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Use of a Fogarty Embolectomy Catheter to Retrieve a Foreign Body during Redo Coronary Artery Bypass Surgery: Case Report

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ABSTRACT

We report the successful use of an embolectomy catheter to retrieve a metal bullet tip of a cardiotomy suction device that was lost during redo coronary artery surgery. The metal tip was lost somewhere in the vicinity of a tear created in the ascending aorta during repeat sternotomy. Initial attempts at retrieval using a Foley catheter were made but were unsuccessful. The foreign body was successfully retrieved by withdrawing an inflated Fogarty balloon embolectomy catheter. The patient went on to have coronary artery bypass grafting and made a sound recovery from the operation.

INTRODUCTION

Intraoperative foreign body embolization is a potentially dangerous complication in cardiac and vascular surgical procedures. There are several reports of foreign body embolization with potentially serious consequences during cardiac surgery. To date there are no published reports on embolization of the bullet tip of a cardiotomy suction device and the use of a Fogarty balloon embolectomy catheter to retrieve it. We discuss the importance of being aware of this complication, and the importance of a treatment strategy for localization and retrieval of foreign bodies in cardiac surgery.

CASE REPORT

A 61-year-old man was admitted for redo coronary artery bypass grafting. Median sternotomy was performed using an oscillating saw. The ascending aorta and previous aortic cannulation site were densely adherent to the posterior surface of the sternum. During the dissection, an aortic tear occurred at the old cannulation site. Digital pressure was applied to control the bleeding. Femoro-femoral cardiopulmonary bypass (CPB) was instituted expeditiously and the patient's body temperature was cooled to 18°C. In order to control the bleeding around the aorta and to allow adequate visualization, a cardiotomy suction with a metal bullet tip was used. On removal of this suction device from the site of the aortic tear, the metallic bullet tip was observed to be missing. Meanwhile, deep hypothermic circulatory arrest was achieved. To retrieve the metal suction tip, a 12F Foley catheter (Bard, Crawley, UK) was inserted into the distal aorta through the tear and pushed distally into the aortic lumen. The catheter was pulled back following inflation of the balloon. Despite 3 such attempts, the missing suction tip could not be retrieved. Thereafter a 6F Fogarty embolectomy catheter (Edwards Lifesciences, Irvine, CA, USA) was used in a similar manner, and the missing metallic tip was successfully extracted. Following retrieval of the object, the aortic tear was repaired and CPB was reinstituted. The remainder of the operation proceeded in an uneventful manner. The patient made a good recovery and was discharged home after 10 days.

DISCUSSION

Foreign body embolization during cardiac and vascular surgical procedures may be device related. Embolization can be caused by components of mechanical valves [Kornberg 1999, Sudo 2000] and disconnection of the metallic tip of an aortic cannula during CPB [Scheld 1985]. Balloon migration during intraaortic balloon use has also been reported [Santini 1997]. A case in which a broken sternal wire migrated into the ascending aorta is documented [Hazelrigg 1994]. There is also a report of external trauma leading to a retained intracardiac foreign body [Massad 2002].

Other examples of embolization of foreign bodies during cardiac surgery do exist. In one of the author's experience a similar metallic suction tip of bullet type was lost in the circulation during the repair of an atrial-septal defect in an adult female patient. In this case the foreign body was noted only after termination of CPB. The tip was localized using on-table x-rays and was found to be in the right common femoral artery. The object was extracted by an open surgical technique. We have also experienced the embolization of a holder of a mechanical valved conduit during aortic root replacement. This object was found in the left ventricle. It was removed by pulling it out across the mitral valve through an opening in the left atrium.

A search of the literature showed no published reports on embolization of the bullet tip of a cardiotomy suction device and the use of such a technique to retrieve it. In our case it

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seems most likely that the bullet tip was lost in one of the neck vessels. The problem could have been different if this metallic tip had been lying in one of the peripheral vessels. In such cases localization of the foreign body using various imaging techniques and retrieval under direct vision may become necessary.

A foreign body of the size and shape of a metallic suction bullet could cause serious complications. These include obstruction of heart valves or coronary arteries or indeed any other major artery. These obstructions can lead to irreversible ischemic changes in the vital organs. Aortoesophageal fistula is also a recognized complication of retained foreign bodies [Wu 1992]. Therefore surgeons should be aware of the possibility of such an event occurring. The operating team must check all devices to be used in the heart and great vessels. It may also be advisable to use one-piece plastic devices without any joints or connections.

A careful treatment plan should be applied to such cases. Following unsuccessful attempts at retrieval, a local exploration of the vessel or the cardiac chamber should be considered. Clinical circumstances and x-ray image intensification can be used to locate radioopaque foreign bodies. On-table angiography should be used only as a last resort.

It is likely in the present case that the metal tip was lying in one of the neck vessels and hence could not be retrieved using the Foley catheter, which went into only the aortic lumen.

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