Title

Contemporary Outcomes of Thoracic Endovascular Aortic Repair in Patients With Connective Tissue Disorders: A Multi-Centre National Study

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Conclusions: Previously described reduction in AAA growth rates appears to be driven by RT, rather than malignancy itself. This provides important insight into the mechanism of growth and future areas of investigation for novel AAA prevention/treatment strategies.

Table I. Distribution of cancer type and association with aneurysm growth rates

	Patients,[a] n (%)	Growth estimate[b] (95% CI)
Head/neck	225 (6.0)	1.4% (−0.6, 3.4)
Melanoma	196 (5.2)	−1.1% (−3.1 to 0.8)
Thoracic	628 (16.8)	1.2% (0.01 to 2.4)
Genitourinary	1617 (43.2)	0.3% (−0.9 to 1.5)
Gynecologic	73 (2.0)	2.4% (−0.9 to 5.7)
Upper gastrointestinal	267 (7.1)	2.1% (0.6 to 3.5)
Lower gastrointestinal	470 (12.6)	−0.04% (−1.5 to 1.4)
Breast	197 (5.3)	1.8% (−0.6 to 4.1)
Leukemia/lymphoma	357 (9.5)	1.4% (−0.3 to 3.0)
Other	288 (7.7)	1.3% (−0.4 to 3.0)

CI, Confidence interval.
[a]Total N = 3743 patients, some patients with more than one type of cancer.
[b]Percent change in growth rate per 10 years.

Table II. Distribution of cancer treatment/stage and association with aneurysm growth rates

	Patients,[a] n (%)	Growth estimate[b] (95% CI)
Cancer treatment		
Chemotherapy	1144 (30.6)	0.3% (−0.5 to 1.2)
Hormone treatments	541 (14.5)	−0.7% (−1.9 to 0.6)
Immunotherapies (BRM)	130 (3.5)	0.8% (−0.8 to 2.5)
Radiation	588 (15.7)	−1.5% (−2.4 to −0.6)
Cancer stage		
Not applicable/not staged	324 (8.7)	−0.1% (−2.2 to 2.0)
Localized	3055 (81.6)	−1.0% (−2.1 to 0.01)
Regional	997 (26.6)	−1.5% (−2.9 to −0.2)
Distant	1145 (30.6)	−1.1% (−2.5 to 0.3)

BRM, Biological response modifier; *CI*, confidence interval.
[a]Total N = 3743 patients; some patients with more than one type of treatmen.t/stage.
[b]Percent change in growth rate per 10 years.

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Contemporary Outcomes of Thoracic Endovascular Aortic Repair in Patients With Connective Tissue Disorders: A Multi-Centre National Study

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Objective: Thoracic endovascular aneurysm repair (TEVAR) has become the standard treatment for thoracic aortic aneurysms and dissection. Patients with Ehlers-Danlos type IV and Marfan syndrome presenting with thoracic aortic aneurysms (TAAs) and dissection are significantly challenging for the treating surgeons due to the complexity of their underlying pathology.

Methods: We queried the Vascular Quality Initiative-Medicare linked data, stratifying patients undergoing TEVAR by history of connective tissue disease (CTD). Multivariable logistic regression was used to determine postoperative outcomes. Kaplan-Meier curves were plotted to analyze long-term survival trends, with the log-rank test used to compare outcomes between groups within the specified time periods. Cox proportional models were used to determine adjusted long-term outcomes.

Results: Patients with CTD (N = 188), compared with those without (n = 7688), were younger (70.7 ± 10.9 vs 74.2 ± 10.9 years; $P < .01$), but had similar distributions across all other characteristics and comorbidities, such as sex (male 56.9% vs 61.3%; $P = .22$) and hypertension (91.4% vs 90%; $P = .65$). After adjusting for potential confounders, patients with CTD compared with those without had similar odds of 30-day mortality, stroke, spinal cord ischemia, myocardial infarction, heart failure, and respiratory complications (Fig 1). Three-year survival was not significantly different between both groups (73.7% vs 63.1%; log-rank = .11) (Fig 2). There were no differences in mortality and reintervention within the first year between both groups. Three-year survival was not significantly different between both groups (73.7% vs 63.1%; log-rank = .11). In the adjusted Cox model, no differences in 3-year outcomes were found: mortality (adjusted hazard ratio [aHR], 0.76; 95% confidence interval [CI], 0.51-1.12; $P = .16$); 3-year reintervention (aHR, 1.09; 95% CI, 0.78-1.53; $P = .61$), and 3-year rupture (aHR, 1.09; 95% CI, 0.45-2.65; $P = .85$).

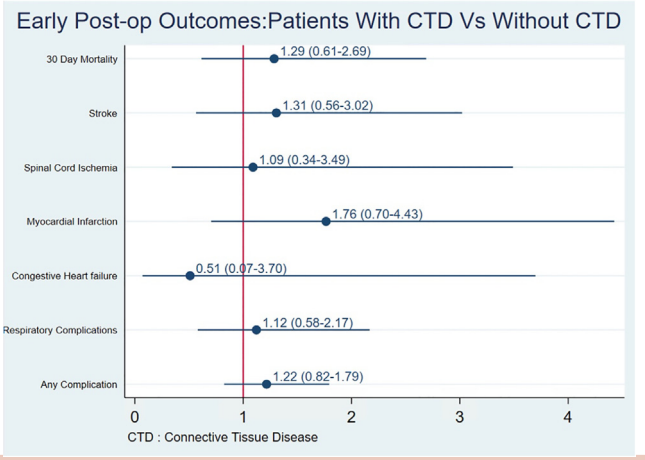

Fig 1. Postoperative thoracic endovascular aneurysm repair (TEVAR) outcomes comparing patients with connective tissue disease (CTD) with those without.

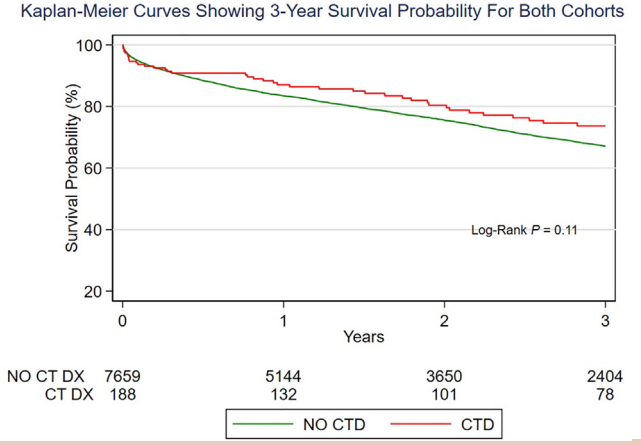

Fig 2. Kaplan-Meier curves showing 3-year survival probability after thoracic endovascular aneurysm repair (TEVAR) comparing patients with connective tissue disease (CTD) vs those without.

Conclusions: Despite their complex anatomical challenges, patients with connective tissue disease undergoing TEVAR have similar postoperative and long-term outcomes compared with patients without. Further studies are needed to confirm our findings to support the use of TEVAR in patients with CTD.

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Traumatic Aortic Disruption Index (TADI) Predicts Mortality and Urgency of Stent Grafting in Blunt Thoracic Aortic Pseudoaneurysms

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Objective: Delayed stent grafting of blunt thoracic aortic (grade 3) pseudoaneurysms (BTAPs) is a standard practice, allowing focus on more acute life-threatening injuries. Which severe BTAPs require urgent intervention is currently unclear. We hypothesize that a Traumatic Aortic Disruption Index (TADI) based on sagittal computed tomography (CT) imaging would predict urgency of stent grafting in polytrauma patients.

Methods: All BTAPs at a level-1 trauma center over 12-years were identified. TADI score was calculated utilizing pseudoaneurysm length (L), maximum injury width (W), and normal adjacent aortic diameter (NA) on a CT image (Fig 1). Patient presentation, timing of stent grafting, and outcomes were then evaluated.

Results: Forty-two patients were diagnosed with BTAP. Mean age was 37.6 years, with median injury severity score (ISS) of 29. Overall mortality was 11.9% (aorta-related, n = 3; 60%; traumatic brain injury [TBI], n = 2; 40%). TADI scores ranged from 3.6 to 158.6. Compared with patients with TADI <28 (n = 21), patients with TADI >28 (n = 21) had similar median ISS scores (34 vs 29; $P = .16$) and rates of both TBI (33.3% vs 42.0%; $P = .53$) and non-TEVAR hemorrhage control procedures (44.4% vs 33.3%; $P = .3$). However, patients with TADI >28 had lower presentation mean systolic blood pressure (98.5 mmHg vs 121.9 mmHg; $P = .003$) and higher overall mortality (23.8% vs 0%; $P = .048$). Patients with TADI >28 received stent grafting at significantly shorter time intervals (median 4 vs 14 hours; $P = .001$). In subgroup analysis of patients with TBI (n = 16), overall median time from injury to stent grafting was 5 hours. Patients with TADI>28 and TBI received stent grafting at significantly shorter time intervals than patient with TADI <28 and TBI (median 3 vs 10 hours; $P = .026$).

Conclusions: This simple-to-calculate score predicted mortality and urgency of stent grafting in polytrauma patients with similar ISS and rates of TBI. TADI should be validated in a larger prospective study as an injury prioritization tool in trauma patients with BTAPs.

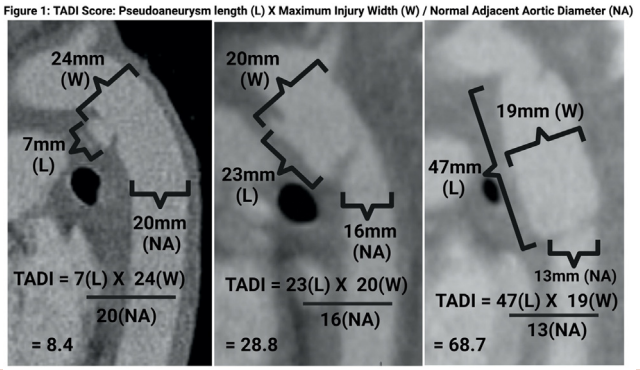

Fig. Traumatic Aortic Disruption Index (TADI) score: pseudoaneurysm length (L) × maximum injury width (W) / normal adjacent aortic diameter (NA).

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Right Atrial Inflow Balloon Occlusion for Zone Zero Thoracic Endovascular Repair: Safety, Efficacy and Predictors of Response

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Objective: Right atrial inflow occlusion with an inferior vena cava (IVC) balloon offers an alternative to traditional rapid ventricular pacing for cardiac output control during deployment of thoracic endografts. Landing in zone 0 demands more precise and significant reductions of aortic impulse. We aim to evaluate the safety and efficacy of IVC balloon occlusion, and determine the predictors of the blood pressure response in patients who underwent branched aortic arch endovascular repair.

Methods: Consecutive patients who underwent endovascular repair of arch aneurysms using custom-made inner side branch aortic endografts landing in zone 0 were studied. IVC balloon occlusion was used routinely for blood pressure reduction with a systolic target of 70 mmHg. The intraoperative arterial blood pressure response was matched to procedural fluoroscopy. Primary outcomes were the safety and efficacy of IVC balloon occlusion. Secondary outcomes include the predictors of the blood pressure response during induction, deployment, and recovery phases of hypotension.

Results: A total of 23 patients were included (91.3% male; mean age, 75.7 years). The mean duration of IVC balloon occlusion was 65 seconds (range, 35-109 seconds), Graft deployment took a mean time of

Table. Intraoperative blood pressure response with inferior vena cava (IVC) balloon occlusion during Zone 0 thoracic endovascular aneurysm repair (TEVAR)

	Mean	Range	SD
Balloon inflation time, seconds	65.0	35-109	17.40
Graft deployment time, seconds	16.2	5-30	8.42
Duration of hypotension, seconds	98.1	65-154	20.85
SBP before balloon occlusion, mmHg	97.5	70-128	15.50
Lowest SBP attained during balloon occlusion, mmHg	55.4	20-60	12.12
Time to target SBP, seconds	41.4	20-60	12.12
Time for recovery to baseline SBP, seconds	33.1	25-45	5.83

SBP, Systolic blood pressure.

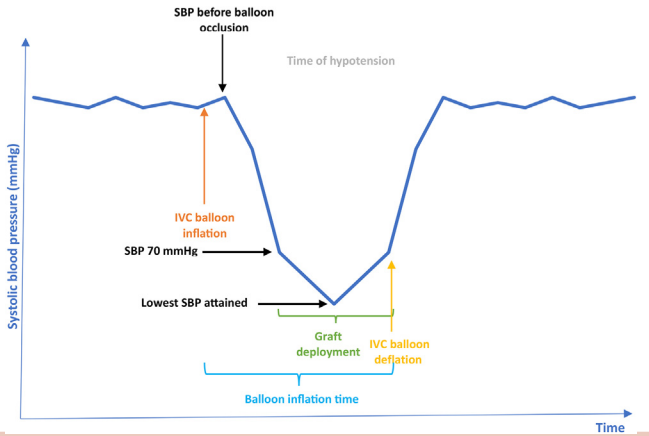

Fig. Systolic blood pressure (SBP) response upon inferior vena cava (IVC) balloon occlusion and release.