Endovascular treatment for thoracic aortic dissection: the better solution?

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This editorial refers to 'Endovascular stent-graft placement in aortic dissection: a meta-analysis† by H. Eggebrecht et al., on page 489

The article of Eggebrecht et al.,† might provide an important insight into the actual discussion on the preferred treatment for descending thoracic aortic dissection (Stanford type B). Indeed, treatment of descending aortic dissection continues indeed to be a challenge. What we do know for sure is that open surgery, particularly when performed under emergency conditions, remains associated with considerable mortality and morbidity rates. On the other hand, the 'optimal' medical treatment—the treatment of choice in the overwhelming majority of patients—has also been recognized to result in a far from attractive long-term prognosis.3

Eggebrecht et al. present a meta-analysis on endovascular prosthetic treatment of Stanford type B dissection for the period 1999–2004. Based on 39 studies, including 609 patients, they demonstrate that the technical success of endovascular treatment is over 95% with a 30-day mortality rate of 5.3%. Major complications might be seen in one out of ten patients, but the incidence of neurological complications is quite low: peri-operative stroke occurs is less than 3% of the cases and the incidence of paraplegia is less than 1%. The mean follow-up period was 19.5 months and the authors report a 2-year survival rate of 89%. Apart from this, the authors suggest (1) that the results have improved over the years, (2) that high-volume centres perform much better than low-volume hospitals, and (3) that peri-operative results for chronic dissection exceed these of acute dissections.

Although this meta-analysis clearly brings out very important data, it also needs to be scrutinized and put into perspective. The series reported here is clearly a selected cohort and it remains unclear as to what percentage of patients are technically suited for endografting and what percentage are not. Although it is clearly stated that treatment in the acute phase is limited to complicated cases not amenable to medical treatment, the technical parameters for inclusion or exclusion are not delineated. The indications in chronic cases are also not defined. The same goes for the operative technique: is it sufficient to cover the entry tear? Is there any advantage in the use of additional bare stent to expand the true lumen in the thoracic aorta? What is the place of fenestration techniques?

These remarks do not, however, alter the fact that the early results of endoprosthetic treatment are quite encouraging. Although a substantial proportion of the procedures—especially in the acute group—must have been performed in emergency settings and while some 16% of the patients presented with evidence of aortic rupture, the technical success rate was well over 95%, with a procedure-related mortality rate of 2.3%. The authors have documented clear evidence of better results in recent papers vs. 'early' studies. The findings of superior results in high-volume hospitals represent an argument towards centralization of this type of pathology. The better results in chronic vs. acute cases might raise some concern about the optimal time period for treatment. At first sight this might be construed as an argument for postponing treatment a couple of weeks after the acute event. However, the truth is probably that most patients operated on in the acute phase did present with a life-threatening complication, which might also explain the relatively inferior results.

Technical success is a prerequisite for clinical success. These terms are however not synonymous and the evolution of the false lumen might be critical in this regard. Data are, unfortunately, relatively scarce and have been reported in less than 50% in the actual meta-analysis. Here it appears that thrombosis is seen in 75% of the cases. It might be presumed that this is particularly the case in acute but not in chronic dissection. Neither this nor the clinical significance is clarified in the present analysis. As there are indications that persistence of the false lumen will result in the long-term in an adverse outcome, the issue is of utmost importance.5 In addition, if—as with abdominal aortic aneurysm—complete thrombosis of the false lumen is considered as a major determinant for clinical success, this could lead to—maybe unjustified—scepticism with regard to endovascular treatment.

The first reports on endovascular treatment of Stanford type B aortic dissection date from only six or seven years ago.6,7 Therefore, it is no surprise that the mean follow-up in the meta-analysis is less than two years. The 2-year survival rate is 89%, but there remains a continuing risk of aortic rupture (approximately 2%). The conversion rate to open...
surgery seems to be quite acceptable but, in total, some 12% of the patients were in need of a secondary intervention, which necessitates lifelong surveillance. The need for lifelong surveillance and the high re-intervention rate are exactly the factors that have been recognized in randomized trials as the Achilles heel of endovascular treatment of abdominal aortic aneurysm. Although it is agreed that abdominal aortic aneurysm represents a completely different challenge, it also indicates that we need to learn more about the causes of long-term failure. The key questions here are whether these long-term failures are primarily disease-related or whether the majority can be eliminated by improvement in the stent-graft materials and the operative technique.

It might be clear from all this that the meta-analysis presented by Eggbrecht et al. solves some of the problems associated with thoracic aortic dissection. Indeed, it provides evidence that endovascular grafting in a selected cohort of patients can be performed with a high technical success rate and an acceptable morbidity and mortality rate. The authors should therefore be congratulated not only for this work but, in particular, for their continuing efforts. They have indeed been pioneers of these techniques. On the other hand, this review can certainly not be considered—as this is clearly stated by the authors—as a letter of safe-conduct to expand the actual indications for treatment. Medical treatment, consisting of individually tailored blood pressure control and beta-blockers, remains therefore the treatment of choice for the time being. Whether this will change in the future will depend in the first place on the outcome of more prospective, and preferably randomized, studies. Professor Nienaber, one of the co-authors of the meta-analysis, has already initiated such a randomized study. The INSTEAD (Investigation of STEnt grafts in patients with type B Aortic Dissection) study will look for 136 patients with uncomplicated type B aortic dissection in 11 clinical sites in four European Countries. The patients will be randomized to either endovascular treatment (Medtronic Thoracic Talent Stent Graft System) and antihypertensive therapy, called bstent grafting or an antihypertensive treatment called best medical treatment. After randomization, all the patients will be monitored for two years. Enrolment has already been completed some months ago and the first results should be available in 2006.

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References