

# Primary percutaneous coronary intervention (p-PCI) via Tiger diagnostic catheter in a case of abnormal take-off of left main coronary artery

Pierwotna przezskórna interwencja wieńcowa za pomocą cewnika diagnostycznego typu Tiger w przypadku nietypowego odejścia gałęzi pnia lewej tętnicy wieńcowej

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## Abstract

The use of smaller catheters for diagnostic and intervention purpose is becoming increasingly popular due to the shift towards transradial catheterisation. The use of smaller catheters permits smaller arterial punctures, which translates into early mobilisation and discharge, as it may obviate the need for closure devices, lesser contrast volume use, potential nephrotoxicity and decreased morbidity. Here, we report a case, where standard 5 F Tiger diagnostic catheters (Terumo Radifocus Optitorque, Japan) was used for primary percutaneous coronary intervention of left circumflex artery with abnormal take-off of the left main.

Key words: Tiger diagnostic catheter, primary percutaneous coronary intervention, abnormal take-off

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## Introduction

Since the completion of the first human percutaneous coronary balloon angioplasty in 1977 by Gruentzig, [1] there is a constant human endeavour to miniaturise interventional hardware's. In fact, 9–10 F guiding catheters being used in the past are getting replaced by 6 F guiding catheters, which have become standard of care in modern era. The use of smaller catheters for diagnostic and intervention purpose is also becoming increasingly popular due to the shift towards transradial catheterisation. The use of smaller catheters permits smaller arterial punctures, which translates into early mobilisation and discharge, as it may obviate the need

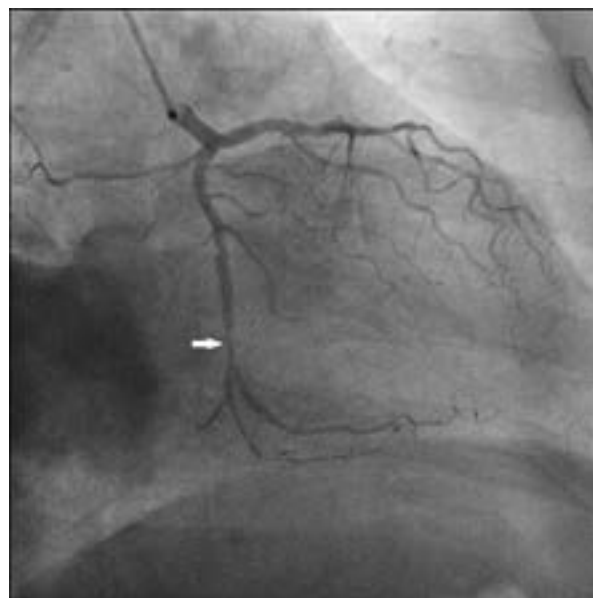
for closure devices, lesser contrast volume use, potential nephrotoxicity and decreased morbidity [2, 3, 4]. Here, we report a case, where standard 5 F diagnostic catheters was used for primary percutaneous coronary intervention (p-PCI) with drug eluting stent-on-a-wire system (TIG catheter; Terumo Radifocus Optitorque, Japan).

## Case report

A 36-year-old male presented with retrosternal chest pain and sweating of four hours duration. He was hypertensive for one year, currently being on antihypertensive medications. His physical examinations and biochemistry were

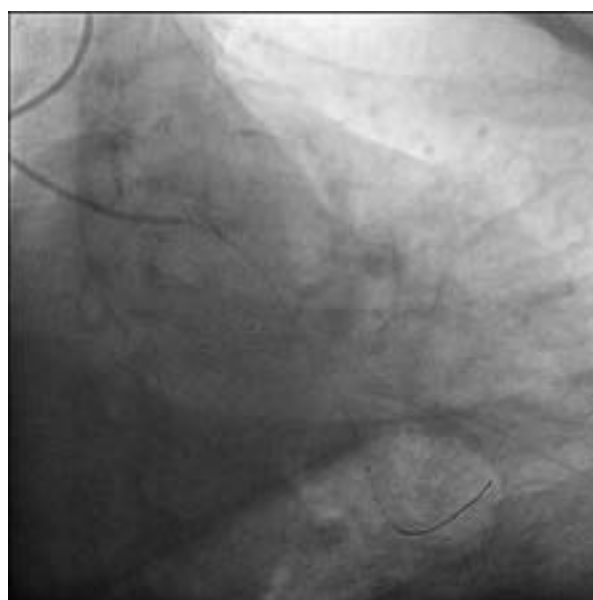


**Figure 1.** Right coronary artery arising from left coronary sinus



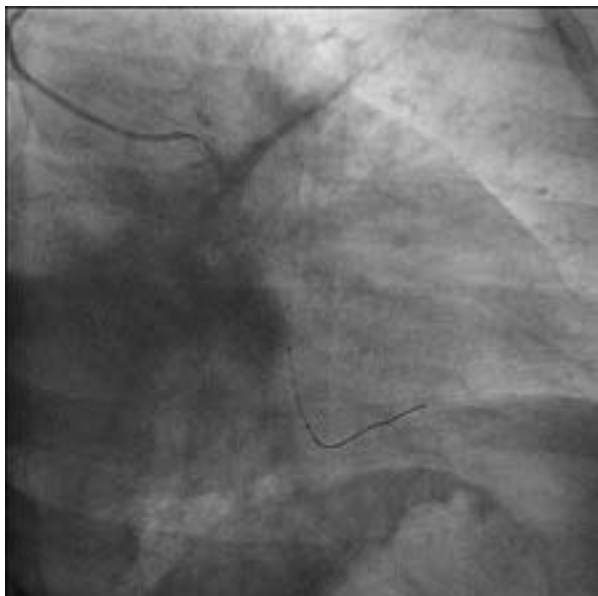
**Figure 2.** Coronary angiogram revealing abnormal take-off of left main, normal left anterior descending artery and subtotal occlusion of proximal circumflex artery (white arrow)

all unremarkable. The electrocardiogram revealed ST $\uparrow$  in lead II, III, and aVF with reciprocal changes in I and aVL. The echocardiography revealed mild hypokinesia in the left circumflex territory with ejection fraction of 48%. The patient was taken for primary PCI after proper consent. He was preloaded with prasugrel – 60 mg, aspirin – 325 mg and atorvastatin – 80 mg. Right radial artery was punctured by 21 G needle, 0.021" guide wires (Avanti transradial kit; Cordis Corp, USA) was inserted and 6-F sheath was placed. After the sheath replacement, cocktail containing 200  $\mu$ g of nitroglycerin, 2.5 mg of diltiazem, and 2500 IU of unfractionated heparin were injected. Left main artery had abnormal take-off from aorta, which required a lot of manipulation to cannulate. Coronary angiogram revealed normal left main, left anterior descending artery, right coronary artery arising from left sinus and subtotal occlusion of proximal left circumflex artery (Figure 1). Percutaneous coronary intervention was planned of the culprit artery and 7,000 U of heparin was given further. Since great difficulty was encountered while cannulating the left system, the intervention was planned through the same diagnostic catheter to cut down the time, to avoid vasospasm while multiple catheter exchange and contrast overloading. BMW guidewires 0.014", 190 cm (Abott, USA) was parked beyond the lesion and was pre-dilated with 2  $\times$  10 mm Minitrak balloon (Abott, USA) to 11 atm pressure (Figure 3). It was stented by deploying 2.75  $\times$  23 mm Xience Prime stent (Everolimus drug eluting stent, Abott, USA) up to 12 atm pressure (Figure 4) and further post dilated by 2.75  $\times$  10 mm Minitrak non-compliant balloon up to 22 atm pressure achieving TIMI 3 flow (Figure 7). His symptoms and

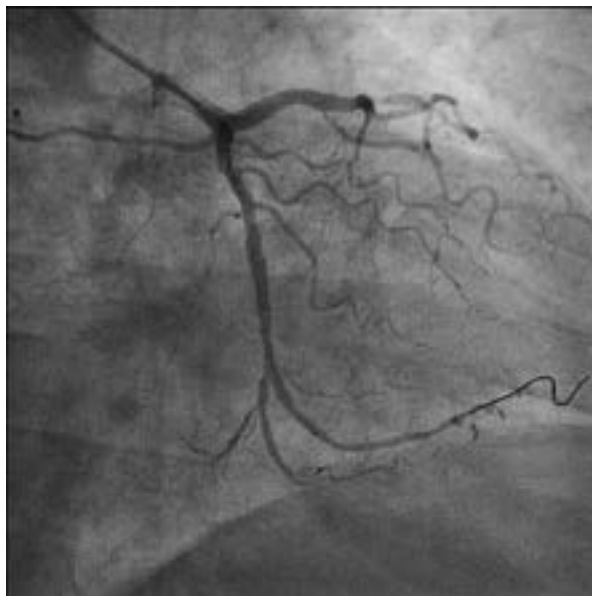


**Figure 3.** BMW guidewires 0.014", 190 cm was parked beyond the lesion in the culprit artery and lesion being pre-dilated with 2  $\times$  10 mm Minitrak balloon

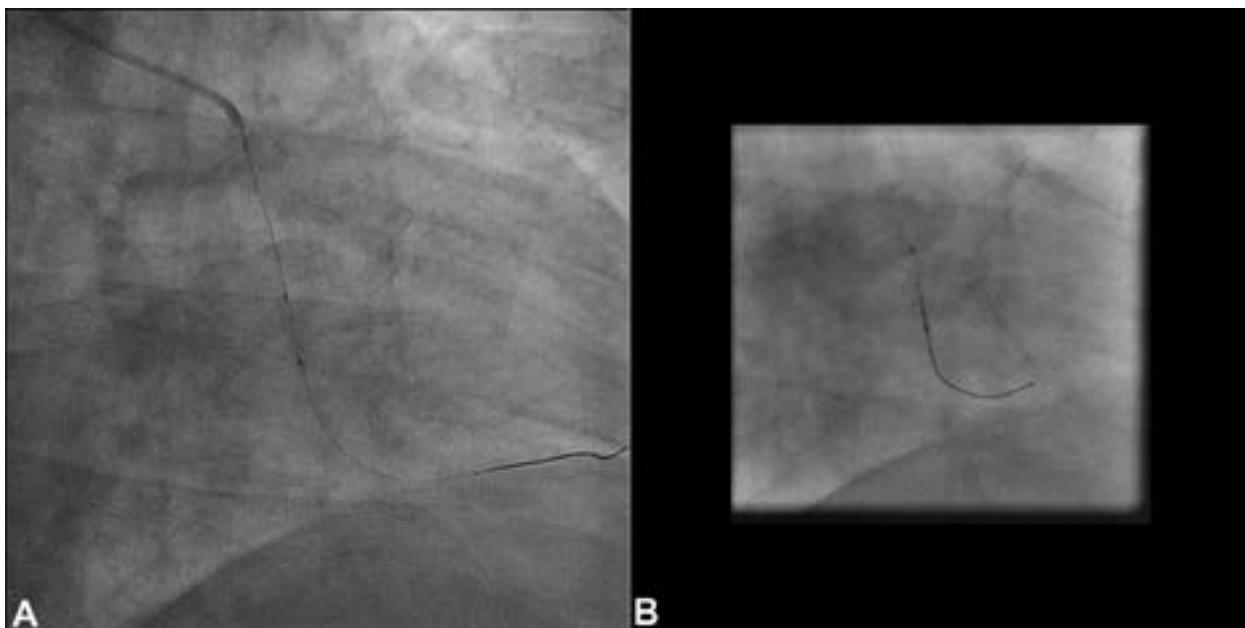
ECG stabilised. The sheath was removed and compression was performed for two hours with a radial compression device (TR band; Terumo, Inc) using the "patent haemostasis" protocol. TR band was removed after two hours of sheath removal and a light pressure bandage was applied, which was removed next day. The patient was discharged on the third day with aspirin – 150 mg/day, prasugrel – 10 mg/day, atorvastatin – 80 mg/day, metoprolol – 100 mg/day



**Figure 4.** Lesion being stented by deployment of 2.75 × 23 mm Xience Prime drug eluting stent



**Figure 5.** Post deployment of stent in culprit artery



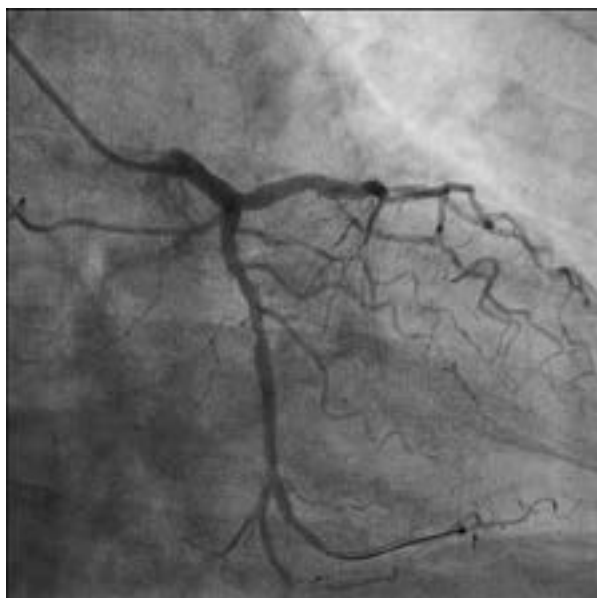
**Figure 6.** Post dilatation of stent by noncompliant balloon at higher pressure (A, B)

and ramipril – 2.5 mg/day. He is doing fine since then with regular follow-up at our institute.

### Discussion

Since the use of 5 F diagnostic catheter as a guiding catheter for PCI, as first reported by Salinger et al., [5] it is becoming increasingly popular due to the growing trends toward slender catheter for transradial approach. As time

is most vital component of primary PCI to achieve shortest possible door-to-balloon time, presence of anomalous origin, absence of complex radial loop and in presence of discrete lesion, PCI may be performed by diagnostic catheter only. It has also been noted, that guiding catheters used for PCI may sometimes not be able to selectively engage the coronary ostium even though an earlier successful cannulation with its diagnostic counterpart could be obtained, because of the slight differences in shape between the two catheters



**Figure 7.** Post-stenting left circumflex coronary artery with TIMI III flow

in form of shorter tip and lack of tip tapering for the guiding catheter, which may result in multiple guide selection attempts [6]. Another advantage is that even double vessel stenting may be performed by the same diagnostic catheter,

as reported by Khattab et al. [6]. Potential drawback with the use of 5 F catheters has been unsatisfactory vessel opacification, need for deep engagement, which may be associated with coronary dissections, and poor support for complex interventions. Nonetheless, type A lesion can easily be treated by 5 F diagnostic catheters. Issues of contrast flow may be overcome by using automatic power injectors, but this may be cumbersome and expensive undertaking [7]. We were able to achieve significantly better visualisation by using a hand held syringe connected with the usual manifold connection. This also adds to potential cost savings by cutting down the contrast volume, which has a potential to reduce the nephrotoxicity, especially in patients with renal dysfunction. We had adequate vessel opacification at all times, enabling us to accurately position and implant the stent without increasing the total radiation time or dye consumption. The sufficient support was achieved without the need for deep catheter intubation with easy positioning of the stent across the stenotic lesion. In conclusion, p-PCI via a 5 F diagnostic catheter is technically safe and feasible, and allows for significant resource savings. It may be an attractive technical alternate in selected cases.

### Conflict of interest

None.

### Streszczenie

Stosowanie mniejszych cewników do zabiegów diagnostycznych i interwencyjnych staje się coraz powszechniejsze, głównie z uwagi na to, że obecnie zabiegi te wykonuje się przede wszystkim z dostępu promieniowego. Użycie mniejszych cewników umożliwia nakłucie mniejszych tętnic, a tym samym szybsze uruchomienie i wypisanie pacjenta ze szpitala, ponieważ pozwala uniknąć konieczności stosowania urządzeń zamykających, wiąże się z podaniem mniejszej objętości środka kontrastowego, mniejszym ryzykiem nefrotoksyczności i mniejszą chorobowością. W niniejszej pracy przedstawiono przypadek chorego, u którego użyto standardowego cewnika diagnostycznego 5 F typu Tiger (*Terumo Radifocus Optitorque*, Japonia) do przeprowadzenia pierwotnej przeszłonkowej interwencji wieńcowej w obrębie gałęzi okalającej o nietypowym odejściu od pnia lewej tętnicy wieńcowej.

Słowa kluczowe: cewnik diagnostyczny typu Tiger, pierwotna przeszłonkowa interwencja wieńcowa, nietypowe odejście

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