Type B Aortic Dissections
Current Guidelines for Treatment

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KEYWORDS

• Stanford type B aortic dissection • False lumen • Treatment • TEVAR • Remodeling

KEY POINTS

- Stanford type B aortic dissections (TBADs) involve the descending aorta and are further classified by time of onset and presence of complications.
- Diagnosis begins with clinical suspicion and is confirmed with imaging of the entire aorta.
- Anti-impulse medical therapy is the cornerstone of treatment and should be initiated immediately on diagnosis for all aortic dissections.
- Thoracic endovascular aortic repair (TEVAR) is indicated in patients with complicated TBAD as well as during the subacute phase in high-risk patients with uncomplicated TBAD.
- Surveillance imaging with serial CT angiography (CTA) is mandatory to identify potential disease progression and device-related complications.

INTRODUCTION

Pathophysiology

Aortic dissections are a subclass of acute aortic pathology characterized by a tear in the innermost layer of the aortic wall, the intima, allowing some of the blood flow to escape from the main passageway (the true lumen [TL]) of the aorta and reroute into an artificial secondary passageway (the false lumen [FL]) between the intima and media of the aortic wall. This entry tear can be located anywhere along the length of the aorta (**Fig. 1**). Driven by the high pressure within the aorta, the flow of blood through the entry tear leads to separation of the layers of the aortic wall and subsequent propagation of the FL either antegrade or retrograde along the aorta or occasionally in both directions. This constellation of events can disrupt normal blood flow resulting in clinically significant malperfusion to vital organs or weakening of the aortic wall with ensuing aortic rupture.[1,2]

Classification and Prognosis

Aortic dissections are classified based on the anatomic distribution of the dissection, the time from symptom onset, and the presence of complications. Using these classifications, clinicians gain significant prognostic information that aid in developing the most effective treatment plan individualized for each patient.

Anatomic distribution

The aorta is divided into distinct anatomic segments. The ascending aorta and the aortic arch are the first 2 segments, encompassing the portion of the aorta from its root up to and including the left subclavian artery (LSCA), and the descending aorta begins just distal to the LSCA and includes the thoracic and abdominal portions of the aorta. In 1965, DeBakey and colleagues[3] used these anatomic segments to classify aortic dissections into 3 separate types according to anatomic involvement: type I involves both the ascending

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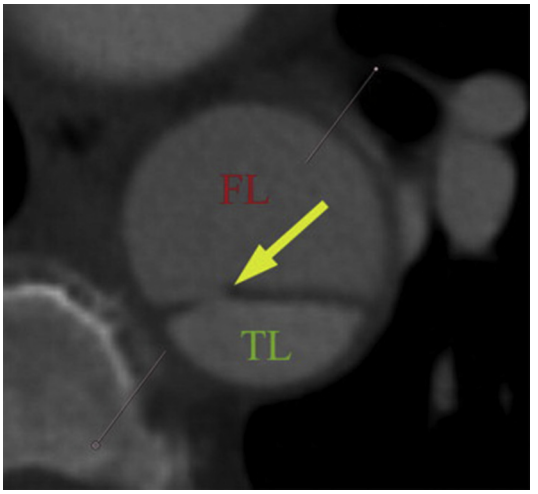

Fig. 1. Aortic dissection with an entry tear (*arrow*) in an intimal flap separating the TL from the FL, as seen on axial view of CTA. (*From* Tolenaar JL, van Keulen JW, Trimarchi S, et al. Number of entry tears is associated with aortic growth in type B dissections. Ann Thorac Surg 2013;96(1):40; with permission.)

and descending aorta, type II is isolated to the ascending aorta and the aortic arch, and type III is isolated to the descending aorta (further subdivided into IIIa and IIIb).

Shortly thereafter, Daily and colleagues[4] at Stanford University discovered that anatomic distribution of dissections directly affects patient outcomes. Mortality was significantly improved when patients with aortic dissections involving the ascending aorta received surgical versus medical treatment, whereas this treatment effect was not seen in those having dissections involving only the descending aorta. This finding, therefore, led to the development of the more widely used Stanford classification: type A aortic dissections involve the ascending aorta or the aortic arch, whereas TBADs involve only the descending aorta (**Fig. 2**).

This notion that anatomic distribution of aortic dissections has significant prognostic implications has been supported in numerous subsequent studies.[5–8] One such report examined patient data from the International Registry of Acute Aortic Dissection (IRAD), a large consortium currently comprising 30 referral centers in 11 countries that was established in 1996 to evaluate the current management and outcomes of aortic dissections.[9] Using an early version of this database, Hagan and colleagues[10] reviewed approximately 500 cases of aortic dissections demonstrating results similar to those in Daily and colleagues'[4] article from 3 decades earlier. Patients with type A dissections who underwent surgical repair had lower mortality (26%) than those treated medically (58%), whereas the mortality of those with type B dissections was lower when treated medically (11%) than with surgery (31%). Furthermore, these

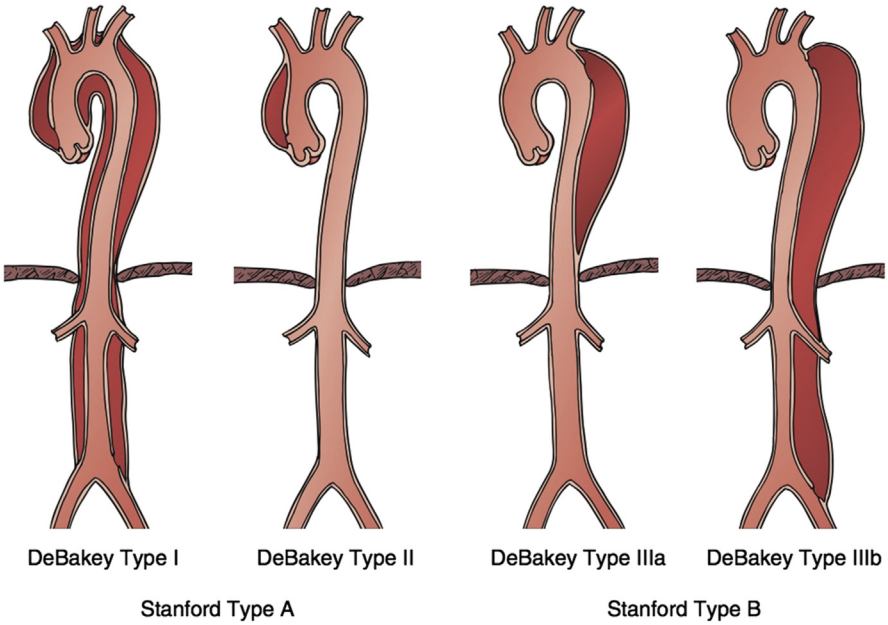

Fig. 2. Classification of aortic dissections by anatomic distribution using the DeBakey and Stanford systems. (*From* Conrad MF, Cambria RP. Aortic dissection. In: Cronenwett JL, Johnston KW, editors. Rutherford's vascular surgery. 8th edition. Philadelphia: Saunders, Elsevier Inc; 2014. p. 2170.e4; with permission.)