Emergency surgical extraction of rota ablator from the stent in the left anterior descending artery

Habib Khan*, Kareem Salhiyyah and Sunil Ohri

Department of Cardiothoracic Surgery, University Hospital Southampton, Southampton, UK

* Corresponding author. Department of Cardiothoracic Surgery, University Hospital Southampton, Tremona Road, Southampton, Hampshire SO16 6YD, UK.
Tel: +44-23-8077222; e-mail: hkhan76@hotmail.com (H. Khan).

Received 7 September 2014; received in revised form 1 January 2015; accepted 6 January 2015

Abstract

Trapping of interventional devices used to treat in-stent restenosis is rarely reported in the literature. Among those is a trapped rota ablation wire causing longitudinal stent deformation, sometime requiring another stent deployment onto the collapse stent. A Rota ablator getting stuck into the stent is very rare, and a lethal complication. We report a case of 79-year-old gentleman who underwent rota ablation for in-stent restenosis. During the procedure, the rota ablator got stuck into the stent resulting in haemodynamic compromise. To our knowledge, this is the first case where a rota ablator got stuck into the stent requiring surgical intervention.

Keywords: Stent • Rota ablator • Ischaemic heart disease

INTRODUCTION

Percutaneous coronary interventions (PCIs) are useful in treating ischaemic heart disease even complex coronary lesion can sometime be treated with good results. One of the challenges of coronary stents is in-stent restenosis. These are dealt by either repeat angioplasty or coronary artery bypass grafting. We report a case of in-stent restenosis managed with rota ablation (RA), leading to a trapped rota ablator wire within the stent.

CASE REPORT

A 79-year-old gentleman with a history of hypertension, hypercholesterolaemia and ischaemic heart disease was admitted to our hospital. He had previous multiple stents to the left anterior descending (LAD) artery using a drug-eluting stent (DES) (Fig. 1A and B). He presented with recurrent angina. Repeat angiography showed proximal in-stent stenosis. There was moderate disease in the first obtuse marginal. Attempted balloon angioplasty was not successful due to heavy calcification, and therefore he underwent an elective RA procedure. The procedure was done in a district hospital without surgical backup. Upon trying to go through the stent, the rota ablator got stuck inside the stent, and despite multiple attempts to withdraw the rota ablator, it was not possible to retract it (Fig. 1C and D). The patient developed severe chest pain, with ischaemic ECG changes and haemodynamic instability. He was resuscitated and an intra-aortic balloon pump (IABP) was inserted. The patient was transferred to our tertiary centre for emergency surgery.

Patient was taken immediately to theatre 4–5 h after the initial procedure. A medium sternotomy was performed. There was significant biventricular dysfunction. Cardiopulmonary bypass was established and heart was arrested using antegrade cold blood cardioplegia. Initially, two coronary bypass grafts were performed using a long saphenous vein to the LAD and the obtuse marginal1. The aorta was opened and the rota ablator wire was seen going through the left coronary ostium. The wire was cut and pulled. The rota ablator and stent came out. This resulted in endothelial damage to the left main stem (Fig. 1E and F). This was repaired using a simple interrupted 6/0 Prolene in a circumferential fashion. Owing to the left main stem injury, a further graft to the obtuse marginal2 was performed. Patient was weaned of cardiopulmonary bypass on IABP and high dose of inotropic support. Unfortunately, the patient died after 3 days due to multiorgan failure.

DISCUSSION

Before stents were introduced, percutaneous coronary angioplasty was the standard treatment, and provided an alternative to open heart surgery. The introduction of stents and adjunctive anti-thrombotic drug therapy resulted in a rapid increase in the number of PCIs yielding in better outcome. Complications of stenting include thrombosis, in-stent restenosis, coronary and aortic dissection [1]. Sometimes, the lesion in the coronary arteries is so challenging due to severe atherosclerotic disease that it
cannot be crossed by a balloon or cannot be adequately dilated even with a non-compliant balloon; such lesions may be better treated by RA, which is carried out by operators experienced in rotational atherectomy. RA followed by DES implantation in severely calcified coronary lesions appears to be feasible including a high rate of procedural success [2].

A recently described complication called longitudinal stent deformation, where the stent gets distorted or shortened in a longitudinal axis after successful stent deployment. It is a rare complication with incidence of ≈0.2% [3]. Modern stents have thin struts, and are designed to be flexible and easily deliverable.

However, with this property they lack the strength and are more prone to deformation during mechanical manipulation by interventional devices. De Caterina et al. [4] report a similar case where stent compression occurred while withdrawing the ‘buddy wire’, which was managed by crushing the retracted struts using another stent. A rota guide wire has got wider tip than body and is more prone to get trapped by the stent. If left alone, it can lead to stent thrombosis. Recommended treatment includes new stent insertion inside the collapsed stent [5]. In our case, the rota ablator was trapped inside the stent and despite multiple attempts, it was impossible to take the rota ablator out or deploy a new stent.

Our case highlights the importance of avoiding this complication completely or performing this procedure in a centre with cardiac surgeons on standby. This would avoid any unnecessary delay to transfer the patient from the catheter laboratory to cardiac theatre.

Figure 1: (A) The diseased LAD (white arrow), (B) stents in LAD (white arrow), (C) the rota ablator in the LAD (white arrow), (D) no flow beyond the rota ablator (white arrow), (E) the length of rota ablator and (F) the rota ablator stuck in the stent. LAD: left anterior descending artery.
increasing patient’s chance of survival. This was not the case in our patient as the procedure was performed at a local district hospital, and required time to transfer the patient to our centre. Surgically, the options include to leave the wire alone. Pull the wire out as we did in this case leading to the dissection of the coronary ostium, requiring repair with 6/0 Prolene circumferentially. Lastly, de-roofing, the coronary artery and then patching the coronary artery with vein graft. By doing this, we could have avoided the dissection of coronary ostium. To our knowledge, this is the first case where rotablator itself was stuck so badly that surgical intervention was required, leading to fatal complications.

Conflict of interest: none declared.

REFERENCES