How To Pick Patients With Uncomplicated Acute Type B Aortic Dissection Who Are Best Treated By TEVAR?

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Introduction:
DeBakey type 3 or Stanford type B aortic dissection describes a dissection process that affects the descending thoracic aorta and has an incidence of 1.2–2 per 100,000 persons per year, with a historical mortality without treatment of 50 to 85%. Patients can be divided into two groups – those with symptoms and signs of malperfusion, leak or rapid expansion that are termed ‘complicated’ and those without any of these problems, the so-called ‘uncomplicated’ group. The case for intervention in the former group has already been made and the outcome from TEVAR is superior to open surgery.

Historical temporal classifications into acute (within 2 weeks of presentation) and chronic (from 2 weeks onwards) are now accepted as being less useful. What is clear though is that there is a period post dissection during which the dissection flap remains malleable and remodeling (either spontaneously or after TEVAR) is possible. Beyond a certain time period (uncertain, but increasingly frequent beyond 6 months), the flap becomes more rigid and the duality of flow within the true and false lumen becomes established.

In-hospital outcomes are generally acceptable in patients with uncomplicated type B aortic dissection, with up to 90% of patients surviving discharge after optimal medical therapy. However, patients treated with medical management alone are thought to have an increased risk of up to 25% of late complications, mainly aneurysm formation and to a lesser extent rupture and malperfusion. However, more recent data from IRAD suggests the risk of aortic expansion in the uncomplicated patient group may be much higher and up to 60% in some patients. Can these be predicted?

Evidence:
The success of TEVAR in the acute complicated setting has led some to consider whether its use in an uncomplicated setting could be justified. Beyond 2 weeks, the peri-operative complications rate is low and the remodeling rate is high, but it is uncertain if there is a justification in terms of long-term benefit. This has to be pitched against the known difficulties of treating late complications of type B dissection, predominantly aneurysmal dilatation, by which time simple TEVAR is inadequate and complete thoraco-abdominal aneurysmal exclusion is needed.

The ADSORB trial (acute uncomplicated type B dissection: BMT vs BMT and TEVAR) has shown significantly better remodeling at a year in the TEVAR group. 57% of patients in the TEVAR group developed complete false lumen thrombosis compared with just 3% without TEVAR (p<0.001) with an increase in true lumen diameter of 7.7mm for the stent group compared with only 1.7mm without (p<0.001).

The INSTEAD trial has focused on the more chronic group (14 days to 1 year) and randomized uncomplicated patients between BMT and TEVAR or a control BMT group. The initial power calculations were based on historical mortality figures and improvement in BMT meant a very low initial mortality in this group. This, combined
with the expected peri-operative complications of intervention made the early results favour BMT over TEVAR. Already at 2 years however, positive remodeling had occurred in 91.3% of the TEVAR group compared with only 19.4% in the BMT group alone. I would argue that this was predictable and the really important results would not become apparent until at least 5 years post randomization when the BMT group had had time to dilate (if they were going to) and any remodeling benefits of TEVAR had become evident.

**Risk groups:**
The above makes the case for treating most patients with TEVAR, but there is already some evidence that certain patients can be predicted to rapidly dilate and should be intervened on early to prevent this. The following have been found to be predictors of late aortic expansion (post type B dissection) – patients with connective tissue disorders, patent or partial thrombosis of the false lumen, rapid early expansion, small aortic diameter at presentation, large false lumen diameter (>22mm) and certain racial groups. This data is interesting but based on small numbers and that limited to particular racial groups may not be reliably extrapolated globally.

**Conclusion:**
Evidence to date points to an improved early survival benefit from rigorous conservative management of uncomplicated type B aortic dissection. However, there is a suggestion that longer term, this does not protect against chronic dilatation. Equally, there is evidence to suggest that TEVAR within a few weeks to one month of presentation can be performed with a relatively low complication rate and results in positive remodeling of the true/false lumen ratio. It remains uncertain whether this will reduce overall expansion in the longer term, but from experience of treating complicated type B aortic dissection in a similar time frame, I suspect it will. Looking at the present standard of evidence, it is unclear if it is robust enough to reliably predict a group (from a Western population) to select for early intervention. However, putting together the latest evidence on expansion (despite best medical treatment), remodeling following TEVAR and the known difficulties of treating late thoraco-abdominal aneurysms in a chronic setting, I believe that there will be a lower threshold for stenting uncomplicated type B aortic dissection in the future. However, there is not enough evidence to support this strategy at the moment.

**References:**


