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Case Report

STENT DISLODGEMENT DURING PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN PATIENT WITH MYOCARDIAL INFARCTION AND PULMONARY EMBOLISM: A CASE REPORT

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SUMMARY – A 74-year-old patient was hospitalized because of pulmonary embolism and deep venous thrombosis. Standard medication therapy was administered but the inferolateral ST elevation myocardial infarction (STEMI) occurred only a few hours after the admission. Coronary angiography was performed, and circumflex artery (ACx) occlusion verified. Initially, thromboaspiration was done, the lesion was predilated with a semi-compliant (SC) balloon and drug eluting stent (DES) was placed. The control angiogram showed a filling defect at the occlusion site, while the expanded stent was visualized in the left main (it did not adequately detach during inflation and was pulled retrograde to the guide catheter). We attempted to remove the stent by passing an SC balloon over the stent and it was pulled under fluoroscopic guidance to the brachial artery. An effort was then made to extract the stent using ˝twisting guide wire technique˝, but without success. Finally, the stent was grasped with an EN Snare® device and removed completely through the sheath. The procedure ended with the repositioning of the guide catheter and implantation of a new stent. In further hospitalization, gastroenterological workup was planned, but because of septic shock and COVID infection, the patient died due to multiorgan failure.

Key words: *stent, device removal, percutaneous coronary intervention, acute coronary syndrome, complications*

Introduction

Coronary stent dislodgement and embolization (stent loss) is a known complication of percutaneous coronary interventions with a reported incidence ranging from 0.21% to 8.4%, and a pooled estimate of 1.3% [1]. Percutaneous management of stent loss is successful in most cases with surgical retrieval as a bailout option. As this complication may lead to life-threatening consequences, it is important that all interventional cardiologist become acquainted with retrieval techniques. Here, we present a case report of stent dislodgement and successful retrieval using multiple percutaneous techniques.

Case Report

A 74-year-old female patient was hospitalized in Coronary Care Unit because of intermediate to high-risk pulmonary embolism with clinical signs of deep venous thrombosis of the left leg. In the laboratory workup microcytic anaemia was found with very high levels of all tumour markers. Standard therapy with a low molecular weight heparin and oxygen was administered, but only few hours after admission the patient

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developed inferolateral STEMI. Urgent coronary angiography through the right radial approach was performed verifying distal ACx occlusion (Figure 1), while the left anterior descending artery (LAD) and the right coronary artery (RCA) had no significant stenoses. An extra backup (EBU) guide catheter was positioned and the Sion blue guidewire passed through the occlusion. First, thromboaspiration with Export catheter was performed, the lesion was then predilated with an SC balloon 3.0 x 20 mm after which there was still some residual thrombotic defect, and DES Ultimaster Tansei 3.0 x 38 mm was deployed into the lesion (Figure 2). The control angiogram showed a persistent filling defect at the occlusion site, while the expanded stent was visualized in the left main - it did not completely detach from the balloon during inflation and was pulled retrograde to the guide catheter (Figures 3,4). We attempted to remove the dislodged stent by passing an SC balloon 3.0 x20 mm through the expanded stent into the mid ACx. The balloon was inflated there to 8 Atmospheres and it pulled along with the stent, guidewire and guide catheter under fluoroscopic guidance to the brachial artery (Figure 5). Then the 6 F sheath was changed for a 7 F and we attempted to extract the stent using multiple coronary 0.014 wires that were passed through stent struts (˝twisting guide wire technique˝), but without success. Finally, the stent was grasped with an EN Snare device- Standard 9-15 mm, length 120 cm, 6F (Figure 6) and removed completely through the sheath with deformation of the stent structure, but without fracture (Figure 7). After stent removal, we did a control angiography of the arteries in the forearm, which showed no vascular lesions (Figure 8). The activated clotting time (ACT) was then checked and

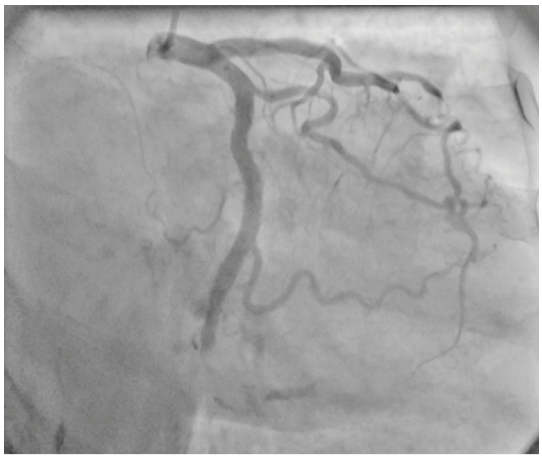

Figure 1: Occlusion of ACx with thrombotic mass

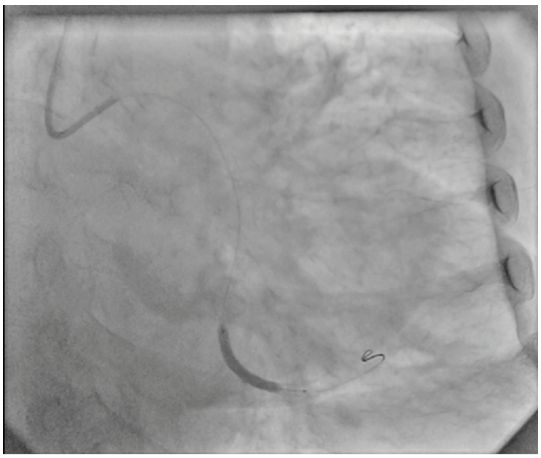

Figure 2: Stent placement into the lesion of the ACx

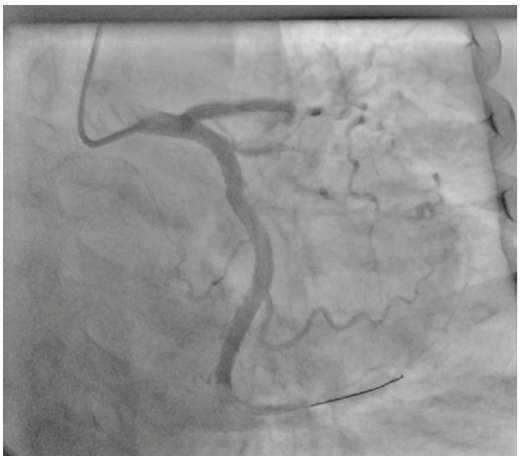

Figure 3: Angiogram of the ACx after stent deployment

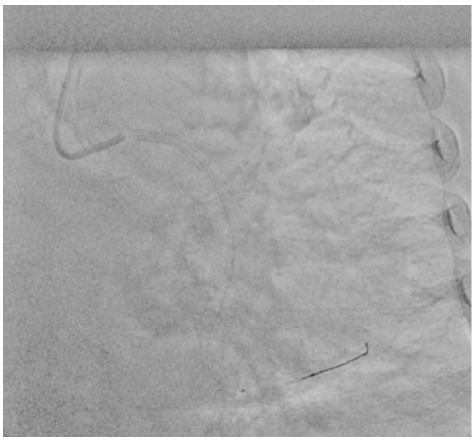

Figure 4: Visualisation of the stent in the left main/ proximal ACx

Figure 5: Stent in the brachial artery after it was pulled retrograde from the left main (LM)

Figure 6: Stent grasping with the EN Snare device

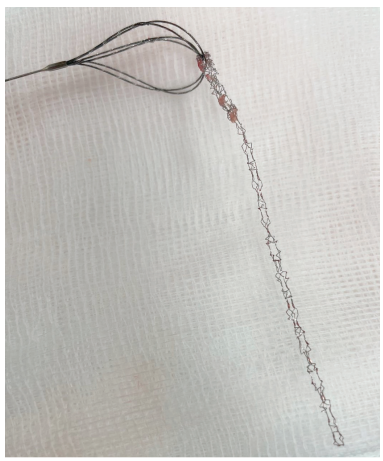

Figure 7: Deformed stent after extraction with EN Snare device

Figure 8: Angiogram of the brachial artery after stent extraction showing no perforation

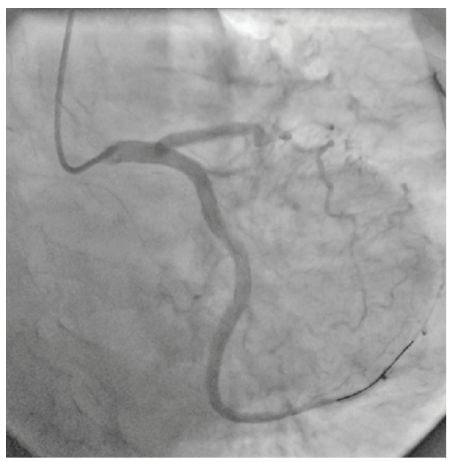

Figure 9: Final angiogram of the ACx after percutaneous coronary intervention

corrected by adding Heparin 3500 IU i.v., the guide catheter was reinserted, followed by a Sion blue wire and implantation of a 3.0 x 33 mm Xience Xpedition stent into the lesion. Proximal segment of the stent was postdilated with non-compliant (NC) balloon 4.0 x15 mm, showing optimal angiographic result (Figure 9). Early postprocedural course was uneventful. Due to the unprovoked pulmonary embolism and concomitant myocardial infarction, we considered paradoxical embolism due to a patent foramen ovale in differential diagnosis, but further workup revealed multiple liver metastases with a high suspicion of abdominal tumour, the hospital course was then complicated by the septic shock and COVID infection. Unfortunately, the patient died due to multiorgan failure before additional diagnostic procedures.

Discussion

Stent embolization into coronary or systemic circulation is rare, but potentially fatal complication, which can lead to acute myocardial infarction, stroke, thrombosis, emergency coronary artery bypass graft and death [1, 2,3]. Predisposing factors for this complication can be related to the vessel, procedure or the patient. The most common, vessel-related factors are heavy calcification, tortuosity, significant proximal angulation, long and distal lesions and in-stent restenosis [4,5]. Procedure-related factors include poor guide catheter or guidewires support, inadequate vessel preparation, use of small size stents, use of ultrathin stents and direct stenting [6,7]. Movement of the patient during the procedure can also lead to stent dislodgement. There are several percutaneous management options, whereas surgical intervention is mainly required if the stent causes coronary occlusion with hemodynamic instability [2]. The most common retrieval techniques include balloon inflation distal to the stent, snare devices, ˝twisted guidewire technique˝, multipurpose baskets and myocardial biopsy forceps [8]. This case represents various attempts with successful stent retrieval by a combination of balloon inflation distal to the stent, which allowed stent retraction to the peripheral vessel and facilitated final extraction with the EN Snare device.

Conclusion

Although coronary stent dislodgement represents a rare complication of percutaneous coronary interventions, the repercussions can be severe, even life-threatening. According to the literature, percutaneous management is feasible in most cases. To promote a successful outcome without further complications and the need for operative treatment, interventional cardiologist should be familiar with percutaneous manoeuvres for the retrieval of dislodged stents and catheterization laboratories should be equipped with proper instruments.

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Sažetak

GUBITAK STENTA TIJEKOM PRIMARNE PERKUTANE KORONARNE INTERVENCIJE KOD PACIJENTA S INFARKTOM MIOKARDA I PLUĆNOM EMBOLIJOM: PRIKAZ SLUČAJA

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Bolesnica u dobi od 74 godine hospitalizirana je pod kliničkom slikom plućne embolije te duboke venske tromboze lijeve potkoljenice. Započeta je standardna medikamentna terapija, no nekoliko sati po prijemu dolazi do razvoja STEMI inferolateralne regije. Učini se hitna koronarografija te verificira okluzija cirkumfleksne arterije. Najprije se učini tromboaspiracija Export kateterom, zatim se lezija predilatira sa SC balonom i postavi DES Ultimaster Tansei 3.0 x 38 mm. Kontrolni angiogram nadalje pokazuje defekt punjenja na mjestu okluzije, dok se raspuhani stent vizualizira u ostiju debla lijeve koronarne arterije (nije se adekvatno odvojio od balona tijekom inflacije te je povučen retrogradno do vodećeg katetera). Potom se preko stenta provuče SC balon te se balon, stent, vodeći kateter i žica uz fluoroskopsku kontrolu izvlače do radijalne arterije u podlakticu. Zatim se neuspješno pokuša izvlačenje stenta tehnikom s više dilatacijskih žica koje se provuku kroz stent. Finalno se pomoću EN Snare katetera uhvati stent te se uz deformaciju strukture uspije izvući u cijelosti preko uvodnice. Procedura završava ponovnim postavljanjem vodećeg katetera i implantacijom stenta Xience Xpedition 3.0 x 33 mm. U daljnjoj hospitalizaciji bila je planirana gastroenterološka obrada, no dolazi do razvoja septičkog zbivanja uz COVID infekciju i razvoj višeorganskog zatajivanja te nažalost smrtnog ishoda bolesnice.

Ključne riječi: *stent, perkutana koronarna intervencije, akutni koronarni sindrom, komplikacije*