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The Usefulness of QuikClot® to Treat Femoral Puncture Sites Following Atrial Fibrillation Ablation

Kimitsu Central Hospital, Dept. of Cardiovascular Medicine
Dr. Yoshiyuki Hama

Background

The hemostasis of femoral puncture sites following atrial fibrillation ablation may sometimes require a long period of time because the patient will have been given an anti-coagulant. Also, it is comparatively common to see complications such as rebleeding or hematoma. QuikClot is a novel hemostasis device, and it is a cotton-like pad containing kaolin in order to promote blood clotting. Kaolin will promote blood clotting by activating Factor XII (Figure 1). The usefulness of QuikClot in treating femoral puncture sites following atrial fibrillation ablation has not been sufficiently investigated. We investigated the usefulness and safety of QuikClot when using QuikClot and applying manual pressure in all of the cases studied following atrial fibrillation ablation.

Method

The atrial fibrillation ablation was performed with warfarin dosing, and a single 5Fr sheath was used from the right femoral artery, with a single 8.5Fr sheath, two 8Fr sheaths and a single 5Fr sheath used from the right femoral vein. During the procedure, additional doses of heparin were administered as needed in order to maintain a level of ACT 300 ~ 350 sec. Following the ablation, the sheaths were removed and manual pressure was applied using QuikClot. The duration of the manual pressure was 5 minutes, and all of the cases were treated with intravenous drip of 30 mg of protamine. After applying manual pressure, the puncture site was immobilized with a large weight without confirming hemostasis, and the patients were asked to rest quietly for 6 hours. In order to prevent deep vein thrombosis, elastic stockings were worn. After this, the patients were allowed to move freely on their beds, and the weights were removed the following morning, at which time the presence of hematoma or false aneurysm was confirmed prior to discharge.

Results

Atrial fibrillation ablation was performed a total of 63 times on 61 patients during the period from April 2011 to November 2011 (37 cases of paroxysmal atrial fibrillation, 15 cases of persistent atrial fibrillation and 9 cases of long-term continuous atrial fibrillation). The pre-operative PT-INR was 1.92 ± 0.51 and the time of surgery was 189 ± 60 minutes. The post-operative ACT was 340 ± 74 seconds, and the post-operative blood pressure was 124 ± 26 mmHg (systolic) and 75 ± 15 mmHg (diastolic). In 1.6% of the cases (one case), rebleeding and hematoma was observed after the removal of the weight, and pressure was reapplied. In this case, the pre-operative PT-INR was 2.96. No false aneurysm, deep vein

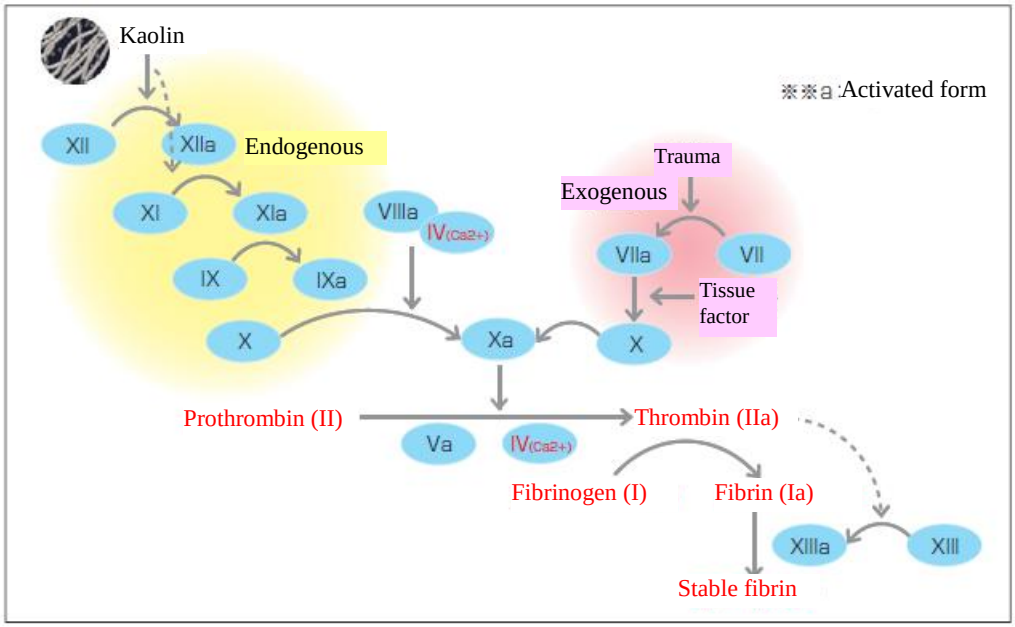

Figure 1

thrombosis, local allergic reactions or infections were observed. No post-operative complications were observed in 98.4% of the cases, and hemostasis was safely achieved.

Conclusions

As a result of using QuikClot, it was possible to safely achieve hemostasis in the puncture site in a shorter period of time. Care will be required in cases with a pre-operative PT-INR of approximately 3.

Important points on attempting hemostasis using QuikClot

There are two important points to keep in mind regarding hemostasis using QuikClot. The first point is not checking for hemostasis after applying manual pressure. If the wound is checked for hemostasis, then any fragile clots that may have formed will become dislodged, and it may be necessary to stop the bleeding again. The mechanism for hemostasis using QuikClot is believed to involve the formation of clots on the surface more rapidly than usual because of the kaolin, which gradually spread into the blood vessel, stopping the bleeding (Figure 2). Therefore, it is important to immobilize the area without performing any confirmation of hemostasis. The second point is to use a large weight, and to immobilize the area by firmly pressing down on the weight using strong adhesive tape. If a small weight is used, it may not be possible to apply firm pressure on the blood vessel puncture site in cases where the tissue is loose, such as fatty areas, and as a result, a hematoma may form. It is important to use a large weight, to immobilize the weight using four pieces of tape, and to confirm that the lateral dorsal aorta is palpable following immobilization. In some cases, a sandbag may be placed on top of the weight. It is also necessary to have the patient wear elastic stockings in order to prevent deep vein thrombosis (Figure 3-1 ~ 6).

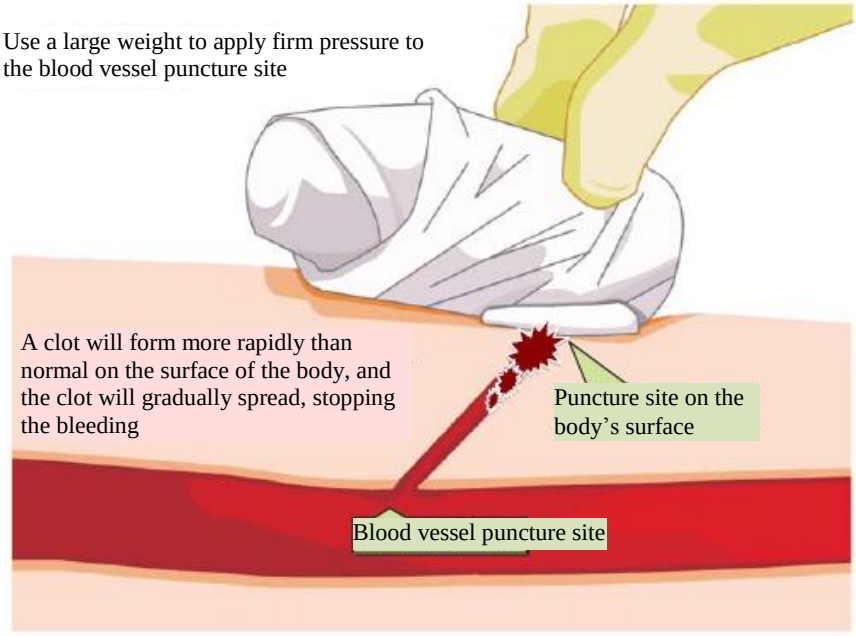

Figure 2: Mechanism of hemostasis by QuikClot

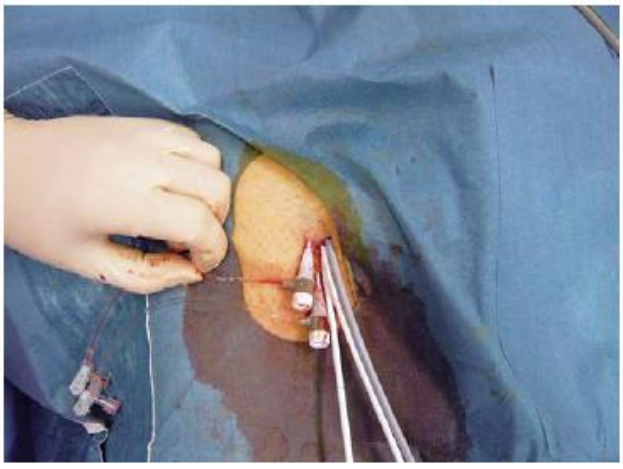

Figure 3-1

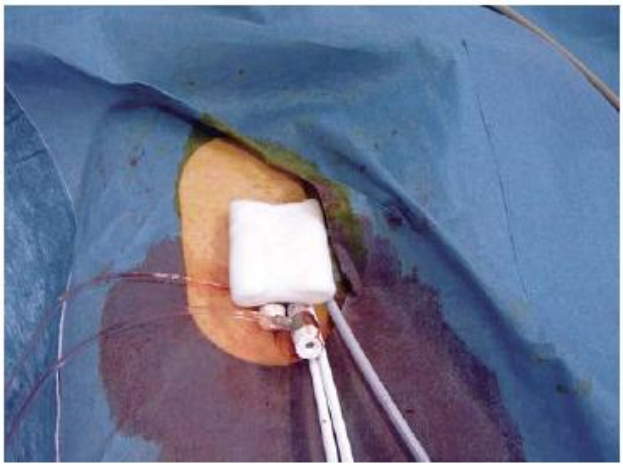

Figure 3-2

Impressions after using QuikClot

In my work, I must frequently perform punctures, ablation and hemostasis, and therefore, prior to using QuikClot, I often had to struggle a great deal for 30 minutes or even an hour at times to achieve hemostasis following atrial fibrillation ablation (the normal time for surgery is approximately 3 hours). Even after achieving hemostasis, there may be instances in which rebleeding occurs when moving the patient from the operating table to the stretcher or from the stretcher to the bed, causing significant stress on the puncture site. Also, I have been frequently disappointed by hemostasis devices in the past, and frankly, I did not have high expectations for the QuikClot either. However, I thought it would be worthwhile to give it a try if it could shorten the hemostasis time. I thought it was important to effectively use the initial clots that are formed in the site, and I also thought that rebleeding was likely if I checked for hemostasis after five minutes, so I decided to perform weight immobilization without checking for hemostasis after applying manual pressure for five minutes. I did feel some resistance to the idea of not confirming hemostasis, but when I considered the possibility of good results, I realized that it would not be possible to suffer rebleeding or hematoma simply by applying manual pressure for five minutes. As described above, it is believed that the mechanism of hemostasis by QuikClot involves the formation of clots on the surface of the body more rapidly than normal as a result of the kaolin, which gradually spread into the blood vessel, stopping the bleeding. Therefore, a hematoma may form if firm pressure is not applied to the puncture point in the blood vessel. By using a large weight and firmly immobilizing this weight using four pieces of tape, it was possible to overcome this problem. In a case with a PT-INR of approximately 3, there was rebleeding when the patient tried walking the morning following the procedure, and there was also formation of hematoma. In this case, no false aneurysm had been formed, and therefore no surgical measures were required. Manual pressure was applied once again, and the patient was discharged the following day. Currently the hematoma has been absorbed and no sequelae have been observed. After that case, the decision was made to discontinue warfarin dosing on the day prior to ablation in cases with a PT-INR of 2.7 or more at the time of hospital admission. In other types of cases, no rebleeding or hematoma is observed simply by applying manual pressure for five minutes, thereby removing a great deal of stress regarding the puncture site. I believe that hemostasis following atrial fibrillation ablation is a source of stress for many medical practitioners. QuikClot is a superior device that can ensure trouble-free hemostasis simply by applying pressure for five minutes as long as the points I noted above are followed. I highly recommend using the device at least once.

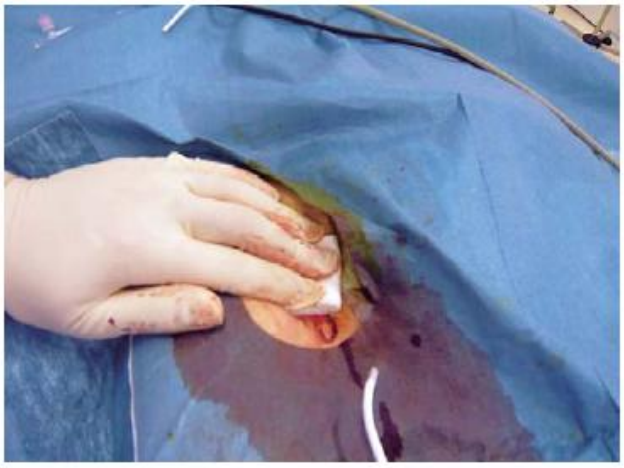

Figure 3-3: Applying pressure for 5 minutes

Figure 3-4: Large weight

Figure 3-5: Firm immobilization

Figure 3-6: Preventing deep vein thrombosis

PRODUCT NEWS

QuikClot® Cotton-like kaolin-containing hemostatic pads

QuikClot Kaolin seal (product code: QC-QIR)

Supporting astriction of puncture sites
Experience the effects of hemostasis for yourself

(Features)

- The pads contain kaolin.
- The cotton-like kaolin-containing pads will contribute to hemostasis by absorbing blood.
- It will be possible to achieve hemostasis of puncture sites up to 12Fr without requiring the use of any special techniques.

(Specifications)

Dimensions	3.8 cm × 3.8 cm
Indications	Sheath diameters of 12Fr or less in the puncture site
Expiration date	2 years
Quantity	10 bags / box

* Kaolin (kaolinite) is
a hydrous silicate of aluminum, and it is a type of clay mineral.
The name kaolinite is derived from Kaoling in the Jiangxi province of China, which is famous for clay production. The clay produced in Kaoling is famous as the material used in the porcelain made in Jingdezhen, and clay (mineral) with the same properties is called kaolin.
This product uses kaolin that was produced in the USA.
It is known that there will be promotion of blood clotting if blood is exposed to a glass-based (silicate) material.

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Nihon Kohden Co., Ltd. 1-31-4 Nishi-Ochiai, Shinjuku-ku, Tokyo 161-8560
Telephone 03 (5996) 8000 (switchboard) Fax 03 (5996) 8091

http://www.nihonkohden.co.jp/