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## Endovascular stent-graft placement

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Aortic dissection, endovascular stent, outcome

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## Comments

An important study which has laid the foundations for larger randomised controlled trials with longer follow-up periods. The place of endovascular stent-grafts in the management of uncomplicated and chronic type B dissections (traditionally receiving medical therapy alone) needs exploring. Questions regarding stent migration in the longer term and subsequent complications await further studies. Endovascular stent therapy, however, has the potential to avoid the need for an emergency thoracotomy and aortic clamping, with its associated risks, in already profoundly compromised patients, and to improve the gloomy prognosis for aortic dissection.

## Introduction

Acute aortic dissection has an appalling prognosis if left untreated with a one week mortality of 62-91%. For patients with Stanford type A dissections, the consensus of opinion is that immediate surgery is required to prevent the high mortality from myocardial infarction, tamponade or aortic regurgitation. Type B dissections, however, should receive medical treatments (antihypertensives and beta blockers), with surgery being reserved for complications. Quoted mortality figures for type B dissection treated medically and surgically are 20% and 29-35%, respectively. However, endovascular stent-graft procedures are being explored as an alternative less invasive therapy for aneurisms.

## Aims

To investigate the safety and efficacy of endovascular stent-grafts (placed over the primary aortic tear to close off the false aortic lumen) in the treatment of acute aortic dissection.

## Methods

Over a 2 year period (1996-1998), 19 patients admitted with acute aortic dissection at two institutions (one in the USA and the other in Japan), received stent-graft insertion. These patients were chosen because of co-existent complicating factors including end-organ ischemia as a result of aortic branch vessel obstruction, acute rupture, continuing back pain, and unusual position of the primary tear. Patients were excluded if the intimal tear was less than 1cm from the left subclavian artery. Four patients had a type A dissection and 15 had type B. Prior to stent-graft insertion, medical treatment was instituted as soon as the diagnosis was made. Follow-up included CT imaging at 72 h, 6 months and yearly thereafter. Stent-grafts were made of a self-expanding metallic framework covered with polytetrafluoroethylene or woven polyester.

## Results

Three patients (16%) died within 9 days of surgery, but no other deaths occurred during follow-up (mean 13 months). Morbidity included an infarcted bowel requiring total colectomy and partial small bowel resection, and distal limb ischemia needing above knee amputation in one of the patients, who ultimately died. Pneumonia occurred in another non-survivor, and one of the survivors required short term dialysis. Endovascular stents were successfully placed in all patients in the thoracic aorta true lumen across the intimal tear, and complete thrombosis of the false lumen was evident in 15 patients (79%). Angiography revealed relief of ischemia in 76% of obstructed aortic branch vessels following stent placement, with subsequent resolution of symptoms.

## Discussion

Acute aortic dissection requires definitive management when complicated by rupture, ischemia (as a result of branch vessel obstruction), cardiac complications due to dissection extension and aneurism development. Traditionally, type B dissection has initially been managed with medical treatment because of the high early surgical mortality. Early complications however, require intervention, and in the long term aneurism may develop if the false lumen remains patent following medical treatment alone. Consequently, alternative treatments have been explored and this study suggests that endovascular stents may play a role in the management of type B aortic dissection. Although 4 patients in this study with type A dissection were managed with endovascular stent-graft placement, the intimal tear was in the descending aorta and extended backwards into the ascending aorta.

## Additional information

An accompanying editorial also comments on another paper in the same issue of the journal which prospectively compared endovascular stent-graft placement with surgery in elective aortic dissection (type B) surgery. This paper by Nienaber et al similarly showed promising results.

## References

1. Dake MD, Kato N, Mitchell RS, Semba CP, Razavi MK, Shimono T, Hirano T, Takeda K, Yada I, Miller DC: Endovascular stent-graft placement for the treatment of acute aortic dissection. N Eng J Med. 1999, 340: 1546-1552.