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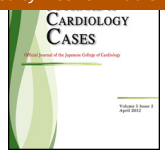

Case Report

Coronary stent embolization to the left ventricle and its management

Nizamettin Selçuk Yelgeç (MD)*, Adil Hakan Öcek (MD), Alparslan Kurtul (MD), Sani Namık Murat (PhD)

Department of Cardiology, Ankara Education and Research Hospital, Altındağ, Ankara 06340, Turkey

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ABSTRACT

We present a rare case of coronary stent embolization to the left ventricle during percutaneous coronary intervention. Fortunately we retrieved it successfully by a snare loop catheter. The approach to stents that move to the left ventricle is not clear. We may observe them conservatively without any intervention. We may also attempt to retrieve them having accepted the risk of systemic stent embolization while trying to catch it. To decide which approach is better we need more experience.

<**Learning objective:** This manuscript will help the reader to have some idea about how to approach the stents embolized to the left ventricle. We present a review of literature in the manuscript. This will hopefully help the reader to see the results of previous approaches to the stents embolized to the left ventricle>.

Introdution

A sixty-year-old woman presented to the emergency department with chest pain of two hours' duration. Electrocardiography showed ST segment elevation in inferior leads. Immediate left coronary catheterization showed unusually ectatic coronary arteries and slow flow. Right coronary catheterization demonstrated total occlusion of right coronary artery after conus branch with heavy thrombus burden. After wire crossing of the total obstruction, we did aspiration thrombectomy. We predilated the total obstruction by 3.5 × 20 mm balloon (Invader PTCA balloon catheter, Alvimedica, Çatalca, Turkey) multiple times at multiple levels. After some flow appeared in the right coronary artery and the distal part and the extent of the atheromatous plaque became visible, we attempted to implant a stent of 4.5 × 28 mm size (Eucatech cc flex balloon expandable coronary cobalt–chromium stent system, Rheinfelden, Germany). When attempting to cross the lesion with the stent, the complete guiding catheter system dislodged into the ascending aorta (Fig. 1), and while trying to retract the stent back into the guiding catheter (Medtronic Launcher 8F, JR-4, Minneapolis, MN, USA), the stent slipped from the balloon and embolized unintentionally into the left ventricle (Fig. 2). The fluoroscopy revealed the location of the stent under the posterior mitral valve and it appeared stable there. We decided to retrieve the slipped stent by snare catheter. The loop snare catheter (AndraSnare AS-10, Andramed, Reutlingen, Germany) was advanced into the left ventricle. For correct positioning, we checked the position of the snare loop three dimensionally by using different fluoroscopic views and angles. After approaching the stent, we made multiple attempts to catch the stent and finally the loop of the snare trapped the middle of the stent (Fig. 3). After successfully trapping the stent, we pulled the whole catheter system back slowly to a safer place, to the abdominal aorta below the renal arteries (Fig. 4). We pulled the middle of the stent back into the guiding catheter. The stent lengthened and squeezed into the guiding catheter completely and then fortunately we pulled the whole system from the femoral sheath successfully.

Discussion

Stent losses are commonly due to failed stent deployment with dislodgement from the delivery balloon which is a potentially serious problem. That occurred in 2.0% to as many as 8.3% of procedures. The failure of stent deployment is less common with the use of current second- and third-generation stents which appear to have a higher rate of delivery success (>98%) [1–3], and are much less likely (<0.5%) to strip off the delivery balloon during attempted placement or retrieval if the stent cannot cross the target lesion [1,2]. In one study, 45% of stent loses were within the coronary arteries and outside of the coronary arteries in the remainder, but review of the literature shows that stent embolization directly to the left ventricle is rare [1,4,5]. The analyses of The German registry of the Arbeitsgemeinschaft Leitende Kardiologische Krankenhausarzte show only one case of stent loss to the left ventricle among 411 stent embolization as a result of 25,558 stent implantations.

* Corresponding author. Tel.: +90 5326254158.
E-mail address: yelgec@gmail.com (N.S. Yelgeç).

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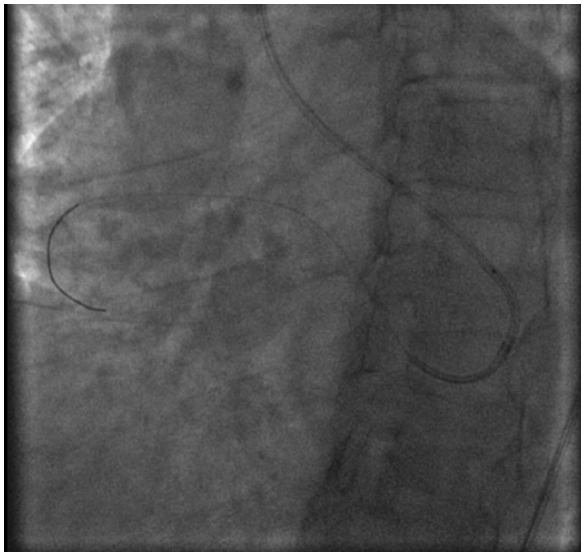

Fig. 1. Complete dislodgment of the catheter system into ascending aorta and stripped stent in front of the guiding catheter.

Fig. 2. Coronary stent in the left ventricle.

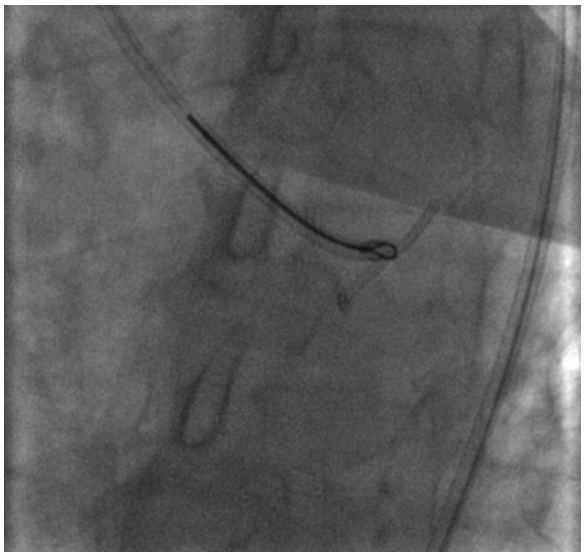

Fig. 3. Coronary stent trapped succesfully.

Fig. 4. Trapped coronary stent in abdominal aorta below renal arteries.

If stents embolize to coronary arteries, every attempt should be done to retrieve the stent because the incidence of at least one serious event is 89% whereas if the stent is retrieved it is 9%. Embolizations occurring outside of coronary arteries have a relatively benign course, the incidence of a serious event was approximately 15% if the embolization occurred outside of the coronary artery [1,6,7]. The treatment approaches to lost stents during percutaneous interventions are multiple.

Commonly used methods in order of frequency are advancing a balloon through the stent, inflating the balloon, and withdrawing the stent, use of loop snare, and twirling two wires around the stent. For the stents lost in coronary arteries, loop snare catheters are small enough to be used easily inside coronary arteries [8].

The management and retrieval approach for stents that have migrated to the left ventricle during coronary interventions is not clear. Only few case reports are available. In one case report, a migrated stent to the left ventricle was found to be stable at the basal anterior wall. The authors did not attempt any surgical or interventional retrieval, and they followed the patient by fluoroscopic and clinical examinations and no complication appeared during the follow-up period [4]. In another case report, the stent was under the posterior mitral valve leaflet. Echocardiography at 4, 7, and 12 months after the procedure revealed a competent mitral valve without thrombotic vegetation, with the stent position unchanged. The clinical course remained uneventful [1]. Finally, Yılmaz et al. reported a case where stent and guidewire moved to the left ventricle. Fortunately in this case the guidewire was within the stent. They first stabilized the stent by a gooseneck snare catheter then a low profile balloon advanced over the guidewire. They inflated the balloon at low pressure within the stent and took the stent out of the left ventricle [5]. Since the space in the left ventricle is larger than the space in coronary arteries, the use of a snare catheter is easier in the left ventricle, but there is a risk to make the stably positioned stent unstable. We may cause an innocent stent to embolize to coronary arteries or to systemic vessels while trying to catch it. So every effort should be made for not moving the stent in the left ventricle in a failed attempt but to catch it at once with only one careful attempt. Another crucial point is that two dimensional fluoroscopic images may falsely give

us the impression that we are very close to the stent, but this may not be the case in a different angle. Three dimensional confirmation of location of the snare loop by using different fluoroscopic angles and views is mandatory for correct positioning.

This case demonstrates that when a stent embolized into the left ventricle, it can easily be retrieved by a snare loop catheter. We do not know the natural history and what would happen if we allowed the stent to stay in the left ventricle without retrieving it. Expectant and conservative observation of stable stents may be more beneficial than the risk of embolization that might occur when we try to retrieve the stent. In the two cases mentioned above, managed this way and had no adverse events during follow-up period. More experience is needed to decide about this.

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