

The Impact Of Low BMI On Perioperative And Long-term Outcomes After TEVAR

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Objective

- While several studies have evaluated the impact of elevated body mass index (BMI) on outcomes after endovascular abdominal aortic aneurysm repair (EVAR), the relationship between underweight and long-term outcomes after thoracic endovascular aortic aneurysm repair (TEVAR) remains poorly understood.
- We investigated the role of low BMI on clinical and technical outcomes in patients who underwent TEVAR.

Methods

- The Global Registry for Endovascular Aortic Treatment (GREAT) Registry is an ongoing multicenter, multi-national, observational cohort study between August 2010-September 2016.
- All patients treated with Conformable GORE® TAG® Thoracic Endoprosthesis devices were included. Patients were considered underweight with BMI <23 kg/m² according to National Institute of Health guidelines for patients ≥65 years.
- Normal BMI was defined by BMI ≥23-25 kg/m². Long-term patient follow-up was assessed annually, up to 7 years post-intervention. Primary outcomes were technical surgical complications, including rates of endoleak, rupture, and migration.
- Secondary outcomes included postoperative complications.

Results

- Out of 884 patients undergoing TEVAR, 161 (18%) were defined as underweight. 129(15%) were considered normal-weight, and 594 (67%) had BMI>25.
- One year postoperatively, there was no statistically significant difference in rates of endoleak (5.0% vs 6.2%, p=0.3) (Table 1).
- Underweight patients developed significantly higher rates of aortic rupture than normal weight patients at 1 year (3.1% vs 1.6%, p=0.02).

Results

- After 2-3 years postoperatively, underweight patients had significantly higher rates of Type 1B endoleak when compared to normal weight patients (5.2% vs 1.3%, p=0.01).
- No difference in endoleak, migration, or rupture rates existed between underweight groups after 4-7 yrs postoperatively.
- No significant difference in reintervention rates was identified throughout all follow-up intervals. Interestingly, the rate of all-cause mortality was significantly higher in the normal weight patients than underweight patients at the 1-year (17.4% vs 15.5%, p=0.03) and 2-3 year (11.1% vs 20.0%, p=.0006) intervals postoperatively. No significant difference in mortality was determined between the groups after 4-7 years postoperatively (Table 1).

Conclusions

- Patients with low BMI undergoing TEVAR experience higher rates of aortic rupture and Type 1B endoleak, with no significant difference in postoperative reintervention rates.
- These findings should be considered in risk reduction and preoperative optimization of patients considered for TEVAR.

References

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Characteristic	Underweight BMI<23 N=161	Normal Weight BMI 23-25 N=129	Overweight BMI 25-30 N=369	Obese BMI 30-35 N=155	Morbid Obesity BMI>35 N=70	p-value
Baseline Characteristics						
Gender						
Male	95 (59.0%)	74 (57.4%)	272 (73.7%)	106 (68.4%)	41 (58.6%)	
Female	66 (41.0%)	55 (42.6%)	97 (26.3%)	49 (31.6%)	29 (41.4%)	
Age (Years)						
n	161	129	369	155	70	
Mean (Std Dev)	65.6 (16.8)	67.3 (12.9)	65.4 (13.5)	62.8 (14.5)	59.3 (12.3)	
Weight (kg)						
n	161	129	369	155	70	
Mean (Std Dev)	60.7 (10.4)	69.2 (9.0)	81.5 (10.0)	93.7 (12.5)	118.6 (18.7)	
Postoperative Details						
1 year						
Any Endoleak	8 (5.0%)	8 (6.2%)	31 (8.4%)	7 (4.5%)	2 (2.9%)	0.3
Type IA Endoleak	4 (2.5%)	3 (2.3%)	6 (1.6%)	2 (1.3%)	0 (0.0%)	0.8
Type IB Endoleak	1 (0.6%)	4 (3.1%)	13 (3.5%)	1 (0.6%)	0 (0.0%)	0.076
Type II Endoleak	2 (1.2%)	2 (1.6%)	8 (2.2%)	3 (1.9%)	2 (2.9%)	>0.9
Type III Endoleak	0 (0.0%)	1 (0.8%)	3 (0.8%)	0 (0.0%)	0 (0.0%)	0.7
Type IV Endoleak	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Migration	0 (0.0%)	0 (0.0%)	2 (0.5%)	0 (0.0%)	0 (0.0%)	>0.9
Fracture	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Aortic Rupture	5 (3.1%)	2 (1.6%)	1 (0.3%)	0 (0.0%)	1 (1.4%)	0.017
All reinterventions	21 (13.0%)	20 (15.5%)	66 (17.9%)	21 (13.5%)	8 (11.4%)	0.4
All cause mortality	28 (17.4%)	20 (15.5%)	44 (11.9%)	10 (6.5%)	6 (8.6%)	0.026
2-3 years						
Number of Subjects With Imaging and/or Event	N = 132	N = 108	N = 312	N = 140	N = 63	
Any Endoleak	7 (7.8%)	2 (2.5%)	7 (3.5%)	4 (4.2%)	3 (7.0%)	0.4
Type IA Endoleak	1 (1.3%)	1 (1.3%)	1 (0.3%)	3 (3.2%)	1 (2.3%)	0.3
Type IB Endoleak	4 (5.2%)	1 (1.3%)	0 (0.0%)	1 (1.1%)	0 (0.0%)	0.012
Type II Endoleak	0 (0.0%)	0 (0.0%)	4 (2.0%)	0 (0.0%)	0 (0.0%)	0.5
Type III Endoleak	1 (1.3%)	0 (0.0%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	
Type IV Endoleak	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Migration	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Fracture	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Aortic Rupture	0 (0.0%)	1 (1.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0.5
All reinterventions	8 (6.3%)	5 (4.8%)	13 (4.5%)	6 (4.7%)	4 (6.9%)	0.8
All cause mortality	14 (11.1%)	21 (20.0%)	35 (12.0%)	7 (5.5%)	3 (5.2%)	0.006
4-7 years						
Number of Subjects With Imaging and/or Event	N = 109	N = 82	N = 265	N = 127	N = 56	
Any Endoleak	2 (4.0%)	2 (4.0%)	7 (5.1%)	4 (5.7%)	2 (6.1%)	>0.9
Type IA Endoleak	0 (0.0%)	1 (2.0%)	3 (2.2%)	0 (0.0%)	0 (0.0%)	0.7
Type IB Endoleak	2 (4.0%)	1 (2.0%)	0 (0.0%)	1 (1.4%)	1 (3.0%)	0.089
Type II Endoleak	0 (0.0%)	0 (0.0%)	1 (0.7%)	2 (2.9%)	1 (3.0%)	0.3
Type III Endoleak	0 (0.0%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	>0.9
Type IV Endoleak	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Migration	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Fracture	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Aortic Rupture	1 (1.1%)	1 (1.4%)	3 (1.3%)	1 (0.9%)	0 (0.0%)	>0.9
All reinterventions	4 (4.3%)	3 (4.1%)	10 (4.4%)	6 (5.7%)	3 (6.4%)	0.9
All cause mortality	24 (26.1%)	16 (21.9%)	38 (16.9%)	23 (21.7%)	14 (29.8%)	0.2

Table 1. Technical and Postoperative Complications

