Novel Application of the Hemostatic Device
TOMETA KUN™

Tomohiko Sakatani, MD; Tatsuya Kawasaki, MD; Mitsuyoshi Hadase, MD; Tadaaki Kamitani, MD; Shingo Kawasaki, MD; Hiroki Sugihara, MD

A 79-year-old woman was admitted with worsening chest discomfort and diagnosed as having an acute myocardial infarction. She underwent emergency coronary angioplasty via the transradial artery, but during surgery the proximal portion of the radial artery was perforated by a wire injury. The TOMETA KUN™ compression system (Zeon Medical, Tokyo, Japan) was used for hemostasis at the perforation site and enabled an anterograde flow to be maintained in the radial and ulnar arteries without extravascular leakage. In addition to stabilizing the arterial perforation, the device allowed the successful completion of the percutaneous coronary intervention procedure without the need to cease anticoagulant therapy. (Circ J 2003; 67: 895–897)

Key Words: Arterial perforation; Percutaneous catheter intervention; TOMETA KUN™ compression system

Cardiac catheterization via a radial or brachial artery is increasingly performed because of its low invasiveness and the improved comfort of patients. The TOMETA KUN™ compression system (Zeon Medical, Tokyo, Japan) has been developed as a hemostatic device for use in diagnostic catheterization or percutaneous coronary intervention (PCI). We present a patient with acute myocardial infarction who suffered a perforation of the right radial artery during PCI, but the surgical intervention was able to be completed with the use the TOMETA KUN™ and continued anticoagulant therapy.

Case Report

A 79-year-old woman was admitted with worsening chest discomfort and diagnosed as having an acute myocardial infarction. She underwent emergency coronary angioplasty via the transradial artery, but during surgery the proximal portion of the radial artery was perforated by a wire injury. The TOMETA KUN™ compression system (Zeon Medical, Tokyo, Japan) was used for hemostasis at the perforation site and enabled an anterograde flow to be maintained in the radial and ulnar arteries without extravascular leakage. In addition to stabilizing the arterial perforation, the device allowed the successful completion of the percutaneous coronary intervention procedure without the need to cease anticoagulant therapy. (Circ J 2003; 67: 895–897)

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Fig 1. ECG on admission showing ST elevation in leads II, III and aVF.

Fig 2. Coronary angiogram on admission showing total occlusion in the proximal portion of the right coronary artery.
gram of the right radial artery from the right radial sheath revealed leakage of contrast medium from the proximal portion of the artery (Fig 3), confirming a perforation.

The TOMETA KUN™ compression system was used to stabilize the perforation and to provide pressure around the bleeding point shown on the angiogram. At this time, the patient’s blood pressure was 124/62 mmHg. The inflation pressure was set at 120 mmHg, resulting in no flow in the radial and ulnar arteries on the angiogram. The pressure was gradually decreased until finally the native anterograde flow appeared at a pressure of 50 mmHg, and there was no evidence of contrast medium leakage.

We changed the approach site from the right radial artery to the right femoral artery, and the PCI was continued without interruption to the anticoagulant therapy. A stent was implanted in the proximal portion of the right coronary artery, resulting in a good anterograde flow with no residual stenosis or distal embolism (Fig 4).

The compression of the right antebrachium was continued for approximately 8 h at a pressure of 50 mmHg, and antithrombotic therapy (aspirin, 100 mg/day and cilostazol, 200 mg/day) was continued. On the third postoperative day, an angiogram of the right radial artery via the right brachial artery showed good anterograde flow in the radial and ulnar arteries with no signs of contrast medium leakage (Fig 5). The patient recovered without developing any sequelae and was discharged.

**Discussion**

The number of transradial intervention procedures has been increasing because of the low invasiveness and the improved comfort of patients. These improvements have been achieved by the development of angioplasty equipment and hemostatic devices. Kiemeneij et al. studied 900 patients and reported that procedural and clinical outcomes of PCI were similar for transradial, transbrachial and transfemoral angioplasty. Furthermore, they showed that major vascular complications occurred less frequently during the transradial procedure. However, Lotan et al. reported that 5 of 100 patients experienced vascular complications; 3 of which were small hematomas and the others pseudoaneurysms. They warned that advancing the wire could be difficult in some cases with marked tortuosity of the radial artery, especially in elderly patients.

In Matsushita Memorial Hospital, the hemostatic device TOMETA KUN™ is generally used after a transradial or transbrachial procedure. The device consists of a clear plastic pad and a clear balloon for compression.
site but also at the perforation site in the radial artery. Conventionally, hemostasis can be achieved by compression with the cuff of a sphygmomanometer, which is quite simple, but there are some advantages to using a hemostatic device such as the TOMETA KUN™. First, it has the plastic pad for compression, which enables the compressive force to be concentrated on the perforate lesion, as well as reducing the compression in other vessels. Second, the TOMETA KUN™ compression system is smaller than the cuff of a sphygmomanometer, which may prevent congestion of the forearm, and third, device is no more complication than the cuff of a sphygmomanometer, which is reassuring for the patient.

If the bleeding had not been stopped, we would have had to cease both the anticoagulant therapy and the PCI, possibly threatening the life of the patient. The TOMETA KUN™ maintained an anterograde flow in the radial and ulnar arteries without extravascular leakage, allowing the successful completion of the PCI procedure without interrupting the anticoagulant therapy.

References