

# A Deployed Stent Dislodgement during Retrieval of Stent-Jailed Side Branch Guidewire: An Unusual Complication



## Stentle Hapsedilmiş Yan Dal Telinin Geri Çekilmesi Sırasında İmplant Edilmiş Stentin Yerinden Ayrılması: Sıradışı Bir Komplikasyon

Video 1 : Cine angiogram showed that after implantation the stent was almost fully deployed and jailed side branch guidewire was twisted.

Video 2 : Cine showed that after retraction of the jailed guidewire, implanted stent was lost.

Video 3: Final angiographic result.

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**ABSTRACT** Coronary stent dislodgement is a very rare complication during the percutaneous coronary intervention. It is associated with significant morbidity, systemic or coronary embolization, acute myocardial infarction, emergency coronary artery bypass surgery, vascular access complications, cerebrovascular complications and death. A deployed stent dislodgement is even more rare. We report an unusual complication of a deployed stent dislodgement during retrieval of stent jailed side branch guidewire and retrieval from popliteal artery via snare method. Stent dislodgements usually occur with undeployed stents while retraction of the stent into the guiding catheter. Risk factors for stent loss and dislodgement are severe calcification, tortuosity, failed stent retraction into the guiding catheter and failure to cross the lesion. Stent dislodgement can be treated either surgically or percutaneously.

**ÖZET** Koroner stent yerinden ayrılması modern perkütan koroner girişim çağında çok nadirdir. Koroner stent yerinden ayrılması belirgin morbidite, sistemik ve koroner embolizasyon, akut miyokard infarktüsü, acil koroner bypass, vasküler giriş ve serebrovasküler komplikasyonlarla ilişkilidir. İmplant edilmiş stentin yerinden ayrılması daha da nadirdir. Biz sıradışı bir komplikasyon olan, yan dal telinin geri çekilmesi esnasında implante edilmiş stentin yerinden ayrılması ve popliteal arterden loopsnare yöntemi ile alınmasını sunuyoruz. Stent yerinden ayrılması genellikle stentin kılavuz katetere geri çekilmesi sırasında açılmamış stentlerde görülür. Stent kaybı ve yerinden ayrılması için risk faktörleri; şiddetli kalsifikasyon, tortuozite, kılavuz katetere stent geri çekilmesinde başarısızlık ve lezyonun geçilememesidir. Stent yerinden ayrılması cerrahi veya perkütan olarak tedavi edilebilir.

**Keywords:** Coronary artery disease; percutaneous coronary intervention

**Anahtar Kelimeler:** Koroner arter hastalığı; perkütan koroner girişim

Coronary stent dislodgement is a very scarce complication in the modern percutaneous coronary intervention era. A deployed stent dislodgement is even more rare. The frequency of the stent dislodgement occurrence varies from 0.32 to 8.3%.<sup>1</sup> It is related to severe morbidity, such as systemic or coronary embolization, acute myocardial infarction,

coronary artery bypass graft surgery, vascular access complications, cerebrovascular complications and death.<sup>1,2</sup> We herein describe an extraordinary complication of a deployed stent dislodgement during retrieval of stent-jailed side branch guidewire and retrieval from popliteal artery via a snare method.

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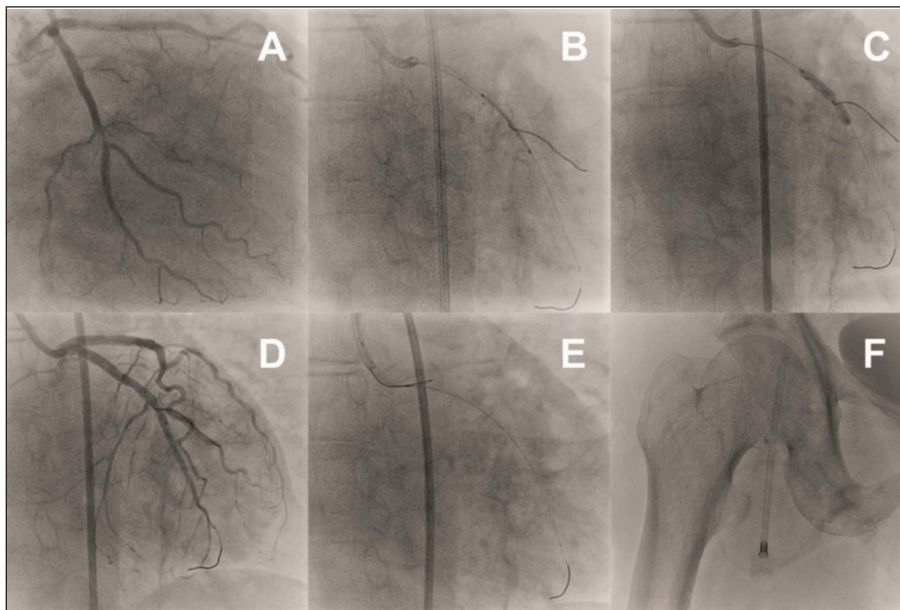
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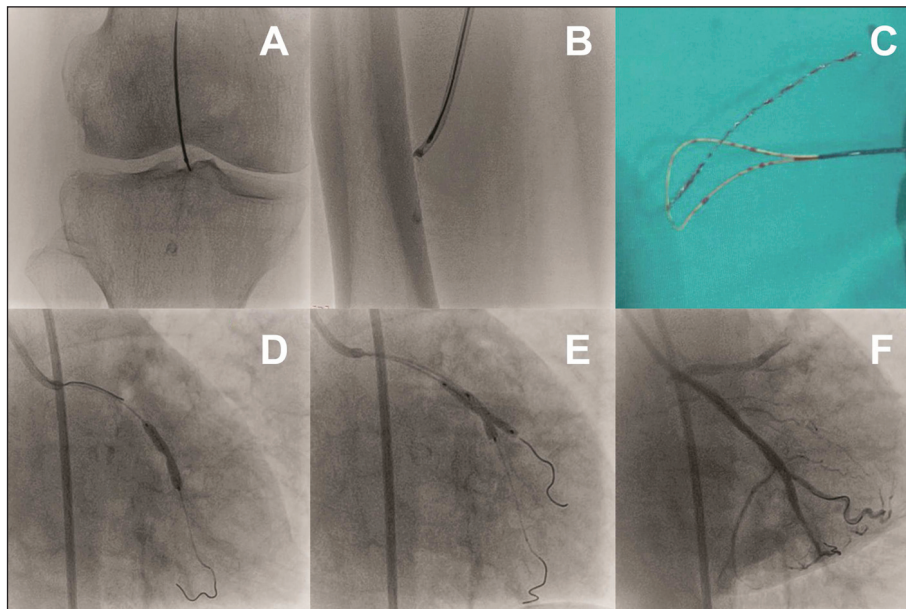
## CASE REPORT

A 74 year-old woman was admitted to our clinic with unstable angina. Coronary angiography was performed through the right femoral artery. Coronary angiography revealed severe stenosis of the circumflex artery just before the major obtuse marginalis, left anterior descending artery and right coronary artery was normal (Figure 1A). We decided to perform the percutaneous coronary intervention to the circumflex artery. The left coronary ostium was selectively engaged with a 6 Fr JL4 guiding catheter. First, a 0,014-inch floppy guidewire was advanced into the major obtuse marginalis for side branch prevention and the second 0,014-inch guidewire was inserted to the circumflex artery. A 2.5x18 mm resolute integrity drug-eluting stent (DES) was advanced to the lesion and we noticed that the side branch guidewire was twisted (Figure 1B). The stent was implanted to the lesion at a nominal pressure (Figure 1C). After balloon deflating, a cine angiogram showed that the stent was almost fully deployed and jailed side branch guidewire was twisted (Figure 1D, Video 1). Then the balloon was retracted into the guiding catheter. There was a

resistance on the side branch guidewire while retracting into the guiding catheter. The jailed wire was pulled back forcefully without any break. But after retraction of the jailed guidewire, implanted stent was lost (Figure 1E, Video 2). Fortunately, there was no dissection on the coronary arteries and the coronary flow was TIMI 3. We noticed that the stent balloon complex was in the tip of the guiding catheter. The cine view of the stent was deformed and elongated (Figure 1E). We pulled back to the entire system including guiding catheter, wires and stent balloon complex. When the system came to the tip of the sheath, the stent was entrapped by sheath. Subsequently, stent was eluded from the balloon and advanced behind the middle part of the sheath (Figure 1F). Then we decided to retrieve the stent via snare method. We proceeded a right diagnostic catheter via left femoral 7 Fr sheath to the right femoral artery. The stent advanced to the popliteal artery (Figure 2A). We advanced an AndraSnare AS -15 SET in the right Judkins catheter and the stent was caught and retrieved from to the popliteal artery via a snare system (Figure 2B). The stent was deformed and elongated (Figure 2C). This time we decided not to wire



**FIGURE 1:** (A) Coronary angiography shows critical stenosis of the circumflex artery just before the major obtuse marginalis. (B) 2,5x18 mm resolute integrity drug-eluting stent was advanced to the lesion and side branch guidewire was twisted (C) The stent was implanted at nominal pressure at 9 atm. (D) Cine angiogram demonstrates the stent was almost fully deployed and side branch guidewire was twisted. (E) After retraction the jailed guidewire stent was lost. (F) The stent was behind the middle part of the sheath.



**FIGURE 2:** (A) The stent advanced to the popliteal artery. (B) The stent was caught via snare from the popliteal artery. (C) The stent was deformed and elongated. (D) We implanted the stent at nominal pressure at 9 atm. (E) The major obtuse marginalise was wired with 0,014-inch floppy wire and we performed kissing balloon with a 2.5x18 mm and 2,0x15 mm semi-compliant balloons. (F) Final angiographic result.

side branch and 2,5x18 mm resolute integrity DES was implanted to the lesion (Figure 2D). After that, the major obtuse was wired with 0,014 floppy wire through the stent strut and we performed kissing balloon with a 2.5x18 mm and 2,0x15 mm semi-compliant balloons (Figure 2E). Final coronary angiography showed a good result (Figure 2F, Video 3). There was no problem in the follow-up of the patient.

Informed consent was taken from the patient.

## DISCUSSION

Coronary stent dislodgement can occur during the percutaneous coronary intervention and can be associated with severe complications. Risk factors for stent loss and dislodgement are severe calcification, tortuosity, stent retraction inside the catheter, and failure to cross the lesion.<sup>2</sup>

Stent dislodgements usually occur with undeployed stents while retraction of the stent inside the guiding catheter. There are a few reports in the literature about deployed stent dislodgements.<sup>3-8</sup> There are several mechanisms related to stent dislodgement. In previous reports, stent dislodgement usually occurred because of the stent which was entrapped to

the the previous implanted stent while retrieving the undeployed stent inside the guiding catheter.<sup>4-6</sup> Gan et al. reported a LAD stent dislodged while removal of the balloon because of the wire was under the first stent strut.<sup>3</sup> Reffelmann et al. reported previously implanted stent dislodgement while retraction the cutting balloon because of the blades of the cutting balloon became stuck in the stent struts.<sup>8</sup> Bowerman et al. reported retrieval of a implanted stent has caused the dislodgement of a stent during directional atherectomy for restenosis within a previously implanted stent.<sup>7</sup> Celik et al. reported a case of a deployed stent migration in the right coronary artery after nitrate performing because of an undersizing.<sup>9</sup>

Stent dislodgement can be treated either surgically or percutaneously. Several percutaneous techniques can be used for retrieval of dislodged stents including small balloon technique, double-wire technique, loop snare technique, biliary forceps, and basket retrieval devices.<sup>1,5,10</sup> We used loop snare technique in this case and we retrieved the dislodged stent successfully from popliteal artery.

Two possible reasons led to this complication. The main problem was related to the wire in the side

branch which was twisted around the implanted stent in the main vessel. The twisted wire was able to be withdrawn forcefully into the guiding catheter and then the wire caused the stent to be dislodged into catheter. The cause of the twisted appearance was that the side branch guidewire was withdrawn to main vessel minimally and twisted around the stent during stent positioning. The second reason was that there was no pre-dilation of the calcific lesion. So these factors cause not to ensure complete stent apposition. If we support adequate pre-dilation first, the stent strut could have been apposed the vessel wall tightly. To the best of our knowledge, there have been no cases of deployed stent dislodgement during retrieval of stent jailed side branch guidewire. In conclusion, interventional cardiologists can encounter such complications, including stent dislodgements and stent loss during the percutaneous coronary intervention in daily practice. So, interventional cardiologists should be aware of all kinds of complications and managements during percutaneous intervention in the catheter laboratory.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

**Idea/Concept:** Ömer Faruk Keskin, Mustafa Demir, Atila İyisoğlu; **Design:** Ömer Faruk Keskin; **Control/Supervision:** Mustafa Demir, Atila İyisoğlu; **Data Collection and/or Processing:** Ömer Faruk Keskin; **Analysis and/or Interpretation:** Mustafa Demir, Atila İyisoğlu; **Literature Review:** Ömer Faruk Keskin; **Writing the Article:** Ömer Faruk Keskin, Mustafa Demir; **Critical Review:** Atila İyisoğlu.

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