CASE REPORT

Sheathless transradial coronary angioplasty in an achondroplastic patient with ST elevation myocardial infarction

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SUMMARY

We present a case of a 50-year-old man with achondroplasia, who presented with anterior ST segment myocardial infarction (STEMI). He was taken urgently to the catheterisation laboratory. Owing to his short stature, it was not possible to insert a radial artery sheath so he underwent a sheathless primary percutaneous coronary intervention (PCI) through the right radial artery, with no complication. He was shifted to the coronary care unit and had an uneventful hospital course. He was discharged in stable condition and follows up regularly as an outpatient.

BACKGROUND

Achondroplasia is the most common type of short-limbed dwarfism. The condition occurs in 1 in 15 000–40 000 new births. There is increased risk of heart disease in patients with achondroplasia.¹ There are no data available on coronary interventions in such patients. We report the case of an achondroplastic patient who presented with anterior ST segment myocardial infarction (STEMI) and underwent transradial sheathless coronary angiography and primary percutaneous coronary intervention (PCI). This is the first reported case of a primary PCI performed without a sheath in the radial artery of a patient with STEMI. This approach can be safely used in such patients and provides an alternative to the femoral artery route for PCI.

CASE PRESENTATION

A 59-year-old achondroplastic man with interstitial lung disease (ILD) presented to our hospital due to acute onset typical chest pain of 2 h duration. He was haemodynamically stable and not in heart failure. ECG showed evidence of anterior wall myocardial infarction (figure 1).

INVESTIGATIONS

The patient was taken to the cardiac catheterisation laboratory for coronary angiography. It was decided to proceed using a right radial artery approach for angiography due to the patient's underlying ILD and to mobilise him early. A radial artery sheath was initially introduced into the radial artery, but only went half way, as the patient had short forearms (figures 2 and 3). The sheath was subsequently taken out over the wire. Diagnostic and guiding catheters were then introduced over the wire. The right coronary artery (RCA) was engaged with a 6 Fr, 4 curve Judkins right (JR4) catheter while the left coronary artery was engaged with a VL 3.0 guide with the major portion of the catheter and guide outside the right forearm (figures 4 and 5). Angiogram showed 90% occlusion of the proximal to mid left anterior descending artery (LAD), with 60–70% stenosis of the first diagonal branch (D1), while the left circumflex and RCA were non-obstructive.

TREATMENT

The left coronary artery was engaged with a VL 3.0 guide. The LAD and D1 were wired with BMW (balance middle weight) wire. The LAD lesion was predilated with Mercury 2.0×14 mm at 6–8 atmosphere (atm). The D1 was predilated with mercury 2.0×14 mm at 4 atm. The LAD lesion was stented with Xience 2.5×38 mm (drug eluting stent) at 14 atm. The stent was then postdilated with NC Treck 3.0×15 mm at 16–22 atm (figures 6–8). thrombolysis in myocardial infarction (TIMI) III flow was achieved and a radial band was applied.

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Figure 1 ECG showing anterior wall ST segment myocardial infarction.

Figure 2 Short forearm of the patient.

Figure 3 Radial artery sheath in comparison to length of forearm.

OUTCOME AND FOLLOW-UP

The patient's postprocedure chest pain subsided and ST segment elevations resolved. He had an uneventful hospital stay and was discharged in stable condition. He is being followed regularly as an outpatient and is doing well.

Figure 4 Sheath only halfway in the radial artery.

Figure 5 Sheathless catheter in right radial artery.

DISCUSSION

Achondroplasia is caused by a mutation in fibroblast growth factor receptor 3 (FGFR3).^{2 3} In achondroplasia, the mutated form of the receptor is constitutively active and this leads to severely shortened bones.⁴

Characteristic features of achondroplasia include an average-size trunk, short arms and legs, with particularly short upper arms and thighs, limited range of motion at the elbows and an enlarged head (macrocephaly) with a prominent forehead.^{5 6} Performing coronary interventions in such patients is markedly difficult, especially through the transradial route, because of

Figure 6 Critical left anterior descending artery stenosis.

Figure 7 Left anterior descending artery and diagonal wired with BMW (balance middle weight) wire.

Figure 8 Left anterior descending artery lesion stented with thrombolysis in myocardial infarction (TIMI) III flow.

their short limbs and the angle of their elbows. There is only one reported case of coronary intervention in such a patient, which was carried out through the femoral route⁷ via a femoral artery sheath; however, there have been some case reports of coronary artery bypass grafting.⁸ This case was challenging because it was performed through the radial route in a patient with ST segment elevation myocardial infarction.

Learning points

- ▶ Sheathless radial coronary angiography can be used in achondroplastic patients, despite their short limbs.
- ▶ A radial artery approach for percutaneous coronary intervention (PCI) provides an alternative to the femoral artery route.
- ▶ A sheathless radial artery approach is safe for PCI even in patients with ST segment myocardial infarction.

Contributors All three authors were involved in the management and writing up of this article. NR performed the angioplasty and reviewed the case report. AN admitted the patient through the emergency room and wrote the case report. IG was also involved in managing the patient and edited the images.

Competing interests None declared.

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