Modern Management of Type B Aortic Dissections

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Abstract

Purpose of Review The following describes the recent advancement in the diagnosis, imaging, and treatment of type B aortic dissections. We will review the recent updates of aortic dissection classifications, and potential impact on clinical management.

Recent Findings Type B aortic dissections can be classified anatomically and temporally using the recent Society for Vascular Surgery and Society of Thoracic Surgeons reporting standards. A number of high-risk features have been correlated with poor prognoses with medical management alone, leading to the expansion of indications for thoracic endovascular aortic repair (TEVAR). Emerging data suggest that timing of intervention may play a role in patient outcomes. Special attention to endovascular technique regarding landing zones and device selection can also significantly impact patient outcomes.

Summary Anti-impulse therapy should promptly be initiated for all dissections. Type A dissections continue to depend largely on emergent open surgical intervention, whereas TEVAR remains first line for complicated type b aortic dissections. Uncomplicated type b aortic dissections are historically managed conservatively; however, data continue to emerge suggesting benefits of early endovascular intervention to prevent risk of late aortic degeneration or rupture. These approaches continue to be challenged as growing registry data and progressive endovascular technology develop. Regardless of initial management strategy, continued surveillance is crucial. Widespread utilization of standardized classification systems can aid in understanding the natural history and outcomes of aortic dissections.

Introduction

Acute aortic dissection, initially thought to be rare, has become known as the most common aortic emergency, demonstrating an overall high mortality of up to 30% on presentation [1]. This prompted continued scrutiny of the diagnosis and management of aortic dissections, resulting in the rapid evolution of approaches encompassing medical management, to open and novel endovascular techniques. In this article, we review the classifications, presentation, management, postoperative care, potential complications, and future directions, with a focus on type B aortic dissections.

Classification

Anatomic

Aortic dissections have historically been classified based on anatomic extent and timing of presentation. Anatomically, dissections were described based on location of the primary intimal entry tear and extent of aortic involvement.

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This was first developed by DeBakey in 1965, who stratified dissections as Type I–III (Fig. 1). In this classification system, DeBakey type I dissections have the entry tear in the ascending aorta, and involve the aortic arch through the descending and/or abdominal aorta, whereas Type II dissections have the entry tear and extent confined to the ascending aorta, and Type III dissections have the entry tear and extent confined to the descending and/or abdominal aorta [2]. This was later simplified into the now popular Stanford A, B classification (Fig. 1), which accounts for the location of the entry tear, with type A including those with tears in the ascending aorta, and type B those with tears originating distal to the left subclavian artery [3].

These simple, original classifications allowed for a better understanding of the contrasting natural history and difference in time-dependent clinical outcomes with medical and surgical management of type A and B aortic dissections. For example, International Registry of Aortic Dissections (IRAD) data showed that the 30-day mortality for patients with type A aortic dissections managed medically was significantly higher than those with type A aortic dissections managed surgically. On the other hand, type B aortic dissection patients showed lower 30-day mortality, compared to those who underwent surgery. This observation laid a foundation for the traditional paradigm of surgical management of type A aortic dissections and medical management of type B aortic dissections [4].

With continued research and emergence of clinical data, our understanding of type B aortic dissections became more sophisticated with increasing attention to clinical and radiographical signs of those who harbor higher risk for aortic complications. Furthermore, despite the wide adoption of these simple classification systems, neither

addresses the full range of aortic dissection presentation, for example those with distal entry tears with retrograde extension through the aortic arch, those with entry tears focal to the transverse arch, or those with dissections extending into the great vessels, all of which can significantly impact our understanding of prognosis and outcomes.

Thus, in 2019, the Society for Vascular Surgery (SVS) and Society of Thoracic Surgeons (STS) published a new reporting standard, which contains a classification system more specifically identifying both the location of the entry tear as well as aortic extent involved by zone [5••]. By this classification, aortic dissections are distinguished as type A or B by entry tear location alone, with type A being those with entry tears in zone 0 only. A numeric subscript is then used to denote the zone of distal extent of the dissection. Similarly, type B dissections, which are those with the primary entry tear originating in zone 1 and beyond, utilizes two subscripts to denote the proximal and distal extent of involvement, respectively, regardless of false lumen patency. For example, a dissection with an entry tear at zone 2, retrograde extension to zone 0 and distal extension to zone 9 would be described as $B_{0,9}$. Of note, this does not specify the zone of the entry tear, allowing for inclusion of all dissections from zone 1–9 as a type B dissection. For those with indeterminate entry tears with extension into zone 0, a designation "I" is used in place of "A", and again described with a subscript to describe the distal extent of the dissection. (Fig. 2), Those with new acute on chronic presentations are described based on both the historic and new pathology, while those with prior repairs, for example open aortic reconstructions, can be described based on residual disease. Furthermore, intramural
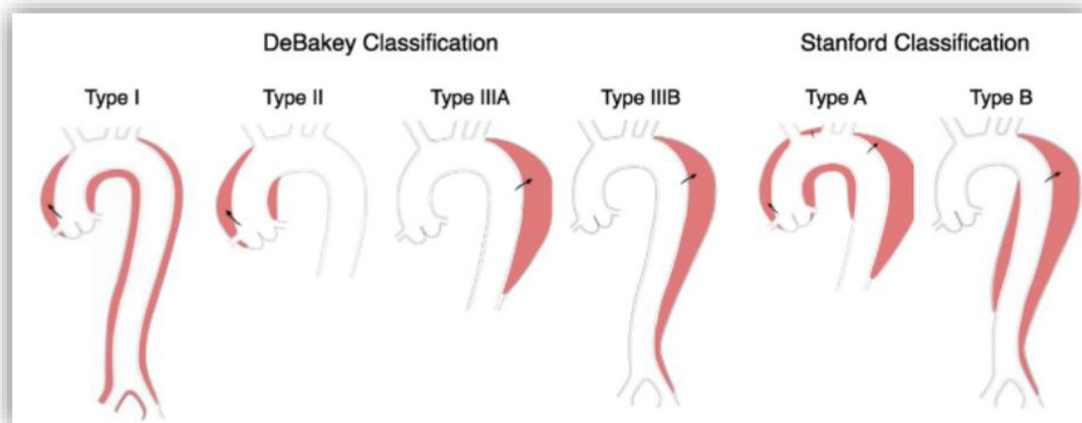

Fig. 1 DeBakey and Stanford classifications for aortic dissections. (Lombardi JV, Hughes GC, Appoo JJ, Bavaria JE, Beck AW, Cambria RP, Charlton-Ouw K, Eslami MH, Kim KM, Leshnower BG, Maldonado T, Reece TB, Wang GJ. Society for vascular surgery (SVS) and Society of thoracic surgeons (STS) reporting standards for type B aortic dissections. J Vasc Surg 2020;71(3):723–747. https://doi.org/10.1016/j.jvs.2019.11.013

hematomas (IMH), a separation of the aortic wall layers without an identifiable entry tear, as well as penetrating aortic ulcers (PAU), ulcerations into the aortic wall secondary to atherosclerotic lesions, are two related aortic syndromes which can similarly be described using subscripts to denote zones involved (e.g., $PAU_{2,5}$ and $IMH_{3,7}$).

Temporal

In addition to anatomic classification, the SVS/STS sought to incorporate a temporal classification. This was initially born out of the observation that mortality most rapidly increased in the first 14 days, supporting the idea of an "acute" phase of aortic dissections [4]. Subsequent studies then demonstrated the influence of chronicity on morbidity and mortality [6], as well as visible changes in flap morphology on computed tomography (CT) imaging depending on acuity of the aortic dissection [7]. Thus, the new reporting standards classify hyperacute as < 24 h, acute 1–14 days, subacute 15–90 days, and chronic > 90 days from symptom onset. With these new SVS/STS reporting standards of aortic dissections, further research can be framed with more granularity, allowing us to gain a deeper understanding of the factors influencing clinical outcomes, as well as a more standardized evaluation of novel treatment strategies.
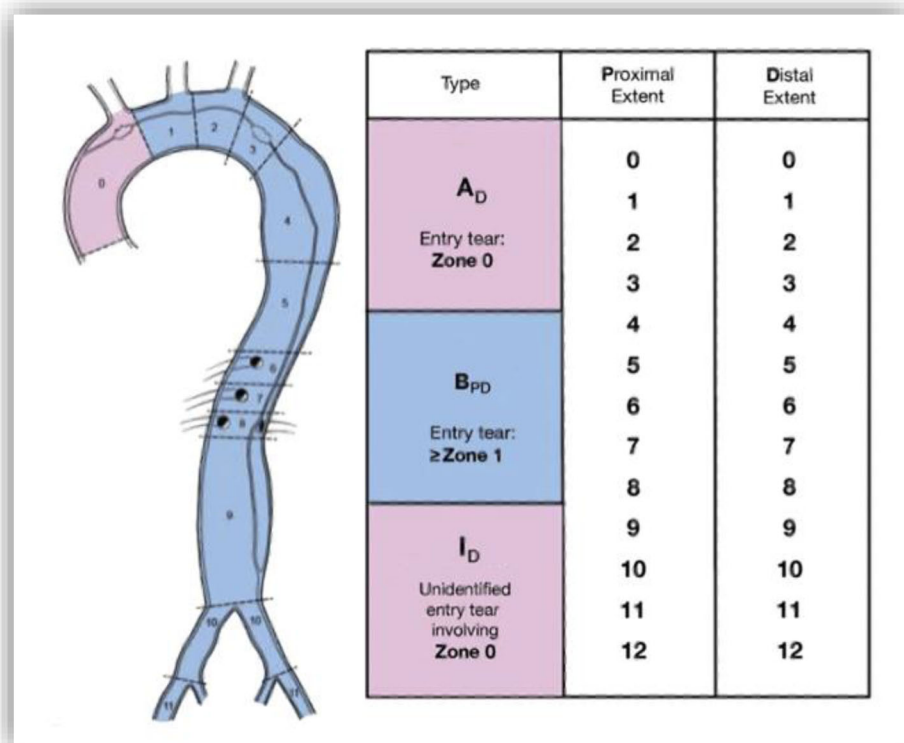
Risk Factors, Presentation and Diagnosis

The classic risk factor for aortic dissection is hypertension, with other known risk factors being cocaine use, trauma, pregnancy, atherosclerosis, and genetic disorders such as inherited connective tissue disorders including Marfan syndrome, Loeys-Dietz syndrome, and Ehlers-Danlos syndrome.

Patients typically present with abrupt onset back, chest, or abdominal pain that is tearing in nature, often in the context of hypertension, or even cardiac tamponade or aortic valve complications for type A and retrograde type B dissections, and syncope or neurologic symptoms if there is involvement of the arch vessels. If the dissection extends into branch or peripheral vessels, patients may also present with symptoms of the corresponding end-organ such as renal failure or limb ischemia.

This heterogenous presentation prompted more descriptive terms of type B aortic dissections (TBAD) as complicated or uncomplicated. Complicated aortic dissections are those that present with rupture or clinical evidence of malperfusion, commonly affecting the renal, visceral, iliofemoral, and spinal vascular beds. Malperfusion can further be described as being caused by *dynamic* obstructions whereby the intimal flap is mobile with each cardiac cycle causing intermittent obstruction, or *static* obstructions which are caused by continuous false lumen

Fig. 2 Society for vascular surgery and society of thoracic surgeons aortic dissection classification system. (Lombardi JV, Hughes GC, Appoo JJ, Bavaria JE, Beck AW, Cambria RP, Charlton-Ouw K, Eslami MH, Kim KM, Leshnower BG, Maldonado T, Reece TB, Wang GJ. 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. https://doi.org/10.1016/j.jvs.2019.11.013

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

pressurization creating constant obstruction (Fig. 3). Given the associated morbidity and mortality, complicated type B aortic dissections require prompt surgical (open or endovascular) management.

Uncomplicated aortic dissections are those without evidence of rupture or end-organ malperfusion and are typically managed medically. However, a number of studies have identified radiographic signs that are associated with increased risk for aortic events and late aneurysmal degeneration, and thus failure of medical management alone. For example, an entry tear located along the lesser curve was found to be more commonly associated with retrograde extension of the dissection [8, 9]. Furthermore, larger entry tears resulted in higher false lumen pressurization leading to increased false lumen degeneration [10]. Other studies evaluating the primary location for late aneurysmal degeneration demonstrated that the upper descending thoracic aorta was the major site for late ($\geq$ 2 years) aneurysmal dilatation, and false lumen diameters $\geq$ 22 mm showed higher aneurysm and death rates, suggesting the need for earlier intervention [11]. Thus, based on these and other studies, the SVS/STS reporting standards suggest specifying "high-risk" features which include a maximum trans-aortic diameter > 40 mm on presentation, primary entry tear along the lesser curve, primary entry tear > 10 mm, and false lumen diameter > 22 mm (Table 1). This concept of "high-risk, uncomplicated" aortic dissections has since been adopted at many centers as expanded indications for endovascular aortic repair.

Given the described criteria above, diagnostic imaging, most commonly CT imaging, is crucial in the rapid diagnosis and appropriate management of aortic dissections. While less sensitive and specific, plain radiography can demonstrate a widened mediastinum or identify pleural effusions, and echocardiography can delineate involvement of the ascending aorta.

Management

Initial Management Strategy

Prompt initiation of medical treatment including anti-impulse therapy (systolic blood pressure 100–120 mmHg, mean arterial pressure 60–70 mmHg, heart rate < 60 beats per minute) and pain control should be applied for all patients upon the diagnosis of an aortic dissection. Medical treatment is aimed at reducing the hemodynamic stresses on the aortic wall and minimizing risk of aortic dissection propagation. The utility of medical management was described by Kodama et al. who reviewed 171 patients with acute aortic dissection, demonstrating a reduction in aortic events (organ or limb ischemia, rupture, recurrent dissection, pathologic aortic expansion, aortic surgery) when both blood pressure and tight heart rate control were achieved [12]. Furthermore, analysis of the IRAD global registry database found that the use of beta-blockers was associated with improved survival in all patients including those with type A dissections, and calcium channel blockers were associated with improved survival in type B aortic dissections, while ACE-Inhibitors had no association with mortality [13].

Subsequent management of aortic dissection is primarily determined by classification of the dissection. While open definitive surgical treatment has been well established for type A acute aortic dissections given the potentially lethal complications such as tamponade, rupture, myocardial infarction, and stroke, type B aortic dissections (TBAD) have historically been approached with more conservative measures given the high morbidity and mortality associated

Fig. 3 Static versus dynamic obstruction causing malperfusion in aortic dissection. (Lombardi JV, Hughes GC, Appoo JJ, Bavaria JE, Beck AW, Cambria RP, Charlton-Ouw K, Eslami MH, Kim KM, Leshnower BG, Maldonado T, Reece TB, Wang GJ. 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. https://doi.org/10.1016/j.jvs.2019.11.013
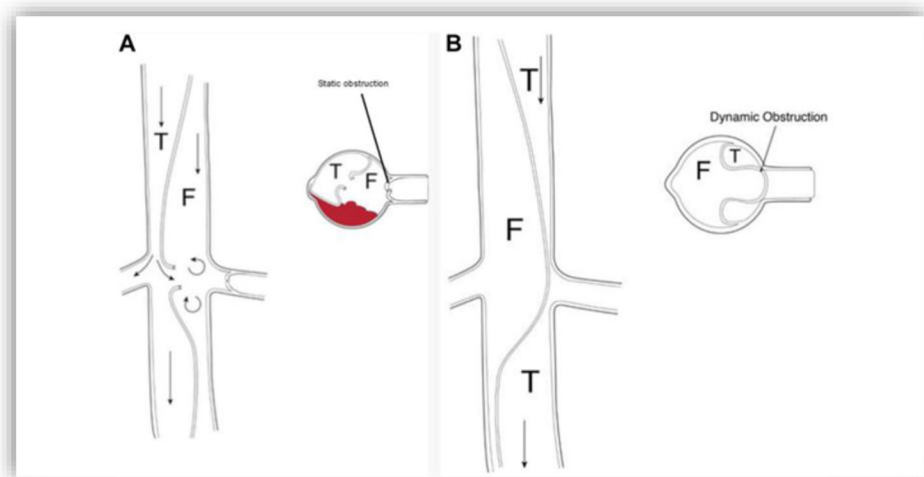
Table 1 Presentation of acute aortic dissections

Uncomplicated
No rupture
No malperfusion
No high-risk features
High risk
Refractory pain
Refractory hypertension
Bloody pleural effusion
Aortic diameter > 40 mm
Radiographic only malperfusion
Readmission
Entry tear: lesser curve location
False lumen diameter > 22 mm
Complicated
Rupture
Malperfusion

with open repair, prior to the wide adoption of thoracic endovascular aortic repair (TEVAR). The initial application of TEVAR was primarily focused on complicated dissections i.e., rupture or impending rupture, malperfusion, or failed medical therapy, with such application of TEVAR demonstrating favorable clinical and anatomical outcomes at 30-days, 1-year, and 2-year follow-up on prospective multicenter trials [14, 15], as well as more favorable perioperative outcomes when compared to open repair, now with emerging data on long-term outcomes of TEVAR in complicated dissections [16]. Furthermore, a number of high-risk features (as outlined above) have been identified as predictors of medical treatment failure, in which the indications for TEVAR has been expanded.

As endovascular technology continues to evolve, the conservative management strategy of uncomplicated aortic dissections has been challenged. Studies demonstrate lower long-term mortality after TEVAR for TBAD with a majority of patients failing medical therapy over time [17, 18]. Furthermore, while the first randomized control trials (INSTEAD) demonstrated comparable 2-year survival and adverse event rates between optimal medical therapy and TEVAR for uncomplicated aortic dissections, follow-up analysis demonstrated decreased mortality and disease progression beyond 2 years up to 5 years (INSTEAD-XL) [19]. This trial as well as the ADSORB trial [20] demonstrated notable disease progression and

aneurysmal degeneration in almost half of the patients by one year, with many requiring aortic-related reintervention due to false lumen degeneration, at which point aortic involvement can be more extensive requiring more complex repairs. This is in contrast to favorable aortic remodeling with true lumen recovery and false lumen thrombosis in > 90% of patients who underwent TEVAR [21]. These results shifted the practice of using TEVAR beyond just complicated and high-risk aortic dissections, towards potentially all uncomplicated aortic dissections in efforts to mitigate future degeneration and need for aortic reintervention. This shift to achieve false lumen thrombosis and favorable aortic remodeling is echoed by Tsai et al., who demonstrated that partial thrombosis of the false lumen during the index hospitalization is associated with delayed post-discharge mortality as compared with those with no thrombosis of the false lumen [22].

Timing of Intervention

The optimal timing of TEVAR also continues to be controversial, as the only level 1 data regarding TEVAR in TBAD contained selection bias regarding the timing of TEVAR. The INSTEAD trial excluded acute (< 14 days) dissections with a median time to intervention of 57 days, whereas ADSORB only included acute dissections, with TEVARs performed within 48 h of randomization. Determining the optimal timing of intervention prompts questions regarding the risk for retrograde type A dissections and procedural complications when intervening acutely, against the benefits of long-term prevention of aortic degeneration and complications. It also questions the benefit of intervening on chronic dissections where aortic remodeling may not be easily achieved. In an effort to identify the potential complications associated with the timing of TEVAR for uncomplicated aortic dissections, an analysis of the vascular quality initiative (VQI) TEVAR registry was published in 2021, suggesting that TEVAR within 14 days versus 15–90 days of presentation, does not predict mortality or postoperative complications, although there was a strong association between repair within 14 days and a higher risk of reintervention, which may have been a reflection of the complexity of cases within that time period [23•]. Given the paucity of data and consensus on this topic, ongoing studies continue to evaluate optimal timing of TEVAR for uncomplicated dissections.

Regardless, the promising successes of endovascular management have since made open surgical repair for descending aortic dissections largely disfavored. Open repair is now reserved for patients with threatened or ruptured aortas with no identifiable proximal seal zone in those who are otherwise appropriate surgical candidates, or those with connective tissue disorders, although this too

has been challenged with increasing use of TEVAR for connective tissue disorders demonstrating low perioperatively mortality, spinal cord ischemia, and stroke [24].

Technical Considerations

In addition to timing, appropriate technique has become increasingly of interest and is critical for successful outcomes after TEVAR. Special consideration must be given to the proximal and distal landing zones, as well as device selection and sizing, and branch incorporation.

Device Landing Zone

The traditional proximal landing zone length recommendation for degenerative aneurysms has been 2 cm of healthy aorta. However, on a review comparing 71 patients who underwent TEVAR for TBAD with proximal seal zones with and without intramural hematomas (IMH), achieving a full 2 cm of normal aortic seal zone would have required coverage of all three arch branch vessels in 31 (43.7%) patients [25•] (Fig. 4). Conversely, all patients [3] who developed retrograde type A dissections had seal zones entirely in IMH, while none occurred in those with proximal seal zones involving healthy aorta, suggesting that some proximal seal zone in normal aorta without IMH may avoid retrograde dissection and induce favorable aortic remodeling. In our opinion, the proximal extent of aortic dissection, not just the location of the entry tear alone, should be a determining factor in choosing the proximal landing zone, with an aim to maximize landing within healthy, disease-free aortic walls.

Similarly, the distal landing zone is of particular importance, as suboptimal stent graft placement and sizing can result in stent-induced new entry tears (SINE) (Fig. 5) and is associated with substantial mortality and aortic reintervention [26, 27]. Furthermore, increased aortic coverage is associated with increased risk for spinal cord ischemia [28•]. Spinal drainage and careful intraoperative and postoperative blood pressure management are some ways to mitigate this risk of spinal cord ischemia, and emerging data now suggest that more extensive coverage through the celiac artery during TEVAR may not be associated with increased rates of perioperative mortality or spinal cord ischemia, but rather may improve thoracic aortic remodeling after TEVAR [29, 30]. Thus, clinician judgment with consideration of case-specific presentation, anatomy, and acuity should be considered when evaluating for distal landing zones.

Device Selection

With the proximal and distal landing zones determined, appropriate devices should be considered. Covered stents (stent grafts) should always be utilized for the proximal entry tear given the high risk for iatrogenic complications as well as likelihood for continued false lumen perfusion resulting in progressive degeneration and potential true lumen/stent collapse when using uncovered stents [31]. For complicated dissections, composite arrangements of covered stents proximally with distal uncovered dissection stents can be utilized to promote laminar flow and true lumen expansion without increasing aortic coverage [15].

Furthermore, devices should be oversized by no more than 10%, contrary to the traditional 20% oversizing used for degenerative aneurysms. While the axial images of CT angiography (CTA) is rapid and readily available, there can be significant inter- and intra-observer variability [32]. Instead, CTA with three-dimensional reconstruction and centerline measurements have become the standard for stent graft sizing.

The utility of intravascular ultrasound (IVUS) has also been assessed in TEVAR for TBAD. In addition to aiding in true lumen catheterization, IVUS can provide dynamic, orthogonal imaging of the aorta along the path of the stent
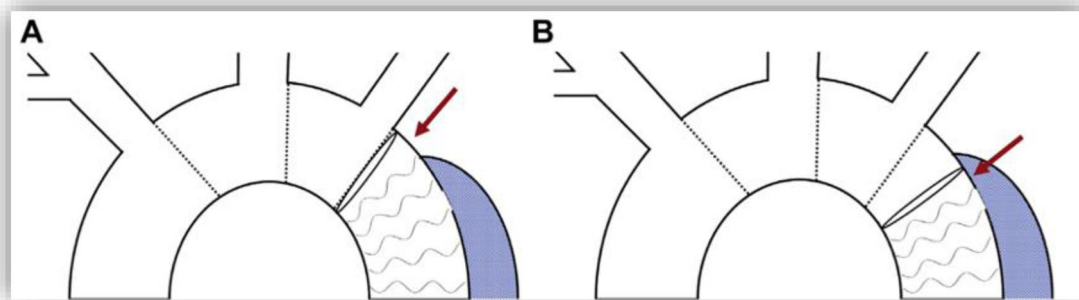

Fig. 4 A Proximal seal zone in normal aorta. **B** Proximal seal zone in intramural hematoma. (Kuo EC, Veranyan N, Johnson CE, Weaver FA, Ham SW, Rowe VL, et al. Impact of proximal seal zone length and intramural hematoma on clinical outcomes and aortic remodeling after thoracic endovascular aortic repair for aortic dissections. J Vasc Surg 2019;69(4):987–995

Fig. 5 Stent-induced new entry tear (SINE). (Lombardi JV, Hughes GC, Appoo JJ, Bavaria JE, Beck AW, Cambria RP, Charlton-Ouw K, Eslami MH, Kim KM, Leshnower BG, Maldonado T, Reece TB, Wang GJ. 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. https://doi.org/10.1016/j.jvs.2019.11.013

graft, and assess variations secondary to changes with the cardiac cycle or the patient's volume status to provide real-time estimations for stent graft sizing. IVUS demonstrated high correlation with CTA, especially at the base of the left subclavian. However, it should be noted that it may over-estimate aortic diameters with the most discrepancy, when compared to CTA, at angulated portions of the aorta [33].

Branch Considerations

The subclavian artery provides collateral circulation for the spinal cord as well as contributes to posterior cerebral circulation. However, strategies to achieve adequate prox-imal landing zones often require coverage of the left sub-clavian artery. Although some studies suggest increased risk of stroke and spinal cord ischemia [34] with subclavian artery coverage and improved rates with revascularization [35], others demonstrate no significant difference in peri-operative morbidity [36]. Thus, some practitioners rou-tinely revascularize the left subclavian artery when coverage is needed to achieve adequate seal zones, while others have adopted a more selective approach with adjunct subclavian revascularization.

Traditional open techniques for subclavian artery revascularization include carotid-subclavian bypass or transposition. Total endovascular left subclavian artery incorporation can be achieved by use of parallel grafting, in-situ fenestration, and branched/fenestrated endografts [37–51], with promising early outcomes. Furthermore, custom and off-the-shelf branched/fenestrated stent grafts designed for subclavian artery incorporation are in clinical trials, and in the future may offer options for endovascular repair of arch pathology including aortic dissections.

Other Considerations

Other practical considerations include minimizing the use of balloon molding given the aortic fragility associated with dissections, as well as identifying adequate peripheral access whereby the pulseless or weaker femoral pulses often predicts easier access into the true lumen.

Technique for Complicated Dissections

Patients presenting with rupture should have the proximal tear covered first, with distal extension as needed. Malperfusion poses a particular challenge, as the often more extensive dissection with potentially multiple fenes-trations and dynamic flap can make accurate identification of the true lumen especially difficult. In such cases, IVUS can be an extremely useful tool in identifying the dissec-tion. The proximal tear should again be sealed first fol-lowed by an aortogram downstream to identify the need for further intervention. Branch intervention should be done on a case-by-case basis pending the severity of the clinical presentation of malperfusion, as there is currently no evi-dence to suggest a benefit for pre-emptive branch inter-vention [52]. If there is any concern for branch occlusion intraoperatively, it is crucial to maintain wire access and potentially place stents within the branch, as well as per-form endofenestration of the intimal flap as needed to maintain perfusion.

Approach for Chronic Dissections

Aneurysmal degeneration due to persistent false lumen perfusion is a primary concern for aortic dissections in the chronic phase. Persistent false lumen perfusion can be addressed by embolization using amplatzer plugs, or spe-cialized techniques such as the knickerbocker technique [53] whereby an oversized stent graft is deployed within the true lumen and used to create a controlled rupture of the dissection flap upon inflation of a large compliant balloon. The aim of this technique is to occlude the false lumen and promote proximal thrombosis while preventing continued false lumen perfusion. Other techniques, such as the candy-

plug technique, utilizes implantation of a modified candy-shaped stent graft in the false lumen aneurysm, again to promote false lumen occlusion and subsequent aortic remodeling [54, 55]. The petticoat technique utilizes a bare metal stent for chronic type B dissections (with additional covered stents within the bare metal stent as parallel iliac stent grafts for the "extended" petticoat technique) to promote favorable remodeling and stabilize aortic diameters [56, 57].

In cases where the dissection significantly degenerates, strategies used to repair primary thoracoabdominal or complex abdominal aortic aneurysms can be applied. For example, complex endovascular aortic repair including custom-manufactured or physician-modified fenestrated-branched stent grafts can be utilized [58–62]. This approach incorporates tailor-made fenestrations, branch cuffs, and/or inner branches on aortic stent grafts in order to create an endovascular repair with adequate seal zones in anatomy otherwise unable to be addressed by standard infrarenal endovascular aortic stent grafts. This technology now continues to develop in hopes for off-the-shelf availability [63] for both primary aneurysmal and dissection-related aneurysmal disease.

Open repair remains an option and is traditionally considered the gold standard for durability. This approach utilizes synthetic or homografts for aortic replacement [64, 65]. Open repairs require adequate preoperative risk assessments and serious consideration of the risks and benefits given the increased morbidity and mortality often associated with such extensive repairs [66]. Hybrid repairs have also demonstrated success, which begins with open aortic debranching followed by concomitant or staged endovascular graft placement [67, 68]; however, again this approach can come with considerable morbidity [69] and is reserved for selective surgical candidates.

Postoperative Care and Surveillance

As we continue to understand the natural history of aortic dissections, it has become clear that regardless of initial management strategy, follow-up and surveillance are crucial for preventing late aortic complications.

As demonstrated in the INSTEAD and ADSORB trials, as well as IRAD registry data, medically managed aortic dissections often result in late aneurysmal degeneration at which point they may be more extensive, requiring more complex repairs. It should be noted, however, that patients who undergo TEVAR for acute aortic dissection are not protected from aneurysmal degeneration in unstented portions of the aorta [70]. This is in contrast to the prognosis of abdominal branches, which maintain stable branch perfusion with high intervention-free patency through the

midterm period [52]. Thus, follow-up is primarily for aortic surveillance. Should a complication be identified during surveillance, patients can be evaluated for TEVAR, EVAR, hybrid, open, or fenestrated-branched endovascular aortic repairs as described above, depending on anatomic suitability and patient eligibility.

Conclusions

The literature on aortic dissections is continuously evolving as registries and endovascular technology develop. Although clear consensus on the management of aortic dissection can be difficult to obtain, it is becoming increasingly clear that this pathology and its related complications and natural history are significantly more complex than previously understood. The management of aortic dissections has shifted based on outcome-dependent nomenclature and classifications, and now with more focused efforts to standardize our definitions and outcomes, we can become increasingly deliberate about management strategies. Presently, the initial mainstay therapy for all dissections includes anti-impulse therapy. Type A dissections continue to depend largely on emergent open surgical intervention, while the management of type B dissections can range from medical management for uncomplicated dissections, to emergent TEVARs with or without adjunct procedures for complicated dissections and elective TEVARs for uncomplicated high-risk dissections. These approaches however continue to be challenged as newer endovascular devices develop such as arch fenestrated-branched stent grafts. Open surgical repair is largely reserved for patients without endovascular options who are otherwise acceptable surgical candidates, and those with connective tissue disorders. Continued patient compliance and surveillance are crucial for preventing long-term adverse outcomes.

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