

A Double Whammy-Stent Fracture and Dislodgement during PCI

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Citation: Punish Sadana, Preeti Sharma (2025) Intravascular Lithotripsy in Stent Failure in Calcified Vessel in Acute MI Setting, J Case Rep Stud 13(1): 105

Received Date: June 27, 2025 **Accepted Date:** July 27, 2025 **Published Date:** July 31, 2025

Abstract

Coronary stent fracture is a rare complication of stent implantation. The reported incidence of stent fracture among present drug-eluting stents from various studies ranges from 1% to 8%. Coronary stent dislodgement and embolization is also a rare complication in the current era of percutaneous coronary angioplasties. The incidence of stent loss has significantly reduced as stents were precrimped in factory itself. It is often benign and managed conservatively by retrieval by smaller balloon or snare, deployment at appropriate location or crushing of the stent, rarely requiring surgical intervention. We present a case of Elderly female with both the complications during PCI managed effectively

Keywords: Stent Loss/Dislodgement, Stent Embolisation, PCI (Percutaneous coronary intervention), in-stent restenosis, stent fracture (SF), stent thrombosis

Introduction

Coronary stent fracture is a relatively rare complication of stent implantation. The reported incidence of stent fracture among present drug-eluting stents from various data ranges from 1% to 8%. Literature shows that the risk for stent fracture was higher in right coronary artery location, increased vessel tortuosity severe angulation prior to stenting, use of overlapping stents, and use of longer stents. It can cause thrombosis, ISR, aneurysm .. The incidence of stent loss has significantly reduced as stents were precrimped in factory itself. It is often benign and managed conservatively by retrieval by smaller balloon or snare, deployment at appropriate location or crushing of the stent, rarely requiring surgical intervention. However, dreaded complications can occur if the stent embolizes into the vital organs.

Case Report

A 64 year old female a known case of Diabetes Mellitus, hypertension and hypothyroidism presented with chest pain on exertion for two months for two hours duration. On Evaluation her vitals were stable, systemic examination doesn't showed any abnormality. ECG showed sinus rhythm with no significant st-t changes and echo showed EF of 55%.

CAG done which revealed single vessel disease with mid LAD 80% stenosis (Figure 1). Patient was taken for PTCA to LAD. Stenting was done with 3x24mm DES. Post dilation done with 3mm balloon upto 18atm. Check shot revealed some haziness and stent boost and IVUS revealed stent fracture (Figure 2,3,4) .Then 3x12mm DES was taken to cover the fractured part but it was small in length ,while taking it out it got dislodged in distal left main and prox LAD so deployed there itself. In the next an-gio shot 3x12mm DES dislodged slight distally ,it was postdilated with 3.5x8mm balloon and fixed there itself (Figure5). There was severe spasm in radial artery and during maneuvering whole of the system including guiding catheter and wire came out. Rt femoral puncture done and Left coronary artery was hooked using 6F EBU catheter. Several attempts were made to cross guidewire but failed so double lumen catheter taken to cross the distorted stent. With the help of guideliner another 3x33mm DES deployed from proximal to mid LAD with TIMI III flow (Figure 5, 6)

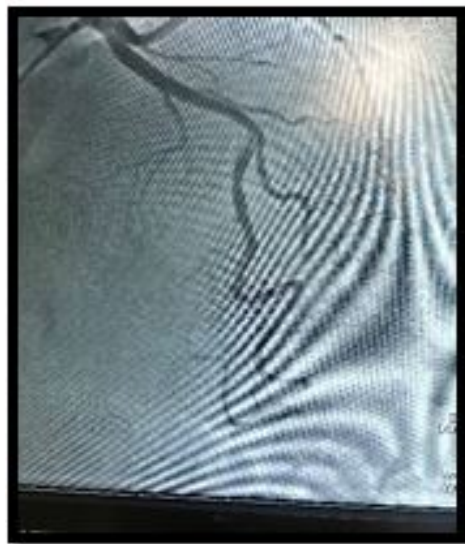


Figure 1: Mid LAD 80% stenosis



Figure 2: Post stenting

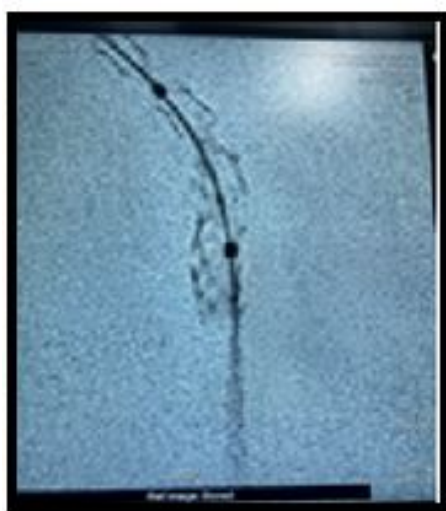


Figure 3: Stent boost-stent fracture

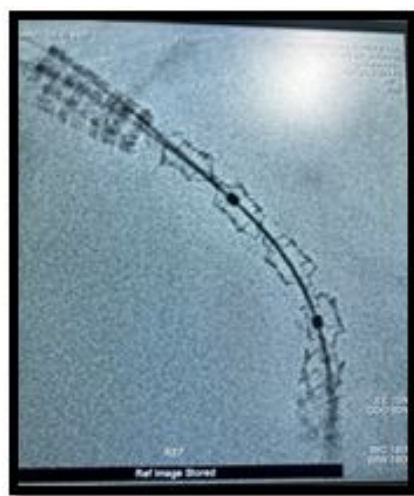


Figure 4: Stent distortion increased



Figure 5: Overlapping stent



Figure 6: Final shot-TIMI III flow

Discussion

Coronary stent fracture is a relatively uncommon and rare complication of stent implantation. The reported incidence of stent fracture among drug-eluting stents ranges from 1% to 8%. Literature shows that the risk for stent fracture was higher in right coronary artery location, increased vessel tortuosity, angulation prior to stenting, use of overlapping stents, and use of longer stents, higher postdilation pressure. Stent fracture does not happen equally among different stents, and more frequent stent fracture was seen with stainless steel stents comparing with cobalt-chromium platform stents signaling less sturdiness with stainless stents, which should somewhat explain why cobalt-chromium stents are associated with improvement of clinical outcomes. There is no consensus on the best diagnostic imaging modality for detection of stent fractures, but conventional angiography is not sufficiently sensitive for this purpose. Other imaging modalities can be used, including IVUS, stent boost, MDCT, and OCT. Depending on the diagnostic tool that is used, numerous classifications of SF have been suggested. As per Allie et al. there are four types of SF- type I - single strut fracture, type II - multiple strut fractures at different sites, type III - complete transverse linear fracture without displacement and type IV –complete stent displacement. There is an additional type V with formation of a gap between stent fragments by Jaff et al. .It may be asymptomatic, can cause acute vessel closure due to thrombosis, ISR, aneurysm formation and TLR. Treatment includes conservative management, restenting, DEB(drug eluting balloon) or

surgery.

Among coronary devices, Coronary stents are most commonly embolized, with an incidence of approximately 0.9%-8.3%, during Percutaneous Coronary Interventions (PCI). Stent dislodgement was more frequent in old times when stents were crimped manually onto the balloon but now a days they were precrimped in factory itself and dislodgement rates are drastically reduced. Although rare, stent dislodgment can cause cerebral embolism or intracoronary thrombosis and lead to life threatening complications like Cerebrovascular Accident (CVA) and Myocardial Infarction (MI). Angulated, severely calcified lesion, inadequate lesion preparation, non coaxial guidecatheter, forceful pushing or pulling of the stents are the common causes of stent dislodgement. It can be partial or complete stent loss with or without guidewire in situ. Position of dislodged stent also is very important. Management varies from retrieval using small balloon, multiple wire technique or snare or surgical, crushing the stent along the vessel wall, sequential dilation and deploying the stent there itself.

Conclusion

Coronary artery stent dislodgement and fracture are rare but sometimes fatal complications during PCI. Stent fracture treatment includes conservative treatment, DEB or restenting and in rare case bypass surgery. Treatment of stent dislodgement includes retrieval by various available techniques, deploying it there itself or crushing against the vessel wall.

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