

Percutaneous treatment of acute axillary artery occlusion after percutaneous coronary intervention

Akihiro Umeno¹ and Shigeyasu Tsuda¹

¹Affiliation not available

January 7, 2021

Abstract

The case of ischemic upper extremity disease caused by guide catheter-induced injury is rare. We present a case of right axillary artery occlusion, after percutaneous coronary intervention (PCI), treated by endovascular stent-grafting successfully.

Percutaneous treatment of acute axillary artery occlusion
after percutaneous coronary intervention: a case report

Akihiro Umeno MD, Shigeyasu Tsuda MD PhD

Division of cardiology, Kita-Harima medical center, 926-250 Ichiba-cho, Ono city, 675-1392, Japan

Address correspondence to: Shigeyasu Tsuda, MD, PhD, Division of cardiology, Kita-Harima medical center, 926-250 Ichiba-cho, Ono city, 675-1392, Japan.

Phone: +81-794-88-8800, E-mail: shigeyasutsuda@yahoo.co.jp

Keywords: JR guide catheter, catheter-induced arterial injury, endovascular treatment, self-expandable stent

Key Clinical Message

The JR guide catheter is preferred for operability; however, we should pay more attention to the guide catheter in the case of radial artery approach with severe vessel tortuosity especially in patients with older female or hypertension.

Introduction

Iatrogenic catheter-induced arterial injury may cause ischemic upper extremity disease, but such cases are rare. There are two reports on complications during transcatheter aortic valve replacement⁽¹⁾ and shoulder arthroplasty⁽²⁾, both of which were treated surgically. Transluminal angioplasty is another treatment option and shows excellent upper limb salvage for traumatic cases⁽³⁾, but reports on endovascular treatment (EVT) for iatrogenic cases are rare.

We present a case of right axillary artery occlusion, after percutaneous coronary intervention (PCI), treated by endovascular stent-grafting.

Case

An 88-year-old woman with a history of critical limb ischemia and a chief complaint of intermittent chest pain since 3 days was transported to the emergency room. ST elevation in leads III and aVF was displayed on an electrocardiogram, and laboratory data showed elevation of Troponin I (442 pg/mL). Emergency coronary angiography (CAG) through right radial artery access was performed, but her right axillary artery was so

tortuous that a 6 Fr guide catheter (Profit Plus®[?] RU) and Profit plus 6 Fr JR 4.0 got kinked in it. Therefore, we changed the right femoral artery access. CAG showed right coronary artery stenosis, and we placed two drug-eluting stents (Ultimaster 3.5 mmx15 mm, 4.0 mmx15 mm) in her stenotic lesion.

Her chest pain improved after PCI, but she complained of slight pain in her right hand during the procedure. We prescribed acetaminophen, but her symptoms did not resolve. On the next day, the patient felt numbness and exhibited impaired skilled movement in the right arm. Physical examination showed nonpalpable right radial and brachial pulses, indicating advancing ischemia. We performed three-dimensional computed tomographic angiography, which revealed an obstructive lesion from the axillary artery to the brachial artery. Therefore, we decided to perform urgent revascularization (Figure 1,2).

Procedure

A 7 Fr short sheath was placed in the right brachial artery. Angiography showed a defect from the axillary artery to the brachial artery. We attempted to penetrate the occluded lesion using a Vasallo Floppy 0.014-inch guidewire with the support of Prominent Raptor (1.8/2.6 Fr 70 cm). Initially, the approach seemed successful, but intravascular ultrasound (IVUS) showed that the wire was in the subintimal lumen. We placed a 7 Fr sheath in her left common femoral artery and passed a 0.014-inch Gladius (235 cm in length, Asahi Intecc Co., Ltd.) through the lesion using the antegrade approach. After confirmation by IVUS that the Gladius was in the true lumen, we extended the guidewire by using a 0.014-inch extension PV 165 cm in length (Asahi Intecc) and passed it through with the support of Guidezilla II PV 7 Fr from her right brachial artery. After exchanging the guidewire with Vasallo 0.014-inch SUPPORT, we placed a self-expandable stent SMART Control 6.0 mmx150 mm and performed post-dilatation with a 5.0 mmx100 mm balloon catheter (Sterling MR 150 cm) (Figure3). After the procedure, remarkable distal flow was achieved, and the procedure was terminated without any complications. Numbness and impaired skilled movement in her right arm resolved after EVT.

Discussion

In this case both Profit Plus 6 Fr RU and Profit plus 6 Fr JR 4.0 (advancing from right radial artery access) guide catheter were kinked in her tortuous right axillary artery during PCI.

Kinked catheters are thought to be the cause of artery injury that causes intramural hematoma. It has been reported that hematoma is often absorbed and dissipated spontaneously. However, in this case, the hematoma did not decrease and the true lumen was pressed upon.

It has been reported that the use of Amplatz-shaped catheters is a risk factor for catheter-induced coronary artery dissection⁽⁴⁾, but the association between the type of catheter and artery injury in the upper limb is still unclear.

The JR catheter is preferred for operability; however, severe vessel tortuosity may be complicated by axillary artery occlusion⁽⁵⁾. Arterial tortuosity is associated with older age, female sex, high blood pressure, and other cardiovascular risk factors⁽⁶⁾. For such cases, an operator should never push against resistance or cause excessive catheter torquing⁽⁷⁾. Prompt changes in arterial access should also be considered to prevent iatrogenic catheter-inducing complications.

Author Contribution

AU, ST: involved in preparing and writing the manuscript. ST: involved in the angiology. All authors approved the final version of the case report for submission to *Clinical Case Reports*.

Conflict of interest

The authors declare that there is no conflict of interest.

Acknowledgement

The authors would like to acknowledge Dr. Shinichiro Yamada and Dr. Naokazu Miyamoto for their valuable help and advice in the preparation of this report.

References

1. Kille A, Hochholzer W. Axillary Artery Occlusion after TAVR. *N Engl J Med*. 2020;382(2):179.
2. Ghanem OM, Sacco J, Heitmiller RF, Gashti SM. Delayed axillary artery occlusion after reverse Total shoulder arthroplasty. *Case Rep Orthop*. 2016;2016:5463514.
3. Waller CJ, Cogbill TH, Kallies KJ, Ramirez LD, et al. Contemporary management of subclavian and axillary artery injuries-A Western Trauma Association multicenter review. *J Trauma Acute Care Surg*. 2017;83:1023-1031.
4. Dunning DW, Kahn JK, Hawkins ET, O'Neill WW. Iatrogenic coronary artery dissections extending into and involving the aortic root. *Catheter Cardiovasc Interv*. 2000; 51(4):387-393.
5. Carlos EA, Mauricio GC. Diagnostic and guide catheter selection and manipulation for radial approach. *Interv Cardiol Clin*. 2015; 4:145-159.
6. Ciurică S, Marilucy LS, Loeys BL, et al. Arterial tortuosity: novel implications for an old phenotype. *Hypertension*. 2019; 73(5):951-960.
7. Sandoval Y, Bell, MR, Gulati R. Transradial Artery Access Complications. *Circ Cardiovasc Interv*. 2019;12(11):e007386.

Figure legends

Figure. 1 Three-dimensional computed tomographic angiography revealed an occlusion lesion from the axillary artery to the brachial artery.

Figure. 2 After the endovascular treatment distal flow was achieved.



