Coronary Stent Embolisation to an Iatrogenic Arteriovenous Fistula: An Unexpected Complication

R. Gouveia *, P. Monteiro, P. Brandão, P. Sousa, J. Campos, A. Coelho, R. Augusto, N. Coelho, A. Canedo

Angiologia e Cirurgia Vascular, Centro Hospitalar Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal

Introduction: Systemic embolisation of stents represents a rare complication of coronary interventions.

Report: The case of a patient with peripheral embolisation of a coronary stent while undergoing a coronary procedure for an ischaemic event is reported. The stent lodged at a previously created iatrogenic fistula joining the profunda femoral artery and the common femoral vein. An endovascular attempt was ineffective in treating this complication. The stent was removed surgically and the fistula repaired.

Discussion: This unusual clinical setting of stent embolisation concomitant to an iatrogenic arteriovenous femoral fistula is reported.

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Systemic embolisation of stents represents a rare complication of coronary interventions (<1%).1–3 It is usually related to tortuous anatomy and heavily calcified arteries through which the stent passes.2,4 Often the site of embolisation is not immediately identified and, even when it is, stent removal may not be required or be technically possible. However, this event can cause major complications with serious clinical consequences.4,5

The purpose of this report is to describe an unusual clinical setting after coronary stent embolisation.

The case of a 72 year old woman, who underwent coronary intervention at another institution after being admitted for a cardiac ischaemic event, is reported. After a failed attempt to gain access through the right groin, the chosen approach was the right radial artery. The patient presented with a stenotic lesion of the common trunk and, while attempting to perform primary stenting of that lesion, it was impossible to advance the stent. During its retrieval the stent was unintentionally released and embolised. It was identified at the level of an arteriovenous fistula, in the right lower limb, joining the profunda femoral artery and the common femoral vein. This fistula was probably created during the previous failed attempt to gain a femoral access for the same intervention, with the puncture probably being performed too low.

The patient was transferred to the authors’ institution to undergo urgent surgical coronary revascularisation, which was performed uneventfully. The patient’s recovery was slow, and the fistula was only addressed two months after the initial procedure.

The fistula had not closed spontaneously as the stent was keeping it patent. It was a high flow fistula and there was significant oedema of the right lower limb and a marginally compensated increase in cardiac preload, as she was still hemodynamically stable but with mild symptoms of difficulty breathing due to some degree of pulmonary congestion. These findings were clearly visible, both on the duplex scan performed at the authors’ institution (Fig. 1), and on the angiogram performed during the initial procedure (Fig. 2). An attempt was made to remove the stent endovascularly using a snaring system. Access was achieved through the contralateral femoral artery, but these manoeuvres were not possible owing to incorporation of the stent in both the arterial and venous walls. It was then decided to remove the stent surgically by exposure of the femoral artery bifurcation and common femoral vein. Incorporation of the stent was confirmed in both the arterial and venous walls while maintaining a high pulsatile flow in the venous component of the fistula (Fig. 3A). The stent was carefully removed and the vascular walls were repaired by simple monofilament sutures (Figs. 3B and 4). The post-operative period was uneventful and the symptoms and signs resolved. At the 2 year follow-up no new complications were reported.

Since the beginning of the endovascular era there have been multiple reports in the literature of the need for interventional treatment of embolised coronary stents. Kozman et al. reported a series of 23 patients (from 1,990 interventions) with misdeployed or embolised stents, five of which were in the peripheral vessels.2 Eight were retrieved...
by snaring. Only one patient with peripheral stent embolisation complained of non-limiting claudication, which was managed conservatively. Multiple revascularisation procedures have been reported in patients with intracoronary embolisation (both bypass operations and endovascular re-interventions), suggesting that in these small diameter vessels misplaced stents have more serious consequences.\(^2\) Bolte et al. shared their experience of stent loss during coronary interventions, reporting 411 cases of lost or mis-deployed stents (from a total of 25,558 implantations), 43 of which embolised to the femoral artery (<0.01% of the overall number of cases).\(^6\) Twenty-nine percent (118 patients) of stents were successfully retrieved, in 34% (139 patients) retrieval failed, and in 37% (154 patients) there was no attempt to retrieve the stents.\(^6\) A similar experience has been reported elsewhere.\(^5\) There are other single case reports of a more conservative treatment approach to coronary stent embolisation in both the intracoronary and peripheral circulation, without removal of the stent.\(^7,8\) However, Siani et al. reported a case of a lower limb ischaemia after stent embolisation to the common femoral artery, which was successfully managed by surgical stent removal and patching after multiple unsuccessful endovascular attempts.\(^9\)

Figure 1. (A) Duplex scan showing the stent in the iatrogenic fistula (AVF) joining the profunda femoral artery (PFA) and common femoral vein (CFV). (B) Doppler flow evaluation at the level of fistula showing very high velocity and low resistance flow.

Figure 2. Angiograms showing the coronary stent lodged at the proximal portion of the profunda femoral artery (arrow) and the early contrast filling of the common femoral vein due to the arteriovenous fistula.
There is no report in the literature of a coronary stent embolised to an iatrogenic arteriovenous fistula. In the present anecdotal case the embolised stent was, in fact, keeping the fistula patent, which would probably otherwise have closed spontaneously. It is possible that an earlier endovascular procedure would have been more successful as the attachment of the stent to the vessel wall would not have been so pronounced. However it seems that surgical removal of stents in this clinical setting could be an effective and safe treatment, owing to embedding of the stent in the vessel wall.

CONFLICT OF INTEREST
None.

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