

Dislodgement of coronary stent due to rupture of stent balloon

Stent balonunun rüptürüne bağlı gelişen koroner stentin yerinden oynaması

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Summary– Rare stent complications, including dislodgement of stent, unexpanded stent, stent fracture and stent loss etc. can occur during percutaneous coronary interventions (PCI). We present a semi-expanded and dislodged stent due to rupture of stent balloon during primary PCI in this case report. An interventional cardiologist should be aware of the possibility of rare complications, such as in this case, and have enough experience and knowledge to handle them.

Özet– Stentin yerinden oynaması, açılmaması, kırılması ve kaybolması gibi nadir komplikasyonlar koroner girişimler sırasında meydana gelebilir. Burada primer koroner girişim sırasında stent içindeki balonunun yırtılması nedeniyle yarım açılan ve yerinden oynayan stenti sunduk. Girişimsel bir kardiyolog bizim olgumuza benzer nadir komplikasyonlar için uyanık olmalı ve onlarla başedebilecek tecrübeye ve bilgiye sahip olmalıdır.

Dislodgement of an unexpanded coronary stent is a rare complication of percutaneous coronary intervention (PCI), and is related to serious events including peripheral and cerebrovascular embolism, myocardial infarction, and even death.^[1-4]

We present this complication in a semi-expanded stent due to rupture of stent balloon and dislodgement of the stent in primary PCI.

CASE REPORT

A 33-year-old male patient was admitted with chest pain to our emergency room. The diagnosis was acute inferior myocardial infarction and the patient was transferred to the catheter laboratory for primary PCI. On the initial angiogram, the right coronary artery (RCA) was totally occluded with thrombus (Video 1*). After the guidewire crossed over the total lesion, a 1.5x20 Invatec® PTCA balloon was inflated at 10 atm. Following deflation of the balloon, TIMI 2 flow was achieved in RCA (Video 2*). We decided to implant a 2.5x25 mm. Simchrome® stent on the thrombotic lesion. The stent was inflated with 12 atm. pressure on the lesion for placement, but the distal part of the stent failed to expand (Video 3*). Efforts to expand

the balloon failed and dye leakage was observed at the distal part of the

balloon. The stent balloon was drawn back to be exchanged with a new balloon, but during retrieval the stent moved to a proximal portion of RCA, and TIMI Grade 0 flow with accompanying chest pain developed (Video 4*). The balloon removed from catheter was perforated (Figure 1). A chronic total occlusion balloon (1.25x20 mm) Blue Medical® was placed in the unexpanded part of the stent and inflated at 20 atm. pressure. After adequate opening of the distal part, TIMI 3 flow was achieved and patient's chest pain was relieved (Video 5*). A Xience Pro® stent (2.5x25 mm) covering the distal part of the stent and dissected thrombotic lesion was implanted in the mid segment of RCA (Video 6*).

Abbreviations:

PCI Percutaneous coronary intervention
RCA Right coronary artery

DISCUSSION

Rare complications such as dislodgement of stent, unexpanded stent, stent fracture, stent loss and stent deformity may occur during PCI.^[1,3,5] These events may result in myocardial infarction, stroke and death.^[1-4,6] We experienced a quite rare complication of coro-

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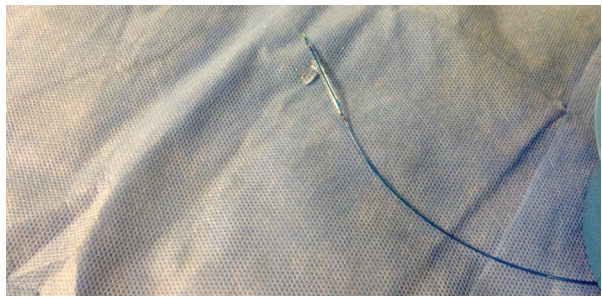


Figure 1. Perforated stent balloon.

nary interventions during primary PCI and managed it properly. There are many case reports on dislodged and unexpanded stents in the literature. However, a report presenting management of the dislodgement of a semi-expanded stent is rare because this is an unusual complication in new generation stents, and a reasonable explanation may be rupture of the stent balloon during inflation. If the stent balloon had been torn prior to stent placement, the stent would not have partially expanded. The rupture might have been due to calcific lesions, or a manufacturing defect in the balloon.

Another possible cause may be damage done by the operator to the stent struts during insertion into the guidewire or placement into the guiding catheter. During inflation, deformed struts may puncture the stent balloon. In the era of first-generation stents, they were crimped on the balloon by the operator, so the possibility of complications like our case were more likely to develop. However, the complication should be kept in mind, and the operator should exercise care while preparing and placing the stent into the catheter.

Due to a ruptured stent balloon causing non-expansion of the stent, a coronary artery may occlude totally and myocardial infarction may occur unexpectedly, even in the setting of an elective PCI. In this case, the operator should deflate the balloon many times to ensure complete deflation, and thus minimize risk during stent retrieval. Once the unexpanded stent has been expanded with a new balloon, the final decision whether to proceed with a new stent or to end the procedure should be made depending on coronary flow and position of the stent.

Large-volume centre experiences and a meta-analysis show a low incidence rate for complications like our case: In the PCI series the figures are: Stent loss 0.32%-1.3%, deployment failure 3.3%, disengagement from the balloon 0.34%, and peripheral embolization

0.3%. In addition, short and long outcomes are favourable, except in the case of stent loss, which is linked to high complication rates such as coronary artery bypass graft surgery, myocardial infarction and death.^[1,6,7]

Percutaneous coronary intervention is an operation that depends on both operator skills and quality of materials such as like catheters, guidewires, balloons, stents etc used in the procedure. Therefore, the operator should be aware of material-related complications during PCI and develop the skills to handle it.

Simultaneous dislodgement and semi-expansion of a stent in the same case is very rare in the literature. Rare complications such as is presented here may occur in PCI. The operator should keep these complications in mind and know how to handle them.

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***Supplementary video files associated with this article can be found in the online version of the journal.**

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Key words: Angioplasty, balloon, coronary/adverse effects; coronary vessels/injuries; heart injuries/etiology; rupture; stents.

Anahtar sözcükler: Anjiyoplasti, balon, koroner/yan etki; koroner damarlar/yaralanma; kalp yaralanmaları/etyoloji; yırtılma; stent.