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Acute coronary syndrome due to bare metal stent fracture in the right coronary artery

Ostry zespół wieńcowy spowodowany złamaniem stentu metalowego implantowanego do prawej tętnicy wieńcowej

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Abstract

Stent fracture (SF) has been suggested to be an unusual cause of restenosis after drug eluting-stent implantation. However, angiographically visible SF after bare metal stent (BMS) implantation is extremely rare. We present a case of a 58 year-old male patient who presented with unstable angina secondary to a SF of a BMS within two months of elective percutaneous coronary intervention for right coronary artery associated with a muscle bridge and atherosclerotic stenosis.

Key words: coronary artery, stent fracture, coronary angiography

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INTRODUCTION

While arterial stent fracture is regularly seen in peripheral arteries (femoropoplietal), it is rare in coronary stents, and especially drug-eluting stents (DES). Stent fractures are responsible for 3.3% of in-stent narrowing [1]. We present the case of a patient who was implanted with an elective stent in the right coronary artery and who developed an acute coronary syndrome and had stent narrowing due to the fracture of the stent.

CASE REPORT

A 58 year-old male presented to our department complaining of effort-related chest pain of six months' duration. Since the complaints of the patient with a positive result of exercise test had increased during recent days in spite of medical therapy, coronary angiography was performed. In the middle segment of right coronary artery serious narrowness was observed (Fig. 1A). Thereafter, a bare metal stent (BMS) of 3.5 mm diameter and 15 mm length (Ephesos 2) was successfully implanted to this lesion (Figs. 1B, C). After two months, the patient re-presented to our department with a recurrence of the chest pain. Coronary angiography was performed (Figs. 2A, B). On the image obtained before the delivery of opalescent substance, it was seen that the stent was folded into two at the middle and formed an angle of 90 degrees (Fig. 2C). In the segment where this serious narrowing was observed, a BMS of 3.5 mm diameter and 18 mm length was directly implanted (Fig. 2D). The patient was stable on medical therapy and was discharged. A one-month follow-up was uneventful.

DISCUSSION

In-stent narrowing may reduce the clinical success of BMS [2]. If the stent structure is thinner, arterial damage is reduced [3]. However, as the stent structure thickness is redu-

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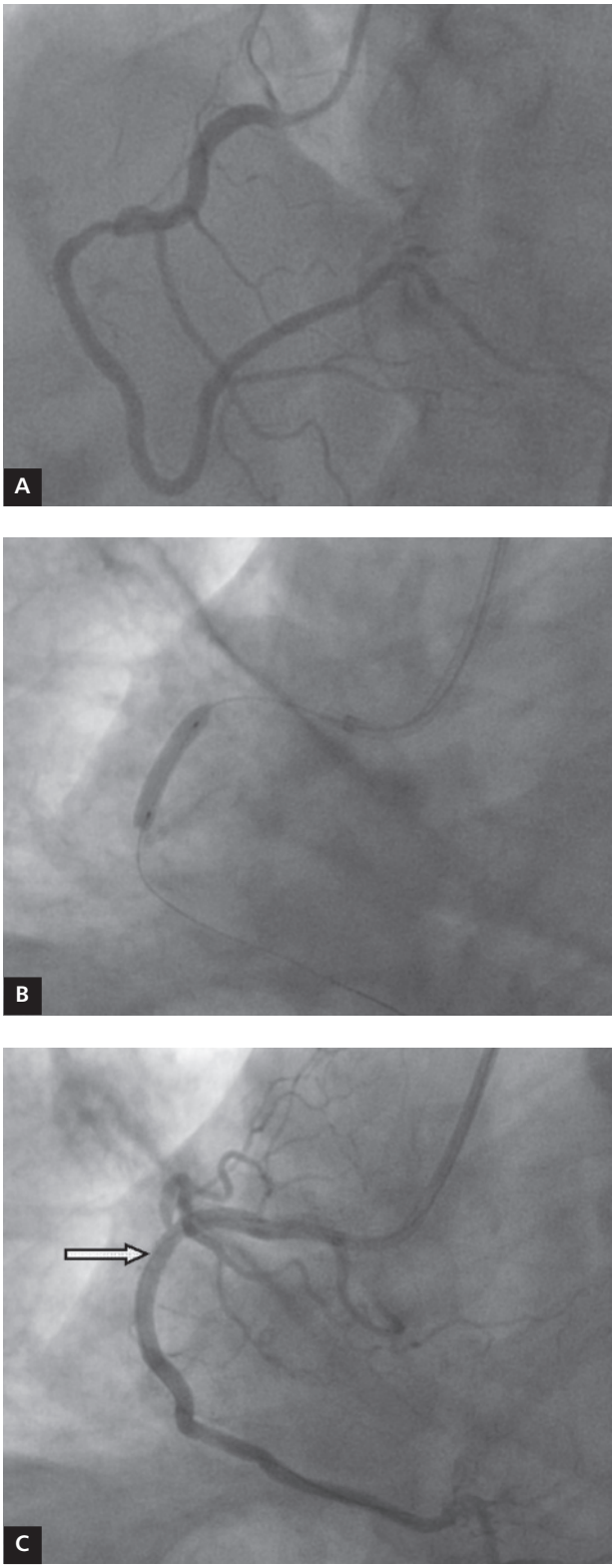

Figure 1. **A.** An atherosclerotic narrowing leading to a serious narrowness in the middle of the right coronary artery can be seen; **B.** Coronary stent intervention in the first lesion and the time of lesion opening can be seen; **C.** After the stent intervention to the first lesion in the middle of the right coronary artery (arrow), the lesion is completely opened and there is no residual narrowness

ced, high stresses on the body of the stent and on the vessel wall may lead to stent fracture [4]. In recent years, an increasing number of coronary stent fractures have been reported with DES compared to BMS, and these fractures may account for coronary stent restenosis [5].

A recent study categorised stent fractures into four types: type 1, one fracture on the stent body; type 2, uncompleted transverse fracture; type 3, complete transverse fracture without dissociation; type 4, dissociative transverse fracture [6]. The mechanical structure of coronary metal stents not only resists against the elastic withdrawal force of the wall of the vessel in which they are implanted, but also resists against the mechanical stress resulting from the vessel motion occurring during the millions of heart beats. In the literature, some cases of stent fractures resulting from excessive motion of heart vessels (for coronary artery, angulation and bending in systole and straightening in diastole) have been reported [7]. While percutaneous transluminal coronary angioplasty in the narrowing site is preferred for the treatment of stent narrowing in neointimal hyperplasia, percutaneous transluminal coronary angioplasty is insufficient for stent narrowing and obstruction resulting from stent fractures. This means that a reimplantation of another stent in the old stent will provide a better mechanical stabilisation in the fractured stent extremities.

Among the causes of coronary stent narrowing and obstruction, taking into consideration coronary stent fracture other than neointimal hyperplasia, is important for therapy and long-term results.

Conflict of interest: *none declared*

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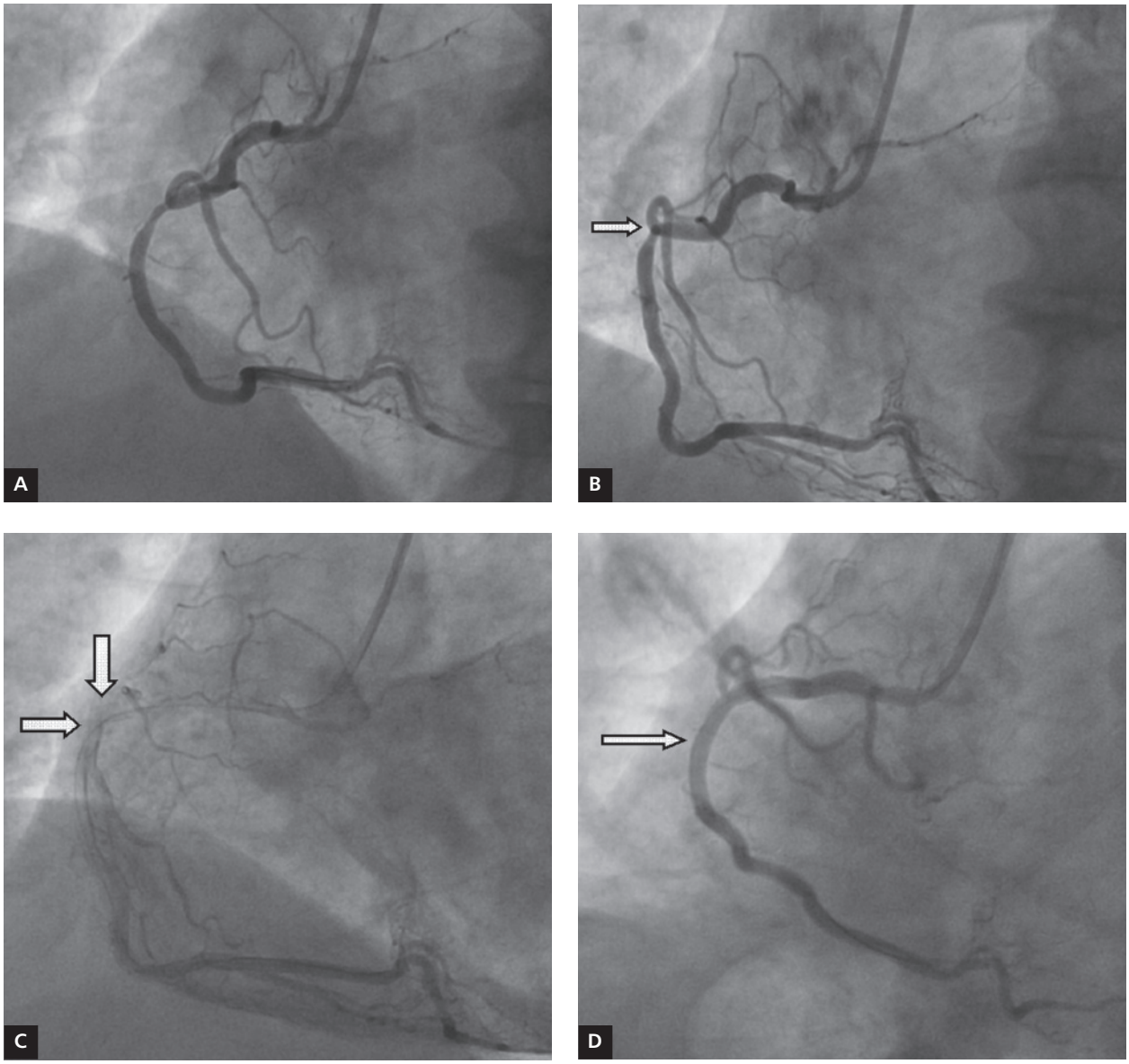

Figure 2. A. Two months later, a stent restenosis can be seen in the middle of the right coronary artery; **B.** In the angulated lesion with coronary artery muscle band (muscular bridge) in the middle of the right coronary artery, a coronary stent fracture (arrow) can be seen; **C.** In the coronary artery, at the time when the opalescent substance leaves and only the coronary stent is observed, it can be seen that the coronary stent in the middle of the right coronary artery (arrows) was at a 90 degree angle and was fractured; **D.** In the middle of the right coronary artery, following the re-implantation of a direct stent in the site where a stent restenosis had occurred after a stent fracture (arrow), it can be seen that the right coronary artery is completely opened