

The logo for LINC (Lung Injury Network for Critical Care) features a stylized graphic of a lung or flame in red and orange, with the letters 'LINC' in white to its right.

LINC

Individualized patient decision making promotes favorable outcomes in endovascular therapy for blunt traumatic aortic injury

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Disclosure

Speaker name:

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I do not have any potential conflict of interest

Purpose

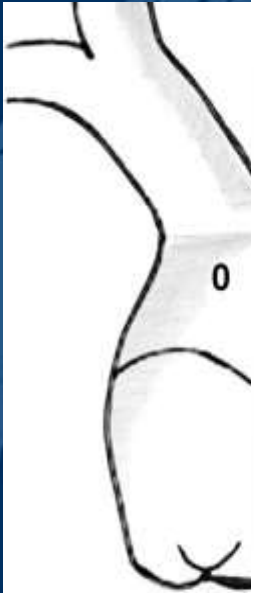
- We aimed to analyze our procedure details and managing complications .
- Highlight our favorable outcomes and correlate this outcome to our procedure concepts.

Patients and Methods

- A retrospective , Single center study (2012 - 2016).
- Gangnam Severance Endovascular Aortic Registry (332 patients whose aortic pathology managed by TEVAR).
- 29 patients underwent TEVAR for TAI (blunt traumatic injuries).
- TEVAR underwent at our hybrid operation room.

Planning and scoring

Ishimaru



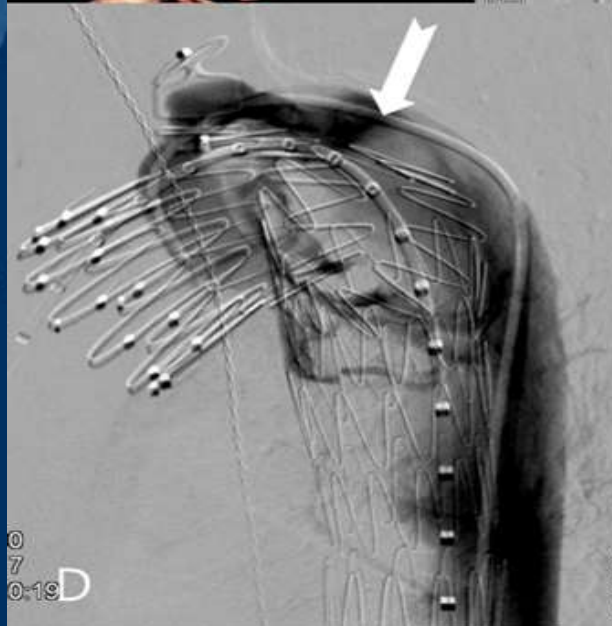
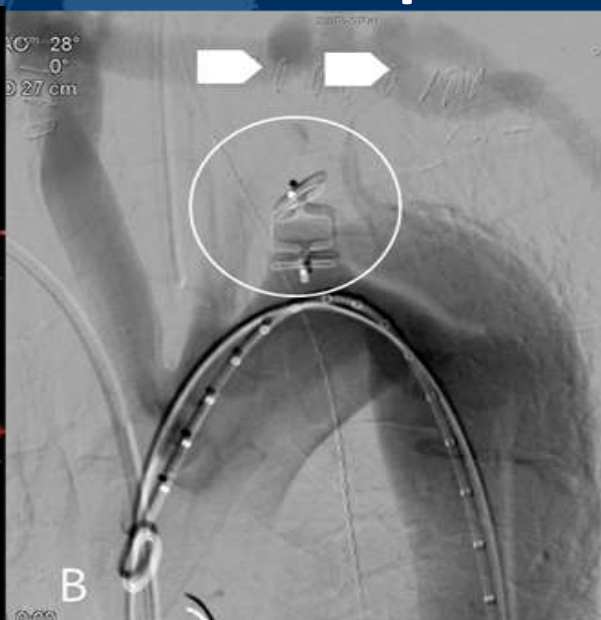
Injury Severity Score (ISS)

$$\text{ISS} = \text{sum of 3 highest}^2\text{AIS} \\ = a^2 + b^2 + c^2$$

Region	Injury Description	AIS score	Square Top Three
Head & Neck	Lacerate wound	2	4
Face	No Injury	0	0
Chest	Flail Chest	4	16
Abdomen	No injury	0	0
Extremity	Fractured femur	3	9
External	Contusion	1	1
Injury Severity Score:			29

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Clinical practice



21
Am 11:20 min



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Results

Table I. Patients characteristics and demographic data

Variables	N (%)
Age (SD)	43.21 ± (15.63)
Males	29 (100)
BMI (SD)	20.34 ± (2.11)
Traumatic aortic injury grade	
I Intimal tear	11 (37)
II Intramural hematoma	10 (34)
III Pseudoaneurysm	6 (20)
IV Rupture	2 (6)
Injury severity score (SD)	34 ± (12)
Zones	
1	1 (3)
2	16 (55)
3	12 (41)
Hemodynamic and neurological stability	
Systolic blood pressure < 90 mmHg	6 (20)
GCS < 8	1 (3)
Hemoglobin < 10	6 (20)
Neurological deficit	2 (6)

Table II. Procedure details

Parameters	N (%)
Emergency	23 (79)
Time to hospital (hours)	2.02 ± 1.60
ER to OR (hours)	5.08 ± 9.29
General Anesthesia	27 (93)
Right access perclosure proglide®	24 (82)
Aortic stent graft	
Company	
Cook	18 (62)
Medtronic	11 (37)
Mean diameter in mm	30±6
Mean length in mm	122±29
LSA revascularization	
Zone 1 hybrid debranching	1 (3)
Zone 2 hybrid debranching	5 (17)
Chimney	8 (27)
Partial coverage	2 (6)
Complete coverage	1 (3)
Zone 3 partial coverage	8 (27)
Immediate endoleak	3 (10)
Additional endovascular procedures	5 (17)
Technical success	29 (100%)
Procedure time in minutes (SD)	95.89 ± (78.29)

Table III. Clinical and radiological outcomes

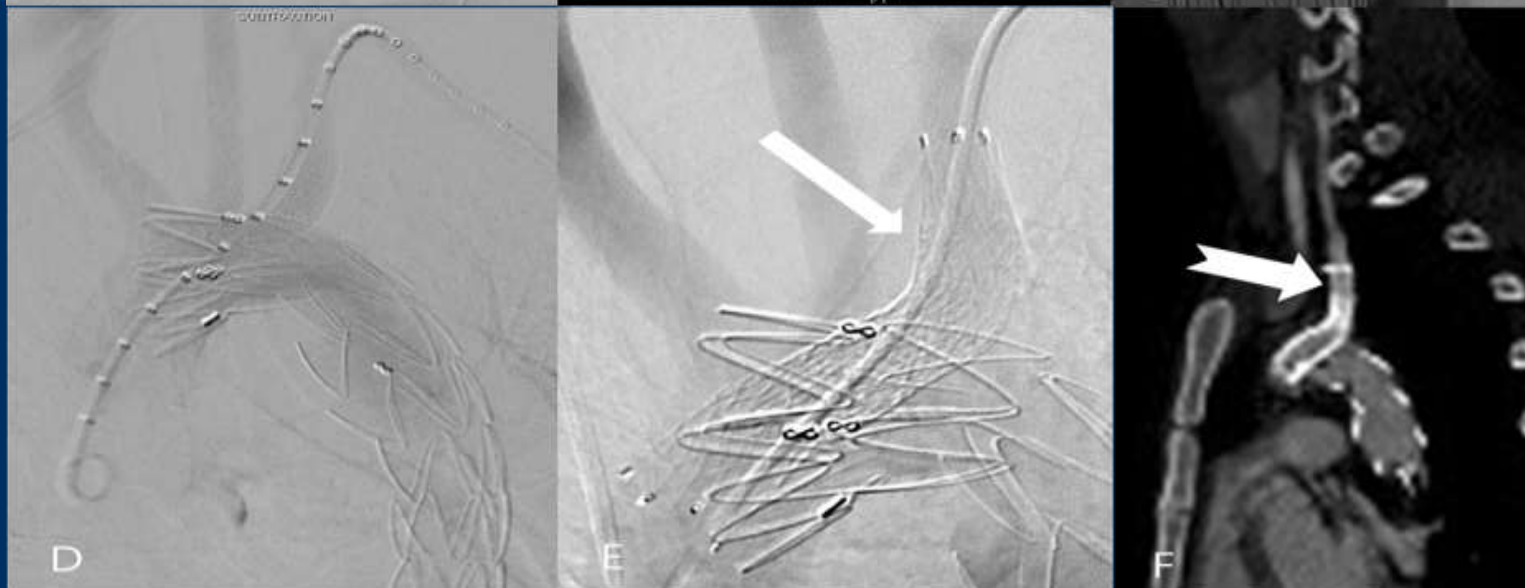
Variables	N (%)
Total ICU stay (h) (SD)	287 ± (375)
Total MVT (h) (SD)	209 ± (342)
Total hospital stay (day) (SD)	36 ± (30)
In hospital mortality	3 (10)
Acute surgical conversion	0
Complication:	
Access site	1 (3)
Stroke	1 (3%)
SCI	0
ARF	4 (13)
Dialysis	3 (10)
TND	3 (10)
PND	0
Pulmonary	2 (6)
Bleeding	0
Infection	3 (10)
Others	2 (6)
Endoleak	3 (10)
Patency of bypass grafts	6 (100%)
Patency of chimney	8 (88)
Re-intervention	4 (13)

Re-intervention

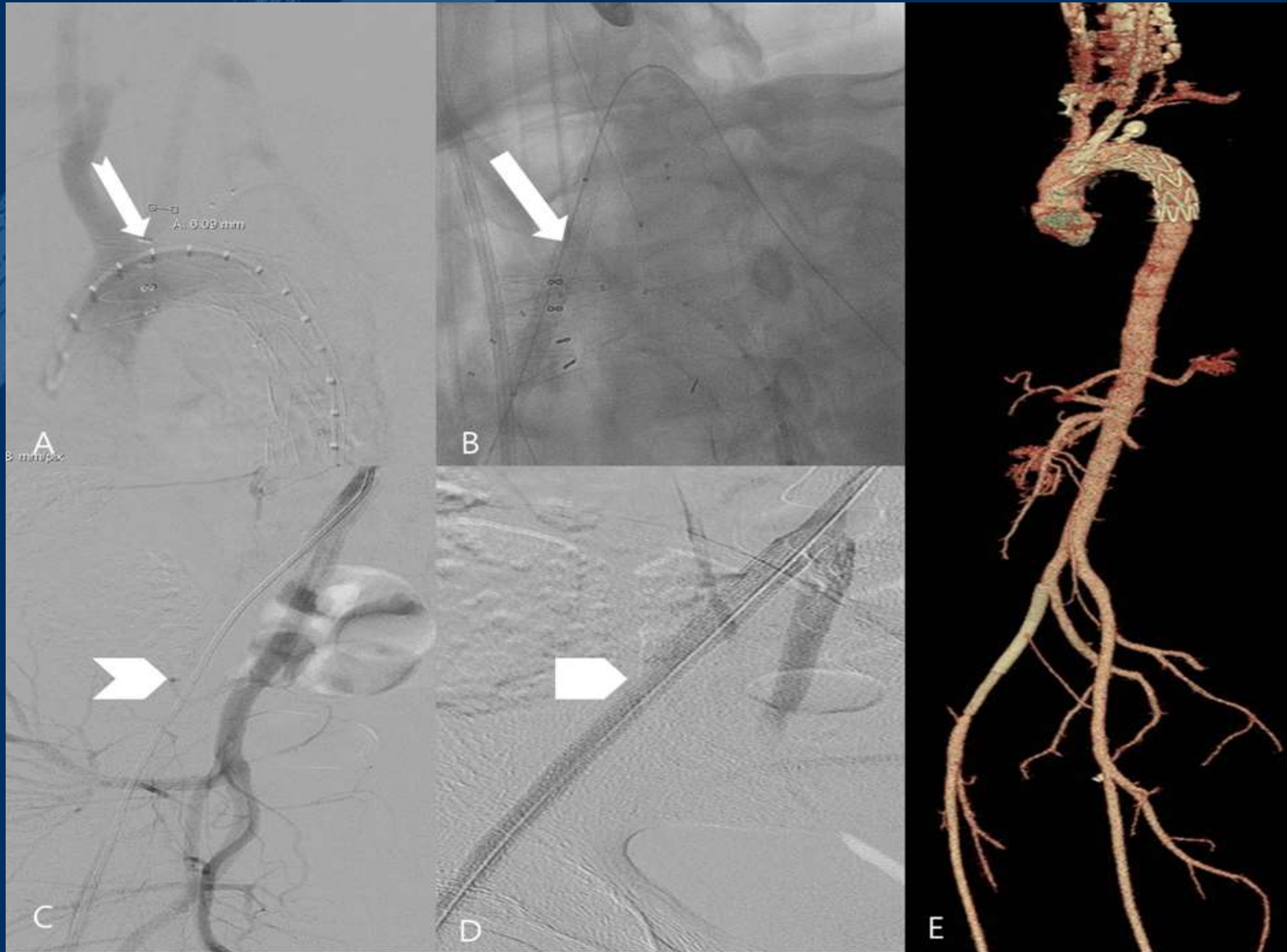
Case 1



Case 2



Complicated Case



Discussion

- TEVAR vs. Open repair.
- Time of intervention.
- Type of anesthesia.
- CSF drainage.
- Heparinization.
- Endograft (size, oversizing, Type).
- Revascularization of LSA.
- Outcome.

TEVAR Vs Open repair

Time of intervention

- Thoracic endovascular aortic repair (TEVAR) became the primary option for traumatic aortic injury (TAI)
- ✓ TEVAR is the main line of treatment for all cases
- ✓ Our study included 79% emergency interference.
- ✓ once stabilization of general condition at the emergency room.
- ✓ mean time between ER and procedure about 5 hours.
- ✓ while others treated after management of their associated injuries but before discharge.

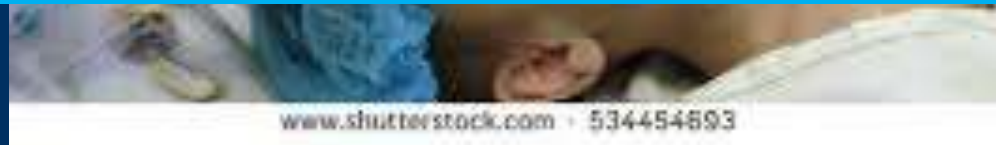
Type of anesthesia

CSF drainage

Heparinization



- ✓ Heparinization is not mandatory especially with short procedures like zone 3 TEVAR and chimney zone 2 TEVAR.
- ✓ Only 3% access site thrombosis and no bleeding complication.



No CSF drainage in such group of patients

Endograft (Size, Oversize, Type)

- Young age increase the difficulties of endograft suitability .
- Off label devices reported problems (bad apposition and sealing)----->endoleak , migration or collapse of endograft.
- We were oversizing the endograft about 10-15% to avoid over dilatation and collapse of distal end.
- We preferred ZENITH TX2 WITH PRO-FORM for zone 1 and 2

Revascularization of LSA

- To date, no clear consensus regarding preoperative LSA revascularization has been reached and published data are controversial.
- Most of lesions on lesser curvature that make revascularization via chimney is satisfactory.
- Hybrid bypasses only for zone 1 and greater curvature tears.

Table IV. Summary of single center studies with range of study period and number of cases comparable With our study (at least 15 cases and 3 years period)

Author	Year (period)	Cases, no.	Mortality (%)	Reintervention (%)	DRC
Orend et al. [19]	1999-2006	34	8.8	11.7	Thrombosis (1), Fracture (1)
Canaud et al. [4]	2001-2007	27	14.8	4	Collapse (1)
Neschis et al. [20]	2004-2008	43	11.6	6.9	Endoleak (4), Collapse (2)
Fernandez et al. [21]	1999-2008	20	0	10	Fracture (1), Collapse (1), Thrombosis (1)
Patel et al. [22]	2002-2010	19	4.6	5.2	Collapse (1)
Riesenman et al. [23]	1990-2010	26	0	19	Bird beak (2)
Lioupis et al. [24]	2002-2011	24	NS	4.1	Pseudocoarctation (1)
Marone et al. [25]	2003-2010	28	NS	4.2	Thrombosis (1)
Present study	2012-2016	29	10	13	Endoleak 3

Home Message

- ❖ TEVAR for TAI is a feasible and effective mechanism with low associated mortality and morbidity.
- ❖ The high re-intervention rate can be decreased by decision individualization for each patient with:

- ✓ good assessing of general stability.
- ✓ time of interference.
- ✓ suitable device.
- ✓ method of best revascularization to LSA when possible.
- ✓ adjusting anticoagulant.