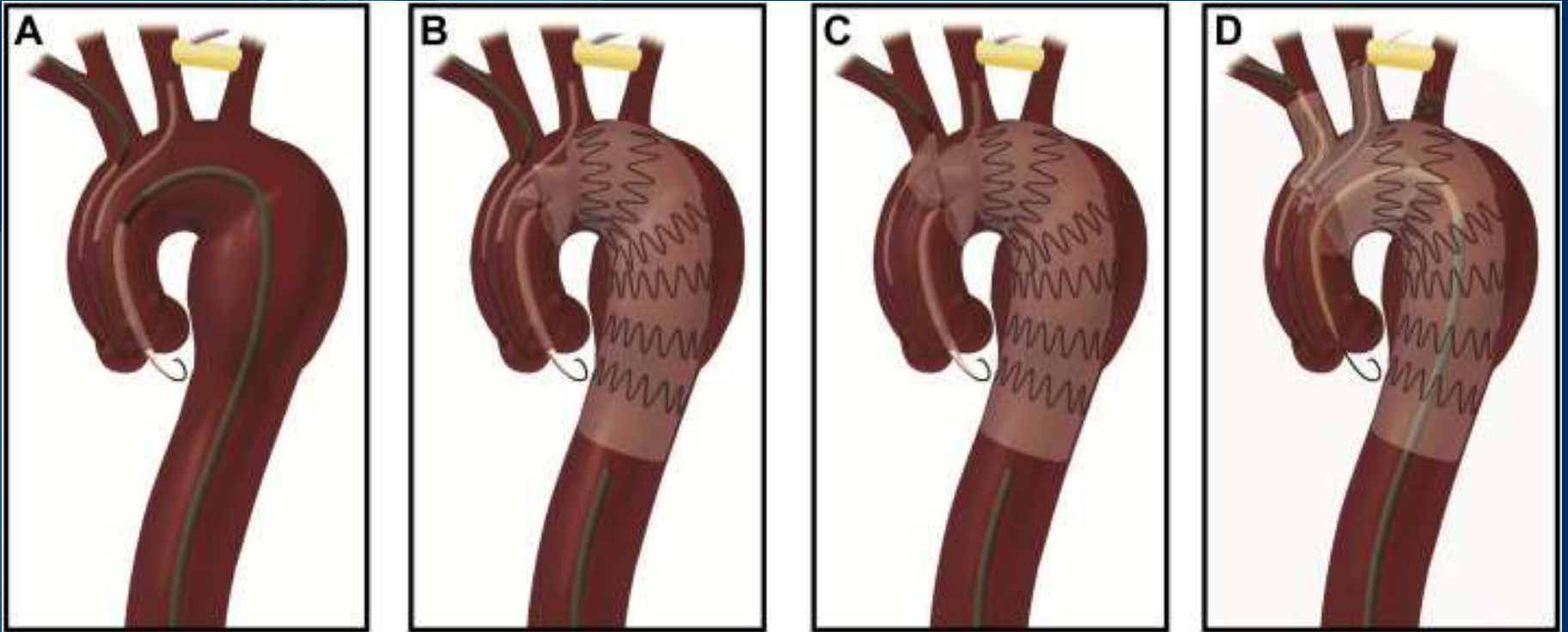
Open Surgery +

Endovascular Repair

“The way to a wider application
of endovascular technology
for management of complex
aortic disease”



Aortic Arch Chimney TEVAR



AAC appeared to be acceptable less invasive treatment strategy in our high risk patients especially emergency situations.

A current systematic evaluation and meta-analysis of chimney graft technology in aortic arch

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Chimney
Useful

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✓ Although, we did 67% of our procedures under emergency situation, our technical success was 100% perioperative overall mortality and neurological event was one patient (4.1%) for each.

Gutter endoleak

- TunWang et al, 26 reported that double chimney was associated with gutter endoleak in 13% that require re intervention.
- The largest published experience of AAC stents with TEVAR for zone 0 and zone 1 they had 11% endoleak and their re-intervention rate of (33%) that was contributed by them to the use of more than one AAC. (Igor Voskresensky et al, J Vasc Surg 2017; 66 (1): 9-20.-3)
- Our study had 3 endoleaks but no intervention for gutter area endoleak.

Home message

- Single AAC is safe and effective in high risk patients both for zone 0 and zone 2.
- single chimney decreasing rate of gutter area endoleak and of benign nature that sealed with cessation of anticoagulant.