Aggressive surgical repair for ascending intramural hematoma is still a great option

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Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication Oct 9, 2015; accepted for publication Oct 18, 2015; available ahead of print Nov 19, 2015.

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J Thorac Cardiovasc Surg 2016;151:359-60

0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2015.10.039>

Pathophysiologic classification of aortic dissection.

Central Message

Excellent results can be achieved with aggressive treatment by either open or endovascular repair of intramural hematomas.

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Intramural hematoma (IMH) of the ascending aorta is a type of acute aortic syndrome. It has been suggested that IMH should be reconsidered as aortic dissection with thrombosis of the false lumen, because the indications and treatment for both are the same.¹ The pathophysiologic mechanisms of dissection and its variants such as IMH, have been classified into 5 types because the condition represents a heterogeneous population of patients (Figure 1).²

The reasons that either dissection or intramural hematoma occurs are likely numerous. Most often, the acute event that often brings us to the operating room is probably late manifestation of a chronic degenerative disease occurring within the vessel wall. How the disease process progresses and leads to the event of either full-blown dissection or the less obvious IMH is not well understood. In their article in this issue of the *Journal*, Matsushita and colleagues³ have demonstrated that among the population of patients presenting with ascending acute aortic syndrome, the 26% who had IMH were different from the rest, who were categorized as having more conventional dissection. The IMH group was older. This is not surprising in light of the various mechanisms responsible for IMH and its frequent association with atherosclerosis.² A more important difference was in how they presented. Patients with IMH were less likely to present with malperfusion or aortic regurgitation and more likely to present with tamponade. Patients with IMH were also less likely to undergo a more extensive operation such as total arch replacement.

Matsushita and colleagues³ adjusted for these differences by using a propensity matching technique that was based on 16 variables to compare those with IMH with those with conventional aortic dissection. By doing so, they demonstrated that similar early outcomes were achievable in both groups. It is also important to note that their outcomes were excellent, highlighting the importance of delivering surgical aortic care in a high-volume center of excellence.

What we do not know from this experience, however, is what happened to those patients who were not selected to

undergo intervention, and Matsushita and colleagues³ recognize this limitation in their discussion section. This is an especially important point when discussing the topic of IMH, because some controversy has arisen regarding the ideal treatment choice for these patients when they are otherwise considered high risk. In a review of the literature looking at ascending IMH in patients with a distal primary entry tear treated with descending thoracic endovascular aortic repair, the mortality was only 1.8%, and the survival at 24 months was 95%.⁴ The ascending aorta may also be treatable with thoracic endovascular aortic repair for selected patients who are not operative candidates.⁵ These reports demonstrating the feasibility of an alternative approach are also affected by the same limitation as that described previously.

As we all can appreciate, the definition of what constitutes high risk and who is not considered an operative candidate because of that perceived risk is a moving target that is based on local expertise and judgment. Matsushita and colleagues³ defined IMH according to imaging characteristics and purposely kept their definition broad because of issues with the accuracy of imaging intimal tears. As such, the percentage of patients categorized as having IMH seems a bit high at 26%. The pathophysiologic processes at work when someone presents with an acute aortic syndrome ideally would not be categorized in a dichotomous fashion, because it is more likely a continuous

FIGURE 1. Pathophysiologic classification of aortic dissection. *I*, Classic dissection with flap between true and false lumens; *II*, intramural hematoma; *III*, limited intimal tear with eccentric bulge; *IV*, penetrating atherosclerotic ulcer with surrounding hematoma; *V*, iatrogenic or traumatic dissection. Adapted from Svensson LG, Labib SB, Eisenhauer AC, Butterly JR. Intimal tear without hematoma: an important variant of aortic dissection that can elude current imaging techniques. *Circulation*. 1999;99:1331-6.

process that can present across a spectrum of disease according to other details, such as the size and location of the entry tears or ulcerations, severity of hypertension, aortic wall integrity, and a host of other biologic factors related to both cellular and extracellular function. Nonetheless, with current limitations of imaging and the need for timely decisions, the categorization used by Matsushita and colleagues³ is practical.

As our understanding of the various manifestations of these disease processes evolves, it is to be hoped that we will become better at choosing the best therapy tailored to each patient's specific presentation. In the meantime, Matsushita and colleagues³ have shown us that an aggressive approach to treating acute ascending intramural hematoma with surgical interposition grafting is safe and strongly recommended when there is evidence of tamponade, an ascending aorta of at least 4.5 cm, or a hematoma more than 7 mm thick. And most patients who

present with ascending IMH are considered operative candidates despite being older. Matsushita and colleagues³ also demonstrated that long-term survival was better in the IMH group than in the type I classic dissection group both before and after matching. This is a most important message that should not be lost among the various discussions surrounding novel therapies or the feasibility of medical therapy for the patients at highest risk.

Many of these patients will have the culprit lesion (entry tear or ulceration) occur more distally in the aorta, and the dissection thus extends retrograde into the ascending aorta. It is therefore not surprising to see that with a median follow-up of only about 4 years, 10% went on to have reintervention. With longer follow-up beyond the first decade, it is likely that this number will increase. In the IMH group, all these reoperations were performed on the distal aorta, with more than half involving the arch. This also raises the question of where a more extended arch repair with the hybrid frozen elephant trunk technique fits into the treatment decision for this disease. Most of the reoperations in the dissection group were distal, with only a smaller percentage requiring proximal reoperations. As with any patient with thoracic aortic disease, rigorous follow-up with early reintervention will become increasingly important for improving survival in this complex population of patients.

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