

Chapter 30

Axillo-Femoral Bypass



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Anatomy

The axillary artery consists of three parts. The first portion is distal to the lateral border of the first rib to the medial edge of the pectoralis minor. The superior thoracic artery arises in this section. The second portion is under the pectoralis minor. The first branch is the thoracoacromial trunk which divides into the acromial artery, pectoral artery, clavicular artery, and deltoid artery. The second branch is the lateral thoracic artery. The third portion of the artery is from the lateral edge of the pectoralis minor to the lateral border of teres minor. There are three branches which are the subscapular artery, anterior humeral circumflex artery, and posterior humeral circumflex artery. The vein lays medial to the artery.

Indications

1. Hostile abdomen
2. Abdominal infection
3. Poor surgical candidate due to comorbidities

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Procedure

The donor arm is abducted 90 degrees and a towel roll is placed under the patient. A 10–12 cm transverse incision about one finger breath below the middle third of the clavicle is made (from the costosternal junction to the deltopectoral groove). Incise the pectoralis major fascia along the direction of its fibers. Usually the medial portion of the pectoralis minor muscle is divided to help mobilize the axillary artery or the muscle is retracted laterally. The axillary vein is anterior and caudal to the artery and may need to be isolated to improve exposure of the artery. Avoid injury to the cords of the brachial plexus that lay superior and posterior to the artery. Dissect out 4–5 cm of the axillary artery. Next an incision is made in the groin, and the common femoral, profunda, and superficial femoral artery is mobilized. The proximal graft is generally under the pectoralis minor muscle but can be placed on the anterior surface. A subpectoral muscle is created parallel to the axillary artery and continued in a subcutaneous plane in the axilla. The tunnel continues distally along the anterior axillary line and will gently curve at the level of the anterior superior iliac spine towards the groin. A counter incision made below the costal margin will help with tunneling. Next, an 8 mm-ringed PTFE is passed through the tunnel. If a femoral-femoral crossover graft is planned, the tunnel should be created next. A prefabricated graft for an axillobifemoral bypass can be used for this. Be sure to allow slight redundancy to the axillary tunnel to avoid avulsion with extreme arm abduction. Anticoagulate with heparin to achieve an ACT >250. An arteriotomy is made on the anterior inferior surface of the axillary artery, and an end-to-side anastomosis is sewn using 5-0 prolene. The bevel can be made in the traditional 30-degree angle or in cobrahead fashion. Prior to completion of the anastomosis, the artery is forward and back bled. Next create an arteriotomy on the common femoral artery which should be extended onto the profunda or superficial femoral artery. An end-to-side anastomosis is then sewn using 5-0 prolene. Prior to completion of the anastomosis, the artery is forward and back bled as well as the graft. See Chap. 29 for more information regarding femoral-femoral bypass.

Diagrams of the Procedure

Image showing “Proximal anastomosis of axillo-femoral bypass with two types of configuration” Fig. 30.1.

Figure 30.1a: 30° bevel

Figure 30.1b: Cobrahead bevel

Image showing “Course of tunnel for an axillobifemoral bypass,” (see Fig. 30.2a).

Image showing “Details of femoral anastomosis,” (see Fig. 30.2b).

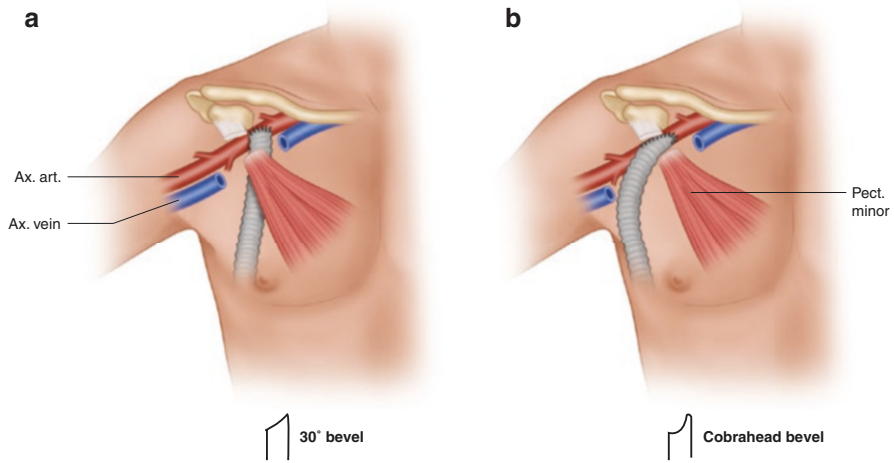
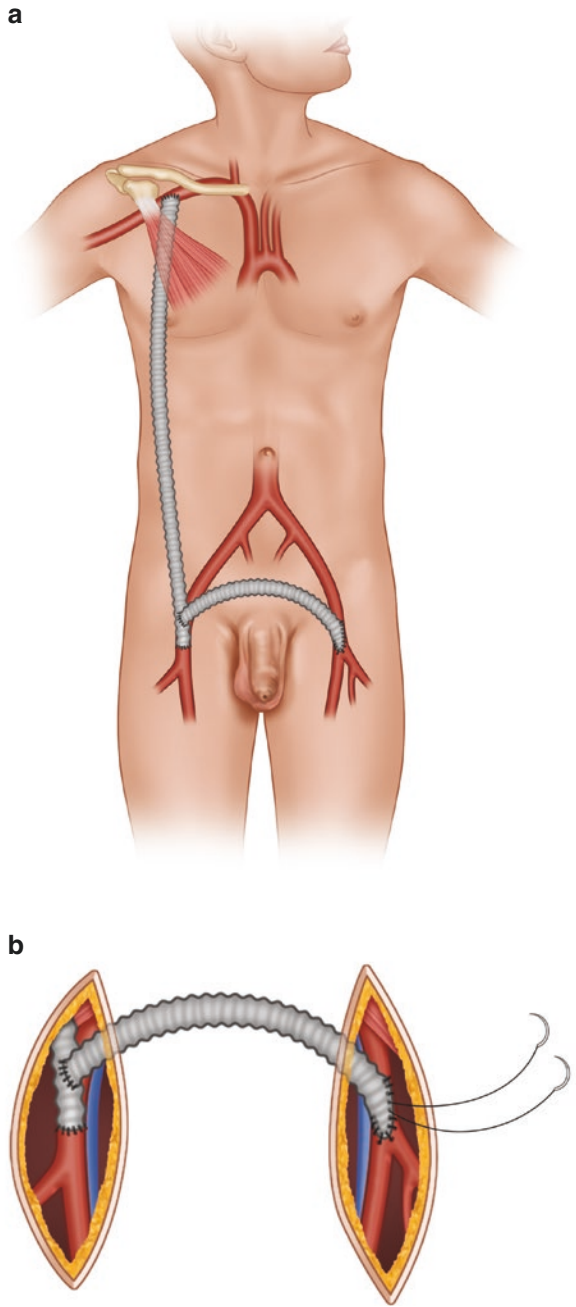


Fig. 30.1 Proximal anastomosis of axillo-femoral bypass graft – two types of configurations

Fig. 30.2 (a) Course of tunnel for axillofemoral graft. (b) Details of femoral anastomosis



Pearls and Complications

1. To avoid avulsion or excessive tension with extreme arm abduction, be sure to leave a small amount of redundancy in the graft.
2. Either axillary artery can be used if there is no disease in the subclavian/axillary artery, but the right side is preferred if a left flank incision will be utilized in a future procedure.
3. If both axillary arteries are equal, inflow is usually the same side as the worst leg.
4. If there is a systolic pressure difference in the arms that is greater than 10 mmHg, choose the arm with the higher pressure.
5. The axillary artery is fragile – avoid excess tension when sewing the anastomosis.