Surgical removal of fractured guidewire with ministernotomy

Kırılmış kılavuz telin ministernotomi ile cerrahi olarak çıkarılması

Ergun Demirsoy, Hakan Alp Bodur, Harun Arbatlı, Naci Yağan, Oğuz Yılmaz*
*Faruk Tükenmez, Servet Öztürk**, Bingür Sönmez*

Department of Cardiovascular Surgery, *Intensive Care Unit and **Department of Cardiology, İstanbul Memorial Hospital, İstanbul, Turkey

Introduction

Since 1985 many authors have reported complications of percutaneous transluminal angioplasty (PTCA) (1-12). Myocardial infarction is the major complication (6, 7), but we believe that guidewire fractures are also not so rare and such cases are underreported. Cardiologists developed percutaneous intravascular methods to extract the broken portion of the guidewire by special catheters but these may not always permit a successful salvage operation. Although it is believed that wire in the coronary artery may cause intravascular thrombus formation (4) or coronary narrowing (10), some authors preferred to let the wire stay in place (10) and followed-up with no ischemic events, while others removed it by urgent or elective surgery (2, 4, 6, 8, 9).

Case Report

A 45- year- old man with a history of stable angina pectoris was hospitalized in our cardiology ward for evaluation and treatment. Angiography showed total occlusion of the right coronary artery (RCA) at mid-portion, 70% stenosis in the first obtuse marginal artery (OM1) and OM3 with a normal left anterior descending artery (LAD). The patient was scheduled for PTCA.

The first attempt of intervention was on the RCA with success and a stent (NIR", Medinol Ltd., Jerusalem, Israel) was installed after balloon dilatation. The next procedure on the lesion in OM1 with placement of another stent in the ostium of the vessel was also successful. After the last PTCA procedure in the lesion in OM3, the guidewire (Cougar XT', Radius Medical, Maynard, MA, USA) was trapped between the stent and the vessel wall in OM1, and did not come out after insistent tractions and finally broke.

The broken part of the guidewire was attached to the stent in OM1 and the proximal end was pointing out in the ascending aorta (Fig. 1). After unsuccessful rescue trials with a snare loop (Amplatz "Goose Neck", Microvane Corp, White Bear Lake, MN, USA), urgent surgical removal was decided. The patient was informed and transported to the operating room.

A six -centimeter sternotomy extending from the manubrium to the 4th intercostal space was performed. Upon installation of cardiopulmonary bypass (CPB) by direct aortic and femoral venous cannulation with bicaval Carpentier venous cannula, (DLP, Grand Rapids, MI, USA) cardiac arrest was induced with antegrade blood cardioplegia. Carbondioxide gas was blown over the operative field to minimize air entry into the heart. A small transverse incision was performed on the ascending aorta. The proximal part of the guidewire was pointing-out from the left main coronary artery and was pulled-out easily with a clamp. After closure of the aorta, the heart was deaired through the aortic root cannula and the patient was weaned off CPB and the chest was closed in the usual manner.

The postoperative period was uneventful. A control angiography was performed on the 4th postoperative day. All treated vessels were optimally perfused but a tiny piece of the fractured guidewire was stuck between the stent and the vessel wall in the OM1 (Fig. 2). We decided to act conservatively as no irregularity of the coronary artery was observed.

The patient was discharged on the 5th postoperative day with clopidogrel bisulfate treatment. He is followed-up for 18 months, is angina-free and non-invasive stress tests are negative.

Discussion

As in each invasive procedure, PTCA has its own tribute of complications. Fortunately these are limited and not greater than 7% (6, 7). Severe complications requiring surgery stand below 1%. Guidewire fractures are not only extremely rare complications but infrequently require surgical measures sin-

Address for Correspondence: Ergun Demirsoy, MD, Necip Bey Sok. Melen Apt. 6/6, 81010, Acıbadem-Istanbul , Turkey
Tel/Fax: (+90) 212 220 8910, E-mail: ergundemirsoy@hotmail.com

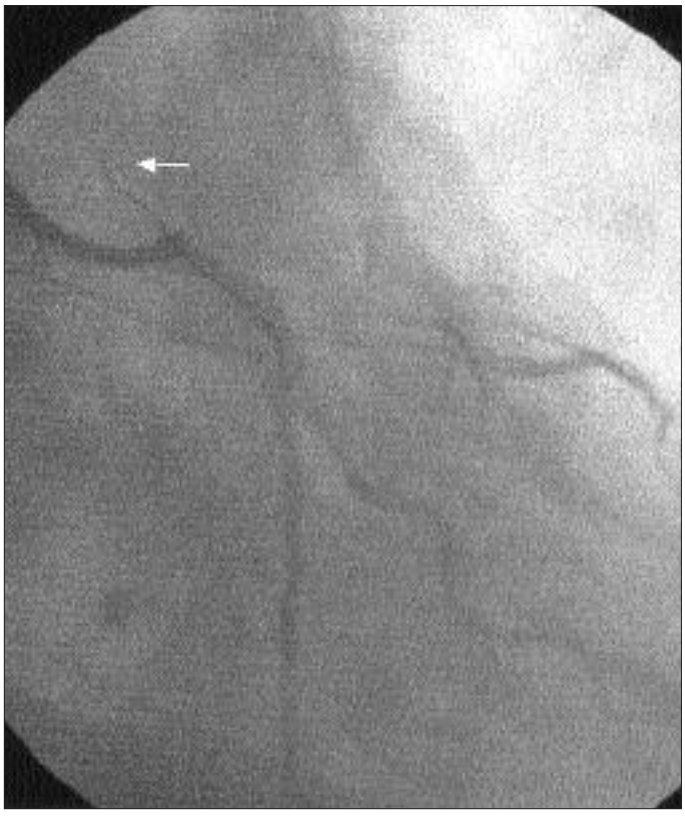

Figure 1. The proximal tip of the fractured guidewire (arrow) is protruding into the ascending aorta through the left coronary artery ostium

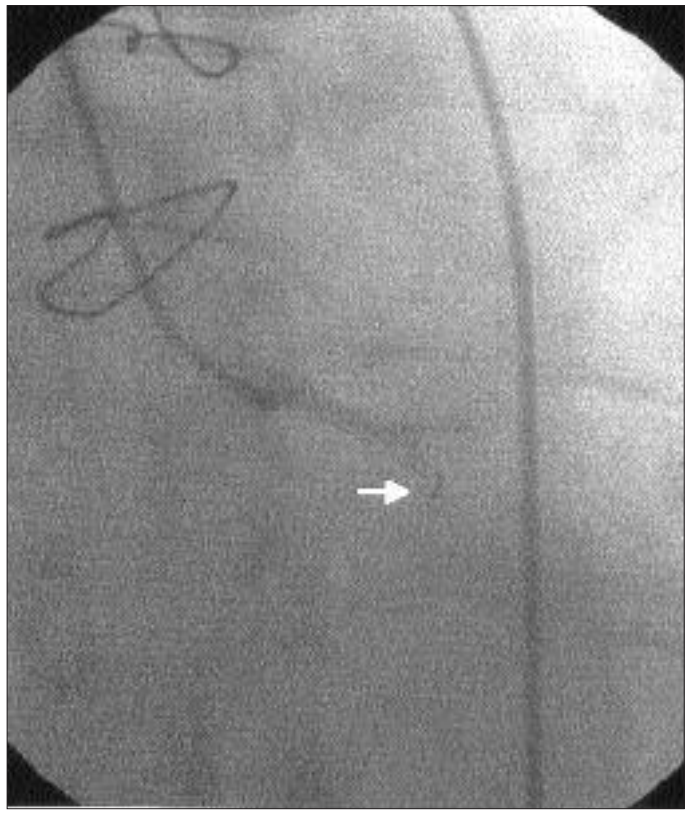

Figure 2. A tiny piece of the fractured guidewire (arrow) is stuck between the stent and the vessel wall in the OM1 as seen in the control coronary angiography

ce percutaneous maneuvers often suffice to withdraw the broken part from the patient's coronary artery or from his aorta.

Although, acute vessel occlusion or vessel spasms are described, elective surgery or even conservative therapy and observation are the most preferred approaches (6). It is also evident that each case should be approached as unique and the risks should be evaluated regarding the location of the fractured piece and the condition of the patient.

Percutaneous transluminal coronary angioplasty is an effective procedure and certainly has prevented surgical treatment for many patients. It is also an alternative for patients refusing surgery for psychological or even for cosmetic concerns. Explaining these to patients and moreover convincing them to undergo surgery is not always easy even if they were aware of such a possibility before PTCA.

There have been several reports about the surgical removal of a fractured guidewire fragment from the coronary arteries, but all through a conventional full-length median sternotomy (6,13,14). This is probably the first report with a ministernotomy approach.

In such rare complications of percutaneous procedures, surgery may be inevitable, and if so, mini-sternotomy would be the most preferable method. This is less invasive, more cosmetic and more easily tolerated by patients who are not psychologically prepared for surgery.

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