DISSECT: A New Mnemonic-based Approach to the Categorization of Aortic Dissection

M.D. Dake a,*, M. Thompson b, M. van Sambeek c, F. Vermassen d, J.P. Morales e, on behalf of the DEFINE Investigators

Objective/Background: Classification systems for aortic dissection provide important guides to clinical decision-making, but the relevance of traditional categorization schemes is being questioned in an era when endovascular techniques are assuming a growing role in the management of this frequently complex and catastrophic entity. In recognition of the expanding range of interventional therapies now used as alternatives to conventional treatment approaches, the Working Group on Aortic Diseases of the DEFINE Project developed a categorization system that features the specific anatomic and clinical manifestations of the disease process that are most relevant to contemporary decision-making.

Methods and results: The DISSECT classification system is a mnemonic-based approach to the evaluation of aortic dissection. It guides clinicians through an assessment of six critical characteristics that facilitate optimal communication of the most salient details that currently influence the selection of a therapeutic option, including those findings that are key when considering an endovascular procedure, but are not taken into account by the DeBakey or Stanford categorization schemes. The six features of aortic dissection include: duration of disease; intimal tear location; size of the dissected aorta; segmental extent of aortic involvement; clinical complications of the dissection, and thrombus within the aortic false lumen.

Conclusion: In current clinical practice, endovascular therapy is increasingly considered as an alternative to medical management or open surgical repair in select cases of type B aortic dissection. Currently, endovascular aortic repair is not used for patients with type A aortic dissection, but catheter-based techniques directed at peripheral branch vessel ischemia that may complicate type A dissection are considered valuable adjunctive interventions, when indicated. The use of a new system for categorization of aortic dissection, DISSECT, addresses the shortcomings of well-known established schemes devised more than 40 years ago, before the introduction of endovascular techniques. It will serve as a guide to support a critical analysis of contemporary therapeutic options and inform management decisions based on specific features of the disease process.

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The constellation of cardiovascular pathologies encountered in clinical practice is broad and includes a variety of complex disease processes. No condition, however, is consensually regarded by medical students and experienced clinicians alike as more complicated, ominous, and vexing than aortic dissection. Aortic dissection is a catastrophic event responsible for a wide range of clinical manifestations. In any individual, the particular effects experienced are related to the pattern and extent of aortic and branch vessel involvement that occurs as a consequence of the dissection, and, in the longer term, the ability of the aorta to resist the dilating forces of the circulation.

Originally described by Morgagni in 1761, aortic dissection remained a highly lethal disease for which no effective therapy, including medical treatment, was available until 1955, when surgical repair was introduced. For the first time, there was a treatment that appeared to favorably alter the natural history of the disease. From the early experience gained with operative management, it became apparent that there are distinct differences between patients with dissection involving the ascending aorta, who have a worse immediate prognosis, and those with descending aortic dissection. The importance of this differentiation was initially recognized by Hume and Porter, later emphasized in the two most commonly referenced classification systems—the DeBakey and Stanford systems proposed in 1965 and 1970, respectively (Table 1).

Subsequently, diagnostic imaging with catheter arteriography, echocardiography, computed tomography, and magnetic resonance scans has contributed to our collective understanding of the patterns of anatomic involvement
observed with this pleomorphic disease. In turn, this evolution in the general appreciation of the variety of manifestations and unique anatomic expressions of aortic dissection facilitated a progressive refinement in the methods used to categorize the subtypes of patients commonly recognized.9–12 Successively, these alternative classification systems embraced some of the previously unaddressed anatomic features, but they remained either incomplete or pragmatically too complex to be used widely in clinical practice.

More recently, endovascular stent-grafts, first applied to the repair of descending thoracic aneurysms13 and then extended to other thoracic aortic diseases, including acute and chronic dissections,14,15 have emerged as a therapeutic alternative to both medical and surgical therapy, and has widened the therapeutic options for the treatment of aortic dissections. The best classification systems in medicine are those that are universally adopted and used daily. For the most part, this is because they take into consideration all patients, define discriminating criteria that are distinct among individual subgroups, and are clinically informative in a manner that meaningfully influences medical decisions. The global acceptance of thoracic endovascular aneurysm repair techniques for the management of acute and chronic forms of aortic dissection invites the development of a new categorization scheme that includes the specific elements that are most relevant when considering endograft placement in the therapeutic decision tree.

The two most commonly adopted classification schemes for dissection—the DeBakey and Stanford systems—are both in widespread use and generally well understood. They both work extremely well in the context of patients requiring a decision regarding open surgical repair or conservative medical therapy. Thus, it is important to recognize that any new classification should build on the strengths of these established systems.

Although both the DeBakey and Stanford classifications have been established for more than 40 years, there is no consensus regarding which is preferred. What can be said is that both were developed prior to the use of sophisticated diagnostic imaging modalities during an era of limited surgical options when the intent was simply to group patients into categories based on the advisability of surgery or medical treatment, and not to explore the full extent of disease characteristics that may critically influence both immediate- and longer-term outcomes.

From the perspective of a contemporary cardiovascular practice that incorporates endovascular management, as

Table 1. The DeBakey and Stanford Classifications Systems of Aortic Dissection.

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristic</th>
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<tbody>
<tr>
<td>DeBakey4</td>
<td>Originates in the ascending aorta, but extends distally and involves the descending aorta</td>
</tr>
<tr>
<td>II</td>
<td>Originates in and is confined to the ascending aorta</td>
</tr>
<tr>
<td>III</td>
<td>Originates in and involves the descending aorta</td>
</tr>
<tr>
<td>Stanford8</td>
<td>A Involves the ascending aorta irrespective of the site of origin</td>
</tr>
<tr>
<td>(1970)</td>
<td>B Involves the descending aorta exclusively</td>
</tr>
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for the features that are critical to making a therapeutic decision in the 21st century. Endovascular treatment has emerged as a viable alternative to both medical and surgical therapy, and has widened the therapeutic options for the treatment of aortic dissections. The best classification systems in medicine are those that are universally adopted and used daily. For the most part, this is because they take into consideration all patients, define discriminating criteria that are distinct among individual subgroups, and are clinically informative in a manner that meaningfully influences medical decisions. The global acceptance of thoracic endovascular aneurysm repair techniques for the management of acute and chronic forms of aortic dissection invites the development of a new categorization scheme that includes the specific elements that are most relevant when considering endograft placement in the therapeutic decision tree.

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From the perspective of a contemporary cardiovascular practice that incorporates endovascular management, as

Figure 1. Axial computed tomography images of a patient with an acute aortic dissection and a primary intimal tear in the ascending segment of the aorta.
well as, medical and open surgical treatments, there are problems with the current classifications systems. Both are not particularly well-suited to adapt to the increasing practice of endovascular repair because neither precisely encompasses primary entry tears located in the aortic arch, allows for definition of an intermediate period from onset of symptoms that is between acute and chronic groups (i.e., a sub-acute group), assesses the direction of dissection extension (antegrade, retrograde, mixed), takes into account distal complications secondary to acute or chronic branch vessel occlusion, nor discriminates based upon patency of the aortic false lumen.

The goal of the DISSECT classification system is to provide an easy to assimilate and memorable method of accounting for the critically important factors that influence contemporary decision-making for the management of aortic dissection. It is hoped that this mnemonic-based approach will actually simplify the data between healthcare providers by prompting their focus on a series of categories that comprise the most salient clinical and imaging findings requiring assessment during the acute evaluation of dissection, a frequently complicated process.

It is not the intent of the DISSECT categorization to dictate split-second emergent dispositions, but rather to provide a framework that facilitates communication regarding the key aspects of aortic dissection that influence its contemporary management. It is hoped that it will supplement the traditional DeBakey and Stanford classification schemes by encompassing the critical anatomical

Figure 2. Large primary entry tear evident in the descending aortic segment in a patient with acute dissection.

Figure 3. Trans-aortic dimensions measured from an axial computed tomography image performed at the level of the maximum aortic diameter in a patient with chronic aortic dissection.
factors these two systems consider, and also to recognize key clinical manifestations and additional imaging data that now inform and influence contemporary management considerations. The system might additionally be used to ensure standardization of morphologic and pathophysiologic parameters reporting outcomes of treatment.

The premise of the categorization is based on the determination of six factors: duration of dissection; site of

Figure 4. Axial computed tomography angiography depicts the primary tear location and associated posterior rupture of the descending aorta in a 30-year-old woman with back pain immediately post-partum.

Figure 5. Computed tomography diagnostic imaging in a 64-year-old man with acute chest and back pain details an aortic dissection that extends into the aortic arch and is complicated by rupture of the descending segment with associated mediastinal and pleural blood/hematoma.

Figure 6. Static branch vessel involvement of the superior mesenteric artery (SMA) is evident on these axial computed tomography images from a patient with acute dissection. Anatomically, this branch vessel complication occurs when the intimal flap of the dissection extends directly from the aorta into one of its branches. Depending on a number of factors, this branch involvement may be associated with clinical symptoms and ischemic sequelae. In this case, the aortic true lumen is small and located anterior. The dissection septum intersects the SMA and extends into the branch, bisecting the artery, and creating dual channel or “double barrel” flow in the vessel. The resultant diminutive true channel hugs the right side of the branch as it courses distally.
the primary entry tear; size of the dissected aorta; extent of aortic involvement; clinical complications, and status of the aortic false lumen. A classification system is proposed that encompasses these five features characterized by the mnemonic DISSECT: duration, intimal tear, size of aorta, segmental extent of involvement, clinical complications, and thrombosis of false lumen.

1. Duration of dissection is defined as time from onset of symptoms.
   - Ac = acute: < 2 weeks from initial onset of symptoms.
   - Sa = subacute: 2 weeks to 3 months after symptom onset.
   - Ch = chronic: > 3 months from initial symptoms.

Any classification system for aortic dissection must ensure that the duration of the pathology is defined and characterized. The duration of dissection has significance with respect to prognosis, treatment, and response to therapy. In the future, it is anticipated that the arbitrary labels of acute, subacute, and chronic for the duration of dissection will be replaced by indicating simply the time (days, months or years) since the patient experienced the symptoms that prompted the diagnosis.

Prognostically, acute dissection is more likely to be associated with life-threatening complications than either subacute or chronic dissection. Acute dissection of the ascending aorta has a poor prognosis when treated medically, with approximately 60% of patients dying in the short
term owing to complications of the disease, while the outcome for acute dissection of the descending thoracic aorta is less poor, with an initial hospital mortality rate of about 13%. By contrast, the natural history of chronic dissections is relatively benign in comparison to the acute state. Winnerkvist et al. reported that the actual survival rate of patients with medically-treated chronic type B dissections was 82% at 5 years and 69% at 10 years. This relatively benign prognosis in the chronic state was confirmed by Tsai et al., who reported 78% survival at 3 years for patients with medically-treated type B dissection.

The lower incidence of life-threatening complications in the chronic state is reflected in treatment patterns. Chronic dissections are more likely to be treated non-urgently than acute dissections, and recent series have suggested that endovascular therapy for chronic type B dissection has a lower mortality and complication rate than therapy for acute type B dissection.

The chronicity of the dissection also has relevance with regard to aortic remodeling after endovascular therapy, which is significantly greater in patients with acute dissection. Endovascular repair of acute dissection is associated with rapid expansion of the true lumen and collapse of the false lumen. In contrast, endovascular treatment for chronic dissection can induce false lumen thrombosis in the treated segment, but is not associated with significant change in true and false lumen diameters.

The proposed DISSECT classification system also includes a category of subacute dissection, as there is increasing evidence that this condition is distinct from both acute and chronic presentations. Subacute dissection is characterized by a period of transition between acute and chronic phases, often lasting several weeks to months. The clinical presentation may include intermittent symptoms and variable aortic remodeling patterns.

Figure 9. Illustration of branch vessel compromise due to dynamic branch involvement or aortic true lumen collapse in a 52-year-old man with acute dissection complicated by azotemia, back, and abdominal pain. In this example of a complicated aortic dissection, the anterior located aortic true lumen (arrows) is nearly obliterated and dwarfed by a large false lumen. In contradistinction to static branch involvement, in this form of branch vessel compromise the aortic septum does not extend directly into a branch artery, but instead it prolapsed like a curtain over the ostia of vessels originating from the true lumen. When this occurs, the true lumen is most commonly located along the anterior aspect of the aorta in its distal descending and abdominal segments. Thus, the celiac and superior mesenteric arteries with their anterior origins are often affected by poor in-flow from a compromised aortic true lumen that is frequently crescentic or slit-like in appearance. In this case, both of these vessels are affected, but, in addition, the renal arteries have relatively anterior origins and are also involved.
evidence that these patients may show a degree of aortic remodeling with endovascular therapy, and there is likely to be considerable discussion in forthcoming years about identification of subgroups of patients with uncomplicated acute dissection who are at high risk of rapid disease progression and who will benefit from endovascular therapy in the subacute phase. The exact time period to define subacute dissection may require re-evaluation when further research studies better define the plasticity of the aorta at differing time points.

2. Intimal tear (primary) location within the aorta.
   - A = ascending aorta (Fig. 1).
   - Ar = aortic arch.
   - D = descending aorta (Fig. 2).
   - Ab = abdominal aorta.
   - Un = unknown.

The location of the primary entry tear directly influences the DeBakey and Stanford systems of classification, and commonly defines the indication for emergency surgical intervention. Classification of the primary entry tear is clearly essential in defining dissection, but recent advances in imaging have confirmed that entry tears are often identified in the aortic arch and in the abdominal aorta, as well as in the ascending and descending thoracic aorta. Entry tears in the aortic arch and abdominal aorta are not specifically characterized in previous classification systems and they provide no means of describing vital information regarding the direction(s) of dissection propagation.

3. Size of aorta based on the maximum trans-aortic diameter measured by centre line analysis (true lumen) in millimetres at any level within the dissected segment of aorta (Fig. 3).

4. Segmental extent of aortic involvement from proximal to distal boundary.
   - A = ascending aorta exclusively.
   - Ar = aortic arch exclusively.
   - D = descending exclusively.
   - Ab = abdomen exclusively.
   - AAr = ascending to arch.
   - AD = ascending to descending.
   - AAb = ascending to abdomen.
   - AI = ascending to iliac.
   - ArD = arch to descending.
   - ArAb = arch to abdomen.
   - ArI = arch to iliac.
   - DAb = descending to abdomen.
   - DI = descending to iliac.

The segmental extent of the aortic dissection defines the longitudinal involvement of the dissected aorta and also defines the likely location of secondary fenestrations in the aortic lamella. The distal extent of the aortic dissection

Figure 10. Comparison of axial computed tomography images at the level of the aortic arch performed when a patient was admitted for evaluation of acute chest and back pain (top row), and 4 days later when he experienced another episode of pain (bottom row). Interval proximal extension of the dissection process is evident with progression of aortic involvement from the descending segment into the ascending and aortic arch (arrows).
Axial computed tomography images from the level of the mid-aortic arch extending distal to the aortic root illustrate an aortic dissection in a patient with acute chest and back pain. The primary entry tear is located in the proximal descending aorta (black arrows), and the process extends retrograde to the ascending aorta, as well as to distal aortic segments. This case is an example of complete thrombosis of the ascending and arch segments of the aortic false lumen. There is no evidence of flow or contrast opacification within these zones (white arrows) compared with appearance of the descending segment of the aorta where obvious increased contrast attenuation is noted within the false lumen. The true lumen within the ascending aorta retains a relatively cylindrical contour. This appearance is frequently associated with a lack of false lumen flow and is indicative of clot molded by the hydrostatic forces in the patent true channel. This appearance is clearly different than the geometry of the true lumen in the descending segment where the true lumen is not circular, but ovoid, and changes shape between phases of the cardiac cycle as the contour of the aortic septum relative to the true lumen dynamically alternates between convex (systole) and concave (diastole). This observation is typically evident in an aortic dissection with a patent false lumen and “double barrel” aortic flow.

Figure 11. A series of axial computed tomography images located at the same level of the aortic arch in a patient with dissection documents a progressive increase in the trans-aortic diameter of the proximal descending segment over 30 days following the diagnosis of acute dissection. This early dilation of the aorta is a manifestation of disease progression that can complicate the clinical course following acute aortic dissection.

Figure 12. Axial computed tomography images from the level of the mid-aortic arch extending distal to the aortic root illustrate an aortic dissection in a patient with acute chest and back pain. The primary entry tear is located in the proximal descending aorta (black arrows), and the process extends retrograde to the ascending aorta, as well as to distal aortic segments. This case is an example of complete thrombosis of the ascending and arch segments of the aortic false lumen. There is no evidence of flow or contrast opacification within these zones (white arrows) compared with appearance of the descending segment of the aorta where obvious increased contrast attenuation is noted within the false lumen. The true lumen within the ascending aorta retains a relatively cylindrical contour. This appearance is frequently associated with a lack of false lumen flow and is indicative of clot molded by the hydrostatic forces in the patent true channel. This appearance is clearly different than the geometry of the true lumen in the descending segment where the true lumen is not circular, but ovoid, and changes shape between phases of the cardiac cycle as the contour of the aortic septum relative to the true lumen dynamically alternates between convex (systole) and concave (diastole). This observation is typically evident in an aortic dissection with a patent false lumen and “double barrel” aortic flow.
influences presentation, treatment, prognosis, and efficacy of treatment. Clearly, the distal extent of the dissection may influence presentation through complications affecting distal branch vessels or lower limb arterial supply. The distinction between the thoracic aorta and the abdominal aorta is defined by the diaphragm.

The DeBakey and Stanford systems pay more attention to the primary entry tear than the extent of the dissection, although the modified DeBakey classification does differentiate between dissections with limited (II and IIIa) and more extensive (I and IIIb) aortic involvement.9 With greater follow-up of patients with aortic dissection it has become apparent that, even after successful surgical intervention in the ascending aorta, there remains a significant incidence of distal false lumen expansion and formation of chronic dissecting aneurysm.28,29 The distal extent of the dissection and the patency of the false lumen influences the likelihood of late complications; it is therefore important that the total extent of aortic involvement is accurately defined.

With reference to endovascular therapy, the segmental extent of the dissection has been shown to influence response to treatment. Rodriguez et al.30 demonstrated that complete thoracic false lumen thrombosis occurred in 64% of patients with a DeBakey IIIa dissection compared with just 45% in patients with more extensive distal dissection (IIIb) following thoracic endograft placement.

5. Clinical complications related to dissection.
- C = complicated:
  - aortic valve involvement;
  - cardiac tamponade;
  - rupture (Figs. 4 and 5);
  - branch vessel malperfusion—symptomatic branch vessel involvement defined as anatomic and clinical manifestations of branch vessel

Figure 13. Multiplanar computed tomography images show partial thrombosis of the false lumen within the descending segment of the aorta in a patient with acute dissection. Clot is evident within the proximal portion of the false lumen, extending longitudinally from the left subclavian artery. The lack of contrast opacification or evidence of false lumen patency is focal and restricted to the most proximal aspect of this segment, well above the primary entry tear in the mid-descending aorta.

Figure 14. A series of axial computed tomography images from the level of the primary intimal tear in the mid/distal descending aortic segment (arrow) through the level of the celiac artery in a patient with chronic dissection illustrates partial thrombosis of the false lumen. The mural-based, partial circumferential distribution of clot does not fill the entire lumen in any subsegmental zone, but lines a portion of the false lumen within the descending segment.
A forty-year-old man presents to the emergency department with sudden onset of back pain radiating to chest. Severity is described as 8 on a scale of 10. The “squeezing” sensation is associated initially with shortness of breath, diaphoresis, and right leg discomfort. On physical examination there is a marked discrepancy in the femoral pulses with a weak right femoral pulse and no palpable pulses in the right foot. His past medical history is positive for hypertension, coronary artery disease with a prior myocardial infarction,
prior ascending aorta graft repair, and a family history of aortic disease. Laboratory evaluations are unremarkable. (a) Axial computed
tomography (CT) images at the level of the aortic arch. (b) Trans-aortic measurement at level of maximum aortic diameter. (c) Axial images
through levels of celiac, superior mesenteric, and renal arteries. (d) Axial scans from the level of the aortic bifurcation through the
bifurcation of the iliac arteries. (e) Frontal images from an abdominal aortogram centered over the pelvis and focused on the iliac arteries.
(f) Curved planar sagittal CT reformations of the thoracic aorta. (g) Shaded surface display of a CT angiography data set of the thoracic and
abdominal aorta. The salient observations include primary entry tear in proximal descending segment; largest aortic diameter at level of
proximal descending segment; dissection extends from arch to right iliac; anatomic branch vessel involvement with static “no re-entry”
extension into the right iliac artery; complete thrombosis of false lumen in the arch segment and partial thrombosis of proximal portion of
descending segment. The DISSECT classification for this case is as follows: duration = acute; intimal tear = descending; size (maximum
diameter) = 38.35 mm; segmental extent = arch to iliac; clinical complications = complicated (right iliac involvement and leg symptoms);
thrombosis = complete thrombosis of arch and partial thrombosis of descending.

Fig. 15. (continued).
Figure 16. (a–h) A 59-year-old man transferred from an outside hospital with suspected aortic aneurysm rupture. He had an 18-hour history of diffuse chest and back pain prior to seeking medical care. He is intubated at the time of physical examination. His lower extremity pulses are symmetric, but weak. His past medical history is remarkable for poorly controlled hypertension, hyperlipidemia, obesity, smoking, and non-insulin-dependent diabetes mellitus. His baseline laboratory evaluations are normal. (a) Series of frontal chest
radiographs obtained during a 21-hour interval after presentation to an emergency department and eventual transfer from another hospital. (b, c) Axial computed tomography (CT) images through the level of the aortic arch and location of primary entry tear (arrow). (d) Trans-aortic diameter measured at level of maximum aortic size. (e) Axial CT scans through the mid and distal descending aorta. (F, G) Series of sequential axial slices through the origins of the celiac, superior mesenteric, renal, and inferior mesenteric arteries, and at the level of the aortic bifurcation. (h) Curved planar CT reformation through the course of the superior mesenteric artery and frontal projection through the origins of the renal arteries. The notable imaging findings include primary entry tear in the proximal descending aorta (arrow); maximum aortic diameter at level of proximal descending segment; aortic false lumen extends from ascending to iliac arteries; obvious aortic rupture with mediastinal and pleural blood/hematoma; no imaging evidence of branch vessel compromise, and complete thrombosis of ascending segment false lumen. The DISSECT classification for this case is detailed as follows. Duration = acute; Intimal tear = descending; size = 42.40 mm; segmental extent = ascending to iliac; clinical complications = complicated (aortic rupture); thrombosis = complete thrombosis of ascending.
compromise (e.g., static and/or dynamic branch involvement with accompanying stroke, paraplegia, coronary, mesenteric, visceral, renal, and/or extremity symptoms) (Figs. 6–9);
  - progression of aortic involvement with proximal or distal extension of dissection (Fig. 10);
  - other—uncontrollable hypertension, uncontrollable clinical symptoms, or rapid false lumen dilation and/or overall trans-aortic enlargement of $>10$ mm within the first 2 weeks of initial diagnosis (Fig. 11).

- UC = uncomplicated (absence of complications listed above).

An accurate documentation of symptoms and complications is essential to describe the clinical condition associated with aortic dissection. Clearly, there is a plethora of life-threatening conditions that can be caused by aortic dissection. Frequently, these complications dictate the need for intervention. The simplest classification of clinical manifestations is to discriminate between complicated and uncomplicated aortic dissection.

The differentiation between complicated and uncomplicated dissection has significance with regard to prognosis in type B dissection. Estrera et al.\(^{31}\) reported the outcomes of 159 patients with type B dissection. Complicated dissection occurred in 47% of patients and was associated with a hospital mortality of 18%; this was compared with an uncomplicated dissection (53%, 85/159) mortality of 1.2%.

6. Thrombosis of aortic false lumen (evaluation of patency within the dissected aortic segments as imaged by computed tomography, magnetic resonance, ultrasound, or transesophageal echocardiography).

- P = patent aortic false lumen—evidence of flow or contrast opacification within the false lumen throughout the length of the dissected aorta.

Or

- CT = complete thrombosis of the aortic false lumen—no evidence of flow or contrast opacification within the following segments of the dissected aortic false lumen:
  - A = ascending aorta (Fig. 12);
  - Ar = aortic arch (Fig. 12);
  - D = descending (Figs. 13 and 14);
  - Ab = abdomen.

And

- PT = partial thrombosis of the aortic false lumen—longitudinal thrombosis of a portion of the aortic false lumen (Fig. 11) or circumferential thrombus that partially fills the false lumen (Fig. 12) constitute partial or incomplete thrombosis within the following segments of the dissected aorta:
  - A = ascending aorta;
  - Ar = aortic arch;

False lumen patency has prognostic significance following aortic dissection and should be reported in any classification system. Fattouch et al.\(^{29}\) demonstrated that a patent false lumen following surgical treatment for type A dissection was a predictor for late death and requirement for treatment on the descending aorta. Perhaps the most significant study illustrating the importance of false lumen thrombosis was reported by Tsai et al.,\(^{12}\) who studied patients with type B dissection and demonstrated that partial thrombosis of the false lumen was associated with increased mortality (relative risk: 2.79).

Figs. 15 and 16 are case examples that detail the application of the DISSECT classification system.

Since the first description of aortic dissection by Morgagni,\(^{1}\) those interested in cardiovascular diseases have struggled to understand what influences its occurrence, complications, and prognosis. Soon after the advent of open surgical treatment of patients with aortic dissection, the quest began in earnest to define those patients who benefit most from operative therapy and those that live longer when left non-operated. The first attempts to parse cases into subgroups for the purpose of defining factors that might determine patient outcomes involved the examination of the extent of aortic disease, including the precise anatomic segments involved, and its correlation with survival. It was clearly evident that all dissections did not behave the same in terms of prognosis, early rupture, extension, and surgical treatment.

Subsequently, continuing efforts to stratify dissection patients into subgroups of anatomic involvement based on the appropriateness of surgical treatment led to the development of pragmatic classification systems that have dictated clinical practice for more than 40 years.\(^{4,8}\) The use of such schemes in the endovascular era still provides sound guidance for cardiovascular specialists, but discounts consideration of other features of the disease that facilitate the evaluation of endovascular alternatives to medical therapy and surgery.

**CONCLUSIONS**

The mnemonic-based classification system detailed herein provides in a shorthand framework of all the anatomic features of interest to cardiovascular practitioners faced with making a therapeutic decision for a patient with aortic dissection. The addition of previously unaddressed elements, including the location of the primary intimal tear, clinical symptoms, and patency of proximal aortic false lumen, defines critical features that are important to understand when one considers placement of an endograft. After each of the six elements in the classification scheme are evaluated, the DISSECT mnemonic facilitates succinct communication of the fundamental clinical and anatomic features necessary to inform a successful management disposition to medical therapy, open surgical repair, or
endovascular management based on current knowledge of aortic dissection.

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CONFLICT OF INTEREST

None.

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