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A Very Rare Complication of Chronic Total Occlusion (CTO) Intervention: Tip of Corsair Micro-Catheter Punctured By Guide-Wire

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ABSTRACT

Intervention of chronic total occlusion (CTO) requires long-term experience and attention. Despite new techniques and guide-wires, the success rate is lower than non-CTO intervention. Also CTO intervention has risk for vessel dissection and perforation. In this case, we present at punctured of corsair micro catheter by the guide-wire during CTO intervention.
Key Words: Chronic total occlusion; corsair micro-catheter; complication; perforation

Kronik Total Oklüzyon (KTO) Girişiminin Nadir Bir Komplikasyonu: Korsair Mikro-Kateter Ucunun Kılavuz Tel ile Delinmesi

ÖZET

Kronik total oklüzyon (KTO) girişimleri uzun süreli deneyim ve dikkat gerektirir. Yeni tekniklere ve kılavuz tellere rağmen başarı oranı non-KTO girişimlerine göre daha düşüktür. Ayrıca KTO girişimleri damar diseksiyonu ve perforasyonu riski taşır. Bu makalede KTO girişimi sırasında kılavuz tel tarafından delinen korsair mikro-kateter olgusunu sunuyoruz.
Anahtar Kelimeler: Kronik total oklüzyon; korsair mikro-kateter; komplikasyon; perforasyon

INTRODUCTION

Chronic Total Occlusions (CTO) is defined complete occlusion (Thrombolysis in myocardial infarction grade 0 flow) and angiographic or clinical evidence or high likelihood of an occlusion duration ≥3 months[1,2]. CTO lesions are encountered in approximately 8%-15% of total percutaneous coronary interventions (PCI)[3,4]. Many more CTO lesions are treated with coronary artery by-pass graft surgery (CABG) because of the low success and high restenosis and complication rate[5,6]. But advances in the use of coronary imaging, interventional devices, and novel interventional techniques hold promise for improving the success rates of CTO PCI[7]. Newly developed guide-wires increase the success rate but serious complications can occur with guide-wire. This paper presents punctured of corsair by the guide-wire during CTO intervention case. We aimed to show that CTO intervention is open to complications and the conquest -pro series guide-wire are safe despite so hard.

CASE REPORT

A 59 year-old man was admitted to hospital with non ST segment elevation myocardial infarction. The patient had known hypertension and smoking. There was no history of diabetes mellitus. His family history was significant for coronary heart disease. The physical examination was normal, blood pressure was 190/110 mmHg and heart rate was 70 bpm. Electrocardiogram showed sinus rhythm and T wave invertion in leads D1 avl. There were increases in CK-CK MB and troponin levels. Transthoracic echocardiogram showed hypokinesis apikal-mid segment of interventricular septum and anterior wall with global left ventricular ejection fraction of 45%-50%. Left coronary angiogram demonstrated a thrombolysis myocardial infarction (TIMI) flow grade 0 in the mid left anterior descending artery (LAD) (Figure 1A). The distal portion LAD was filled with a well-developed septal collateral connection from the posterior descending artery (PDA) on a right coronary angiogram (Figure 1B). Because of the CTO had a short lesion we planned the antegrade approach. The left coronary artery was catheterized with a 7 Fr XB 3.5 guiding catheter (cordis corporation) through the right femoral artery for antegrade access and the right coronary artery with a 6 Fr JL 4 diagnostic catheter for fill the distal LAD through the left femoral

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artery. A 0.014", 2.8 Fr, 135 cm coronary micro-guide Corsair catheter (Asahi Intec) with a 0.014" Fielder XT wire (Asahi Intec) was used to for crossing LAD lesion. Since the wire could not cross the lesion, the Fielder XT wire was then changed sequentially to Miracle 3-g, Miracle 6-g and then Conquest pro 12-g wires (Asahi Intec) in order to cross the occluded site of LAD. Conquest-Pro 12 pass the lesion and we confirmed that the wire in the distal LAD lumen by contralateral injection. Despite all our efforts the corsair has not passed the lesion. We thought it was due to severe calcification and planned to change with tornus catheter. When we receive back to corsair catheter, we have seen that the tip bends and the corsair was punctured by conquest pro guide-wire (Figure 2) then lesion was done pre-dilatation with tornus and balloon catheter, two stents (2.25x30 mm and 2.5x30 mm DES) were placed the LAD and one stent (2.5x18 mm DES) placed diagonal branch with an excellent final angiographic result (Figure 1C).

DISCUSSION

Currently different wires developed for various techniques. Hydrophilic coating and low-profile tips guide-wires permit to find micro-channels within the CTO that may allow access to distal vessel. Wires have also been developed that have more support at the wire tip, improving torque control of the tip for the operator and providing a greater ability to push the wire tip through coronary occlusions with minimal alteration or deflection of the tip[8]. For example miracle series guide-wires generally use for the drilling technique. In the drilling technique, the guide-wire is rotated clockwise and counterclockwise while the tip pushed modestly against the CTO lesion. The conquest pro guide-wire primarily uses penetration technique that the operator aims at the target with tip of the guide-wire without clockwise and counterclockwise rotation. The penetration of the conquest-pro series guide-wires are so high, these guide-wires behave like needles[9]. But it has an effective hydrophilic coating on the spring coil shaft, but not on the ball tip, which facilitates the capture of the small dimple at the entery paint and helps prevent the guide-wire tip from into the subintimal space[10]. If one pushes the wire hard, it will easily go into the subintimal space[9]. When the guide-wire tip slips into the subintimal space the size of created pseudolumen may be smaller because of the thinner guide-wire tip and reduced rotation. This may allow subintimal wire again re-entering to the distal lumen. Also when the guide-wire perforate the vessel, the thin tapered tip makes a smaller hole, thus reduces the risk of major extravasation, but the risk of extravasation may increase if the guide-wire punches out repeatedly regardless of the wire type even if the hole is small at the perforation site[10].

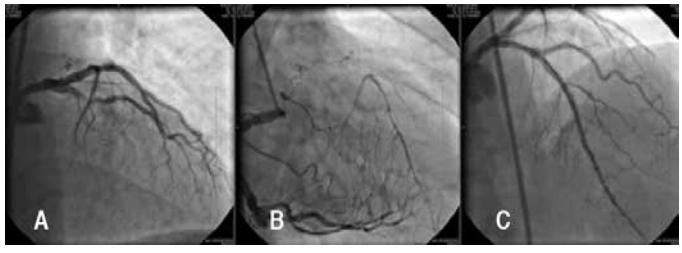

Figure 1. A- Left coronary injection showing occlusion in the mid left anterior descending artery (LAD), **B-** Right coronary injection showing the distal portion LAD was filled with a well -developed septal collateral connection from the posterior descending artery, **C-** Final angiographic result

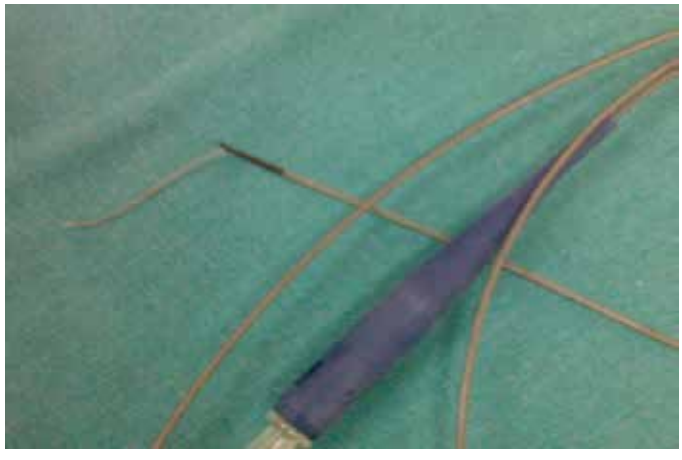

Figure 2. The tip of corsair bends and punctured by conquest pro12 guide-wire

Despite mortality and morbidity benefits PCI for CTO is associated with, greater radiation exposure, need for a greater amount of contrast media and longer procedure times compared to interventions in non-CTO lesions. Also CTO PCI carries a significant risk for vessel dissection because aggressive coronary guide-wires are advanced into vascular space that cannot be visualized on fluoroscopy. Severe dissection can result in vessel perforation and tamponade[9]. An experienced CTO PCI center in Japan recently reported in hospital complication rates of 0.5% for death, 3% myocardial infarction, 0.2% for emergency CABG and 0.6% for tamponade[11]. Al-Lamee et al. showed that the device causing perforation was intracoronary guide-wire in 17.9%[12].

CONCLUSION

Intervention of CTO requires long term experience, attention and patience. Developed hard-tipped wires increase the success of process. If we are not careful and we don't enough experience they can lead to complication such as perforation and tamponade. The conquest-pro series guide-wires is so hard but the special structure of its prevents pass into the sub intimal space, such as in this case.

CONFLICT of INTEREST

The authors reported no conflict of interest related to this article.

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