SHORT REPORT

Treatment of Chronic Mesenteric Ischemia by Subintimal Angioplasty of an Occluded Superior Mesenteric Artery

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Introduction. Subintimal angioplasty is an established technique for the recanalisation of occluded vessels. It has been applied extensively to the peripheral arterial system but not the mesenteric vessels in mesenteric angina.

Report. We report the first described case of recanalisation of a mesenteric vessel. The vessel has remained patent for five years with good symptomatic relief.

Discussion. Subintimal angioplasty could represent an alternative treatment to major surgery for occlusive disease of the mesenteric vessels.

Keywords: Subintimal; Angioplasty; Mesenteric; Ischaemia.

Introduction

Subintimal angioplasty has been a well described technique for the recanalisation arterial occlusions for over eighteen years.1 Initially applied to femoro-popliteal segment occlusion its use has been extended to the crural vessels and the iliac arteries.2,3 Although there have been case reports of subintimal angioplasty being used in the recanalisation of occluded coronary arteries4 most of the applications of this technique remain restricted to the peripheral arterial tree. There have been no reported cases in the literature of the use of subintimal angioplasty in abdominal visceral vessels.

Case Report

We present our first case of chronic mesenteric ischaemia treated by this technique. The patient was 56 year old woman who suffered from multiple co-morbidities (atrial fibrilation, peripheral vascular disease, aortic aneurysm, subarachnoid haemorrhage, smoking, atheromatous and renovascular disease with hypertension).

The patient initially presented with acute ischaemic colitis with perforation and abscess formation. She underwent a laparotomy with bowel resection and defunctioning iliostomy. The postoperative course was complicated by sub-phrenic abscess and subsequent adhesions.

A year later she underwent a reversal of her iliostomy which was again followed by a stormy post-operative course. Duplex ultrasound demonstrated a 90% superior mesenteric artery (SMA) origin stenosis.

Six months later the patient then developed a poor appetite and post-prandial abdominal pain. Angioplasty was carried out to the SMA origin (coeliac and inferior mesenteric artery were occluded). This provided symptomatic relief until 2 years later she was re-admitted with bloody diarrhoea and abdominal pain.

An angiogram showed only a minor stenosis at the previously treated SMA origin but there was a 3–4 cm length occlusion in the SMA distal to this (Fig. 1a).

Procedure

A 5F Sidewinder 2 catheter (Terumo) was used to access the superior mesenteric artery. A loop was formed in the hydrophilic wire (Terumo) and it was used to cross the occlusion in the subintimal plane.
The wire then broke back into the lumen. After 3000 IU of intra-arterial heparin a 5 mm \( \times \) 4 cm balloon catheter (Smash- Boston Scientific) was inflated twice for 10 seconds. Good flow was achieved and the symptoms improved immediately (Fig. 1b,c).

An angiogram carried out at four years after the sub-intimal angioplasty shows vessel patency (see Fig. 2).

Five years later the patient was seen in clinic (for her peripheral vascular disease) and remained asymptomatic. Duplex ultrasound confirmed that SMA remained patent.

**Discussion**

Mesenteric ischaemia is a serious cause of morbidity and mortality. In the acute presentation patients may have abdominal pain, bloody diarrhoea or peritonitis. They may require laparotomy and bowel resection which carries a high mortality rate. Chronically it presents with post-prandial abdominal pain and severe weight loss or with symptoms related to bowel strictures from a previous acute episodes.

The aetiology of mesenteric ischaemia may be occlusive (atheromatous disease, embolus, thrombosis, dissecting aneurysm, fibromuscular hyperplasia, arteritis) or non-occlusive (shock bowel, venous thrombosis, bowel obstruction, radiation).

For chronic mesenteric ischaemia with abdominal angina the most common cause is atherosclerotic disease.

Other than medical treatment with the control of risk factors and the use of antiplatelets/anticoagulants the main therapeutic intervention is angioplasty for stenotic disease and surgery. However, for occlusive disease surgical bypass or endarterectomy are the only options if intervention is deemed necessary. Technical success rate is good with a 5 year patency of 92% This
group of patients often have multiple medical and cardiac co-morbidities and major surgery represents a significant risk of complications with an operative mortality of 5%. In the peripheral arterial system, subintimal angioplasty offers a less invasive alternative to surgery. Although the results of subintimal angioplasty in the peripheral arteries are variable it would be difficult to make comparisons with the visceral vessels as the technique may only be suitable in certain situations. However the alternative is major surgery and, as demonstrated in this case, subintimal recanalisation of mesenteric vessels can offer long term vessel patency with symptomatic relief even in the presence of multiple adverse co-existing risk factors for restenosis or occlusion.

References


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