

## A simple technique for the management of bleeding from axillary cannulation site

*Aksiller kanülasyon bölgesindeki kanamanın kontrolü için basit bir teknik*

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A simple technique for the management of bleeding from the axillary cannulation site is described. We present this technique due to the fact that bleeding usually occurs in side-arm graft technique from axillary artery cannulation site during cardiopulmonary bypass in aortic surgery patients.

**Key words:** Aortic surgery; axillary cannulation; bleeding; cardiopulmonary bypass.

The use of an axillary artery for arterial cannulation during cardiac surgery for surgical procedures such as aortic dissections, reoperations, arch surgery, and extensively diseased ascending aortas has been reported in the literature.<sup>[1]</sup> However, direct cannulation of the artery may compromise arm perfusion during surgery.<sup>[2]</sup> Therefore, some centers prefer an end-to-side anastomosis of a prosthetic graft to the axillary artery in the arm for axillary cannulation.

However, this method occasionally has the problem of bleeding from the suture line<sup>[3]</sup> or graft sweating during cardiopulmonary bypass (CPB). Nevertheless, this simple technique eliminates blood loss and keeps the spilled blood away from the surrounding surfaces.

### **SURGICAL TECHNIQUE**

To perform this technique, the axillary artery is dissected (Figure 1) and prepared for cannulation using the side graft method as has been previously described.<sup>[4]</sup> Then an 8 or 10 mm prosthetic graft is

Aksiller kanülasyon bölgesindeki kanamanın kontrolü için basit bir teknik tanımlandı. Bu teknik, aort cerrahisi hastalarında kardiyopulmoner baypas sırasında aksiller kanülasyonun yan kol greft tekniği yardımı ile yapıldığı zaman kanama görülebileceği gerçeği nedeniyle sunuldu.

**Anahtar sözcükler:** Aort cerrahisi; aksiller kanülasyon; kanama; kardiyopulmoner baypas.

anastomosed to the axillary artery in an end-to-side fashion (Figure 2). At this stage, it is critical to use a graft with minimum length to leave all synthetic graft inside the axillary groove at the end-to-side anastomosis. Next, an intracardiac/pericardial sump, which is attached to a cell saver system, is inserted into the groove (Figure 3), and with the graft and sucker tip inside, only the skin of the incision is closed with continuous sutures to create a closed space. This allows for the sucker to empty the space into the attached cell saver system (Figure 4). A gauze sponge or hemostatic agent, such as Surgicel (Ethicon, Inc., a Johnson & Johnson Company, Somerville, New Jersey, USA), is left inside the pocket, and the surgeon then checks the arterial line resistance with the perfusionist before starting the CPB.

### **DISCUSSION**

Although there is occasionally much more bleeding than expected from the axillary cannulation site, it

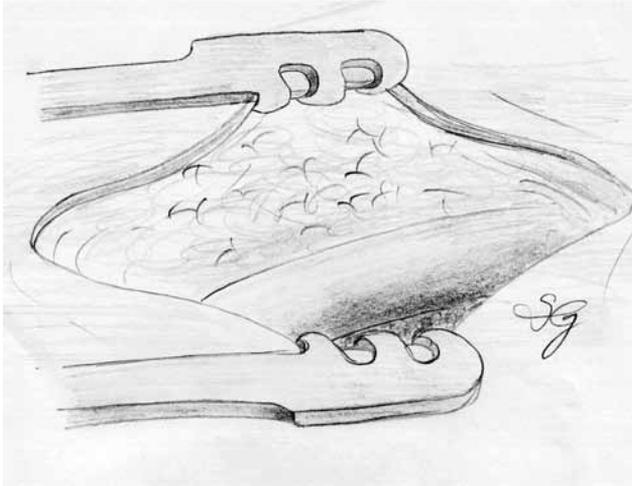


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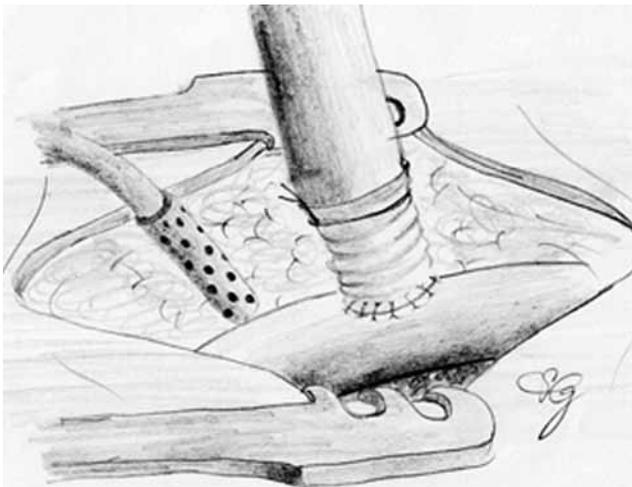
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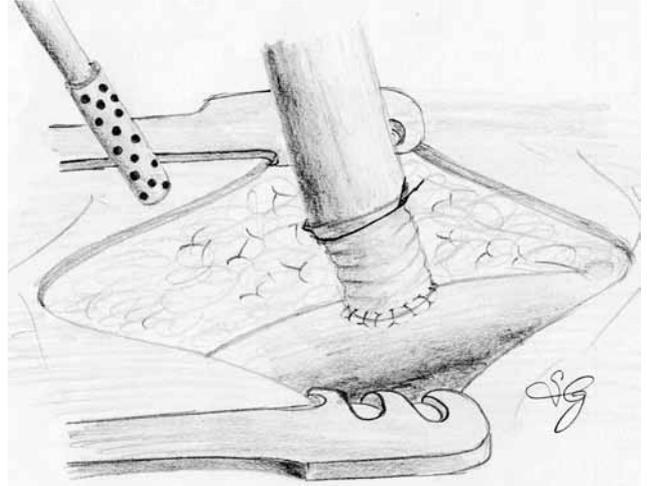
**Figure 1.** The axillary artery is exposed through a 6 to 8 cm incision below and parallel to the lateral two thirds of the clavicle.

is usually ignored. This bleeding occurs as a result of the heparinization and cooling of the patient. Graft sweating is another cause of the bleeding. Additionally, the mobility of the side graft sometimes leads to blood loss from the suture line. We have performed 22 operations of this type, and the average blood loss from the axillary groove as measured by the cell saver was  $248 \pm 141$  mL (range; 45-600 mL) in these operations.

The axillary cannulation via end-to-side anastomosis of a prosthetic graft to the axillary artery has several advantages. First, since the prosthetic

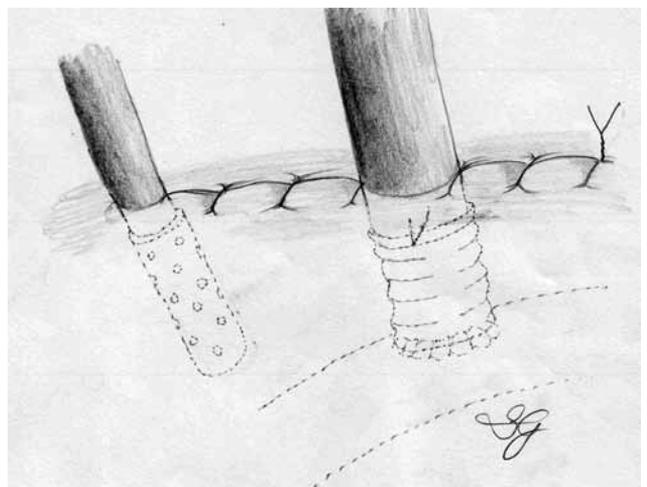


**Figure 3.** The intracardiac/pericardial sump is inserted into the groove. A gauze sponge or hemostatic agent can be used to cover the cannula and the suction tip.



**Figure 2.** When the end-to side anastomosis is sewn, the prosthetic part of the cannula graft must stay inside the groove. Afterwards, an intracardiac/pericardial sump is inserted into the groove.

material is inside the groove, this method eliminates the blood loss from the anastomosis leakage and/or the prosthetic graft sweating by sucking up the blood. Another advantage is that the leaking blood can be saved by the cell saver. Furthermore, the surgeon can monitor the amount of blood loss, which is often surprising, and the cell saver tubing can be transferred from the axillary groove to the pericardium and used as a sucker system during the controlled bleeding that takes place after the administration of protamine.



**Figure 4.** Finally, the groove is closed with continuous sutures to achieve a closed pocket. A final check of the resistance of the arterial cannula must be done in order to avoid external pressure to the axillary artery and the small portion of the prosthetic graft material.

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