

Impact Of Hospital Teaching Status on Outcomes in Type B Aortic Dissection: Analysis of 40,000 Patients

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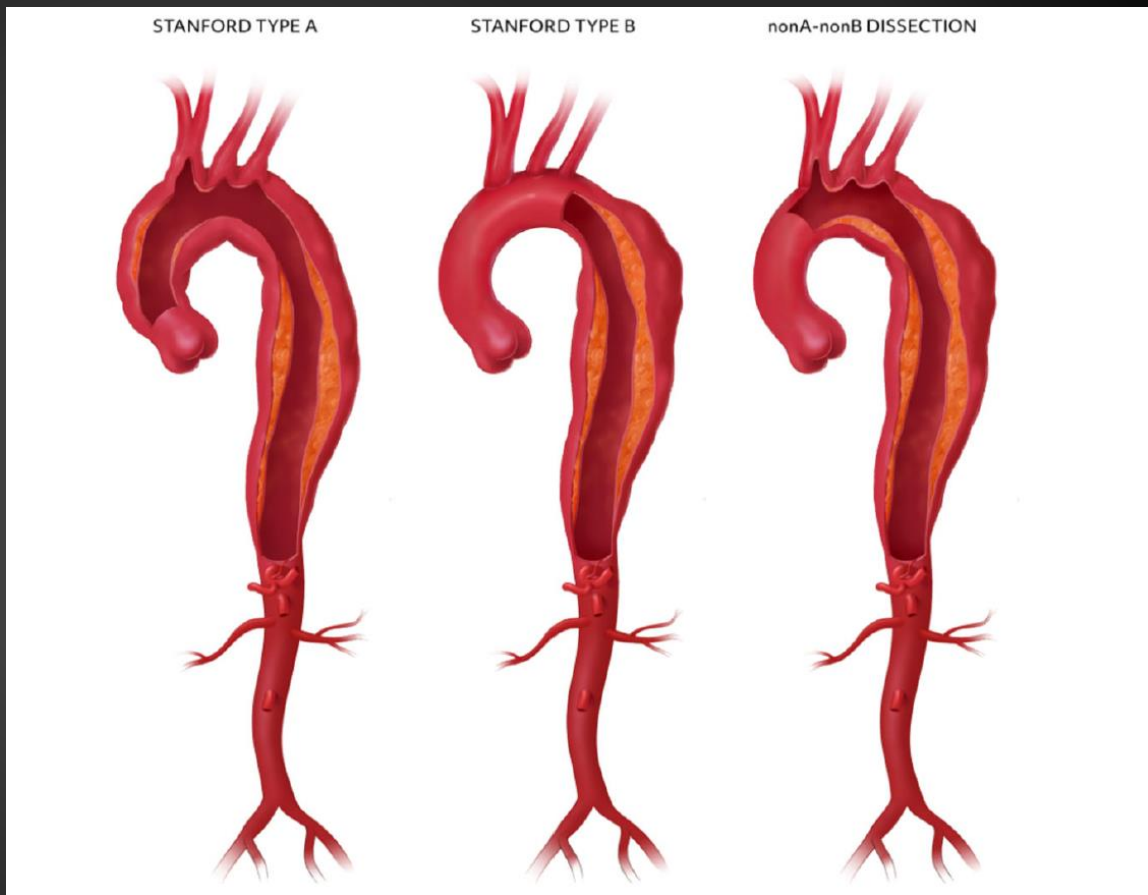
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Acute Aortic Dissection

- 2-4 per 100,000 person-years
- 59-67% are Type A, 31% are Type B, 3-10% are non-A-non-B
- Men > Women



Background & Aims

- Aortic dissections are life-threatening emergencies
- Types
 - Stanford type A (TAAD)
 - Stanford type B (TBAD)
 - Non-A non-B
- **Type B**
 - Better early survival (65% survival at 1 year)
 - Poor late outcomes (50% survival at 5 years)
- Teaching hospitals often tertiary or quaternary care centers
- Aim: analyze effect of hospital teaching status on TBAD outcomes



Methods

- The National Readmissions Database (NRD) was used to identify all TBAD between 2016 and 2020
- Patients stratified by hospital teaching status
- Mixed effects and logistic regression models were created for 30-day readmission and in-hospital mortality
- Subgroup analysis of open surgical repair (OSR) versus thoracic endovascular aortic repair (TEVAR) was undertaken



Results

- A total 44,981 patients included
 - 12% (5,421) treated at non-teaching (NT) hospitals
 - 88% (39,470) treated at teaching (T) hospitals

- Patients treated at teaching hospitals:
 - Younger (65 years (54-76) vs. 69 years (58-80), $p < 0.001$)
 - Comprised less women (39.7% (15,653) vs. 43.8% (2376), $p < 0.001$)
 - Longer duration of stay (6 days (3-12) vs. 5 days (2-9), $p < 0.01$).
 - Incurred higher charges (\$32,300 (12.3-70.2) vs. \$16,900 (8.4-44.1), $p < 0.001$).



Results

Comparison of TBAD treatment outcomes between non-teaching (NT) and teaching (T) hospitals

Outcome	NT	T	P-Value
In-hospital death	694 (12.8%)	4391 (11.1%)	<.001
Stroke	73 (1.3%)	714 (1.8%)	0.015
Length of stay (days)	5.0 (2.0- 9.0)	6.0 (3.0-12.0)	<.001
Disposition at discharge			<.001
Routine	2284 (42.1%)	17319 (43.9%)	
Transfer to short-term hospital	283 (5.2%)	935 (2.4%)	.
Transfer other: includes Skilled Nursing Facility (SNF), Intermediate Care Facility (ICF), and another type of facility	970 (17.9%)	7161 (18.1%)	.
Home Health Care (HHC)	1101 (20.3%)	9065 (23.0%)	.
Against medical advice (AMA)	88 (1.6%)	560 (1.4%)	.
Died in hospital	694 (12.8%)	4391 (11.1%)	.
Discharged alive, destination unknown	1 (0.0%)	39 (0.1%)	.
Myocardial infarction	257 (4.7%)	1688 (4.3%)	0.1155
Heart failure	823 (15.2%)	5530 (14.0%)	0.0204
Arrhythmia	1400 (25.8%)	10276 (26.0%)	0.7417
Pneumonia	640 (11.8%)	3821 (9.7%)	<.001
Acute kidney injury	1503 (27.7%)	13429 (34.0%)	<.001
Urinary tract infection	552 (10.2%)	3501 (8.9%)	0.0016
Paraplegia	81 (1.5%)	582 (1.5%)	0.9104
Bowel ischemia	102 (1.9%)	1146 (2.9%)	<.001
Ileus	113 (2.1%)	1434 (3.6%)	<.001
Wound complication	33 (0.6%)	427 (1.1%)	0.0012
Sepsis	362 (6.7%)	2160 (5.5%)	<.001
Hemorrhage	849 (15.7%)	10107 (25.6%)	<.001
Permanent pacemaker implantation	43 (0.8%)	270 (0.7%)	0.3651

Readmission

Readmission parameter	NT	T	P-Value
30-day readmission	996 (23.2%)	6977 (22.0%)	0.0723
Elective readmission	70 (1.6%)	817 (2.6%)	<.001
Adjusted cost on 30-day readmission *\$1000)	12.2 (7.0-28.1)	15.6 (7.8-38.0)	<.001
Time to 30-day readmission	13.0 (6.0-21.0)	13.0 (6.0-20.0)	0.7024



Effect	OR	95% Confidence Limits		p-Value
Age	0.968	0.965	0.971	<.0001
Length of stay	1.173	1.164	1.182	<.0001
Teaching hospital	0.958	0.87	1.168	0.378
Resident	0.909	0.876	1.116	0.857
Non elective status (ref=elective status)	0.483	0.425	0.55	<.0001
Payment (ref=Medicare)				
Medicaid	1.957	1.753	2.184	<.0001
Private insurance	1.586	1.459	1.725	<.0001
Self-pay	0.971	0.839	1.123	0.689
No charge	1.556	0.889	2.726	0.122
Other	1.112	0.93	1.33	0.245
Missing	1.639	0.765	3.513	0.204
Female	0.862	0.809	0.918	<.0001
Median household income for patient's zip code				
26th to 50th percentile (median)	0.904	0.83	0.984	0.02
51st to 75th percentile	0.937	0.859	1.021	0.139
76th to 100th percentile	0.855	0.78	0.936	0.001
Diabetes Mellitus	1.226	1.141	1.318	<.0001
Dyslipidemia	1.352	1.264	1.446	<.0001
Coagulation Disorder	0.678	0.63	0.73	<.0001
Heart Valve Disorder	1.224	1.134	1.322	<.0001
Other Cardiac Condition	0.39	0.362	0.419	<.0001
Hypertension	2.242	2.068	2.431	<.0001
Coronary Artery Disease	1.003	0.935	1.076	0.931
Congestive Heart Failure	0.939	0.873	1.009	0.088
Cerebral Vascular Disease	0.474	0.44	0.51	<.0001
Peripheral Vascular Disease	0.74	0.685	0.799	<.0001
COPD	1.099	1.016	1.189	0.018
Chronic Kidney Disease	0.991	0.922	1.066	0.815
Hospital Bedsize (ref=Large)				
Small	0.94	0.836	1.058	0.306
Medium	0.946	0.875	1.022	0.157
Hospital control (ref=Government, nonfederal)				
Private, not-profit	1.058	0.964	1.162	0.237
Private, invest-own	0.88	0.769	1.008	0.065
Small metropolitan areas with less than 1 million residents	0.759	0.71	0.81	<.0001

Results

Logistic regression analysis for in hospital death in the overall cohort

Subgroup analysis by treatment modality: TEVAR vs Open Surgical Repair

- TEVAR (4096 patients)
 - T: 3809
 - NT: 287
 - In-hospital mortality (T: 5.5% vs. NT: 3.8%, $p=0.2236$)
comparable

- OSR (2456 patients)
 - T: 2276
 - NT: 180
 - In-hospital mortality better at teaching hospital (T: 12.1% vs. NT: 17.8%, $p=0.0265$)



Discussion

- Most TBADs are managed at teaching hospitals
- Some survival advantage seen at teaching hospitals
- Other outcomes are generally comparable
- TEVAR management is comparable between types of hospitals
- **Open surgical repair of TBAD may benefit from treatment at teaching hospitals.**



Conclusion

- Type B aortic dissections continue to be primarily managed by teaching hospitals, with superior in-hospital survival at teaching hospitals.
- **Surgical management** seems to yield **better in-hospital survival at teaching hospitals** while no such benefit is seen in TEVAR for TBAD at either type of institution.

