Open Repair of Residual Type B Aortic Dissection Following Revised Type A Aortic Dissection Repair

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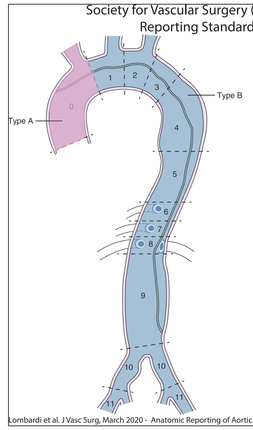
Introduction

- Aortic dissections are an acute aortic syndrome which involve disruption of the tunica intima of the aorta, leading to a dissection plane with blood penetrating into the tunica media[1].
- Aortic dissections have a high mortality rate, with 18- 49% of patients dying before the condition is recognized[1].
- The Society for Vascular Surgery (SVS) and Society for Thoracic Surgery have classified zones of aorta (0-9) to recognize entry and exit points of the dissecting segment of aorta[2].
- Surgical repair modalities include endovascular or open surgical reconstruction[1].

Society for Vascular Surgery (SVS) and Society of Thoracic Surgeons Reporting Standards for Type B Aortic Dissection



Type	Proximal Extent	Distal Extent
A_D Entry tear: Zone 0	0	0
	1	1
	2	2
	3	3
	4	4
B_{PD} Entry tear: ≥Zone 1	5	5
	6	6
	7	7
	8	8
	9	9
I_D Unidentified entry tear involving Zone 0	10	10
	11	11
	12	12

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Case Presentation

HPI: 51-y/o with Type A aortic dissection who underwent an open repair at an OSH complicated by mediastinal collection, aortic insufficiency and tamponade physiology. Patient required a redo sternotomy, aortic valve replacement and aorto-right axillary bypass. Post-operatively, the patient had residual Type B aortic dissection (TBAD) that was noted on post-operative monitoring to be increasing in size.

PMH	• Hypertension, Hyperlipidemia, Alcohol Use Disorder
PSH	• Open repair of Type A Aortic dissection with supra-coronary graft using moderate hypothermic circulatory arrest. • Redo sternotomy with AVR with pericardial tissue valve and aortic-right axillary bypass graft with cardiopulmonary bypass utilization
SH	• Smoking (5 pack-years)
PE	• Pulsatile abdominal mass and abdominal bruit

Operative Case

Imaging:

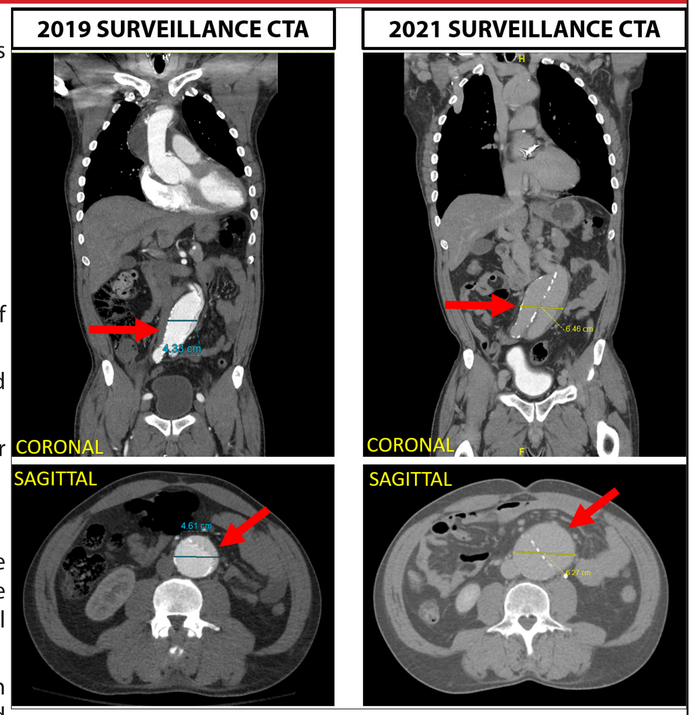
- Computed tomography angiography (CTA) was performed annually for TBAD surveillance
- Surveillance CTA shows an increase TBAD size:
  - 2019: 4.33cm x 4.61cm
  - 2020: 5.4cm
  - 2021: 6.46cm x 6.27cm

Operative Indications:

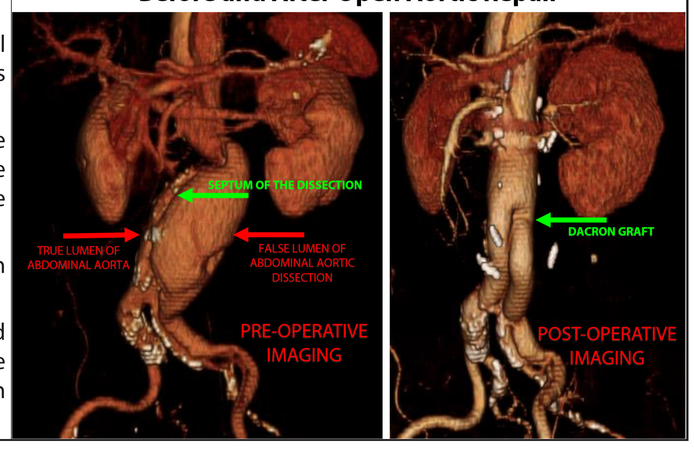
- Growth rate: aortic growth rate exceeded threshold of >1cm/year[1].
- Size: descending aortic diameter exceeded threshold of 5.5-6.0cm[1].
- Unique anatomy and no distal landing zone for endograft placement favored open repair.

Operative Procedure:

1. An oblique incision was made extending from the posterior axillary line to the lateral border of the rectus muscle this allowed for a retroperitoneal approach to the infrarenal aorta.
2. Control of the proximal aorta was obtained with a supra celiac clamp. The IMA was ligated and transected. The celiac, SMA, and left renal artery were dissected free from surrounding tissue and controlled with vessel loops.
3. Distal control was obtained with the bilateral common iliac arteries dissected free and cross clamped.
4. The aorta was then opened at the level of the aneurysm neck, just at the renal arteries. A safe sewing ring for the graft was identified and a wedge of the septum of the dissection was removed.
5. Proximal clamp was moved to suprarenal position to allow perfusion of visceral vessels.
6. A 24mm x 12mm Rifampin-soaked bifurcated Dacron graft was sutured proximally to the infrarenal aorta and distally to the bilateral common iliac arteries.



3D Reconstruction of Type B Aortic Dissection Before and After Open Aortic Repair



Post-Op

- Postoperatively, the patient was carefully monitored for strict blood pressure control, neurovascular checks and management of his alcohol withdrawal symptoms.
- Patient was successfully discharged to sub-acute rehab on POD 14.
- Patient was seen 1 month post-operatively and was cleared to return to work, imaging at that time (seen in Figure 3) shows intact Dacron graft placement.

Discussion

- Aortic dissections are a potentially life-threatening condition that requires efficient identification, prompt management and regular post-operative monitoring.
- The management of a residual Type B dissection is an evolving field.
- This patient's aneurysmal degeneration of the abdominal section required intervention to prevent rupture and death.
- The lack of a dissection free landing zone made endovascular repair unfavorable, prompting open repair.
- With ongoing surveillance strategies residual Type B dissections can be successfully managed to prevent late complications.

References

1. Braverman AC, Schermerhorn M. Diseases of the Aorta. In: Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. Vol 2. 12th ed. Elsevier; 2023:806-836.
2. Lombardi JV, Hughes GC, Appoo JJ, et al. Society for Vascular Surgery (SVS) and Society of Thoracic Surgeons (STS) reporting standards for type B aortic dissections. J Vasc Surg. 2020;71(3):723-747. doi:10.1016/j.jvs.2019.11.013