

## 21. SAPHENOUS NERVE BLOCK

### INTRODUCTION

The saphenous nerve is the only nerve below the knee that is not derived from the sciatic nerve. Rather, it is a continuation of the femoral nerve (part of the lumbar plexus) extending the length of the lower extremity. It provides cutaneous innervation over the medial, anteromedial, and posteromedial areas of the lower leg; all other sensory and motor innervation to the lower leg is supplied by the sciatic nerve. Because it is a terminal branch of the femoral nerve, the saphenous nerve can be anesthetized with a lumbar plexus nerve block, or more commonly, a femoral nerve block. This nerve can also be individually blocked directly at the knee or the ankle (see Chapter 22, Ankle Block). The saphenous nerve block is frequently combined with a sciatic nerve block to anesthetize the entire lower leg.

### ANATOMY

The saphenous nerve is the largest sensory branch of the femoral nerve, derived from the L3–4 nerve roots. Its cutaneous area of innervation spans from the medial lower leg just distal to the knee down to the medial malleolus, and in some patients as far down as the great toe (Figure 21-1). The nerve travels through the femoral triangle, lateral to the vessels, and then takes a more superficial path between the sartorius and gracilis muscles (Figure 21-2). Once past the knee, it proceeds caudally along the medial aspect of the leg, traveling with the great saphenous vein. The nerve is usually targeted to be anesthetized at the medial aspect of the knee.

Several different techniques of saphenous nerve block have been described, the most common being the transsartorial approach, which takes advantage of the nerve's location behind the sarto-

rius muscle (Figure 21-3). Another technique is the paravenous approach, which takes advantage of the nerve's proximity to the saphenous vein, and a third is the simple field block, in which local anesthetic is deposited subcutaneously around the medial surface of the tibia. Recently, ultrasound-guided saphenous nerve blocks have been described that use the saphenous vein as an ultrasound landmark.

**Teaching Point.** If a tourniquet will be used for the surgical procedure, its placement either above or below the knee must first be determined. For above-knee placement, a femoral nerve block is more appropriate to provide analgesia accommodating the tourniquet; for below-knee tourniquet placement, a saphenous nerve block is appropriate.

Figure 21-1

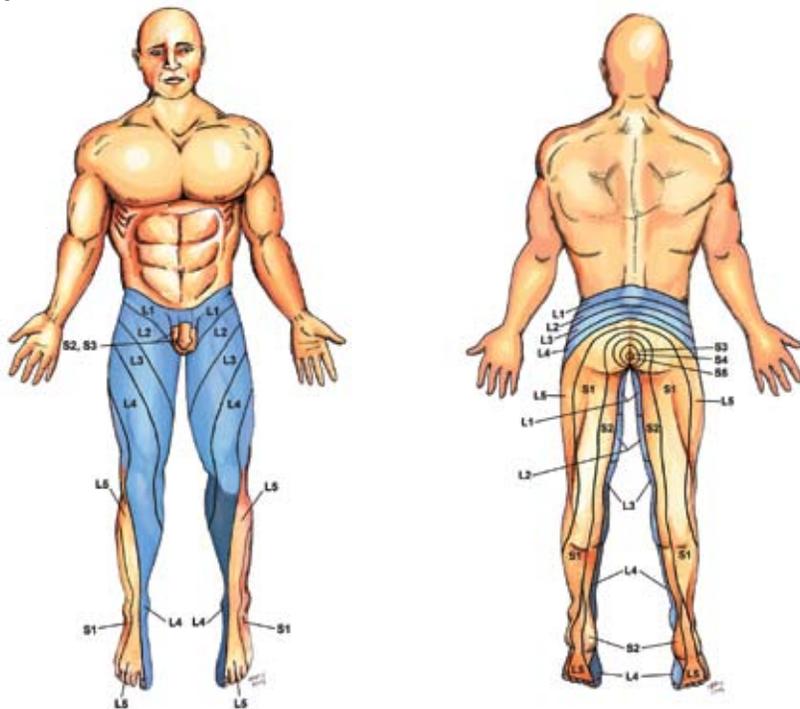
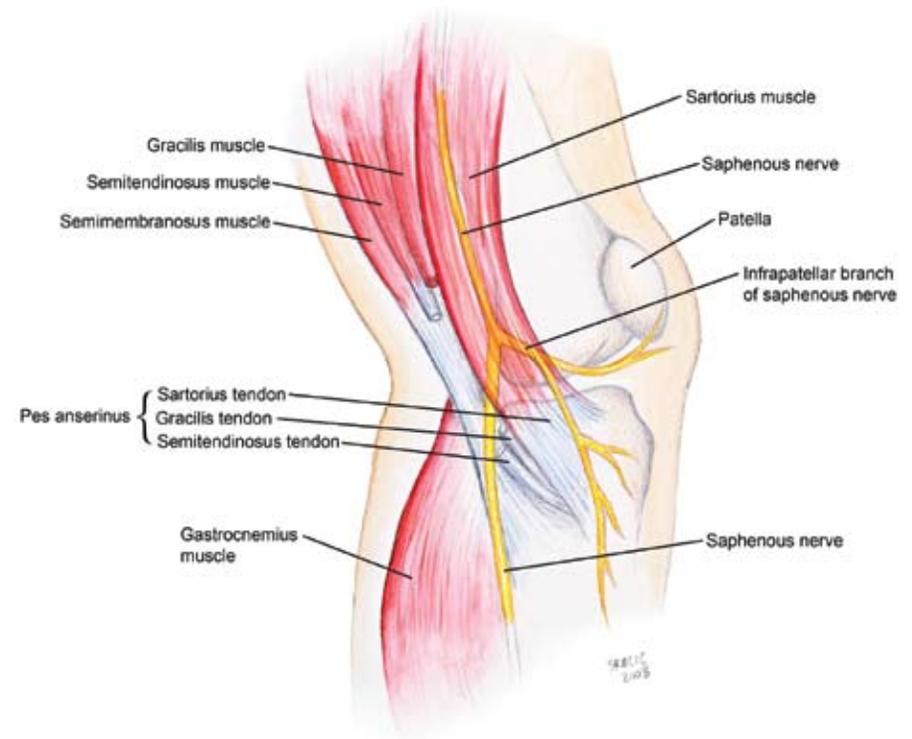


Figure 21-2



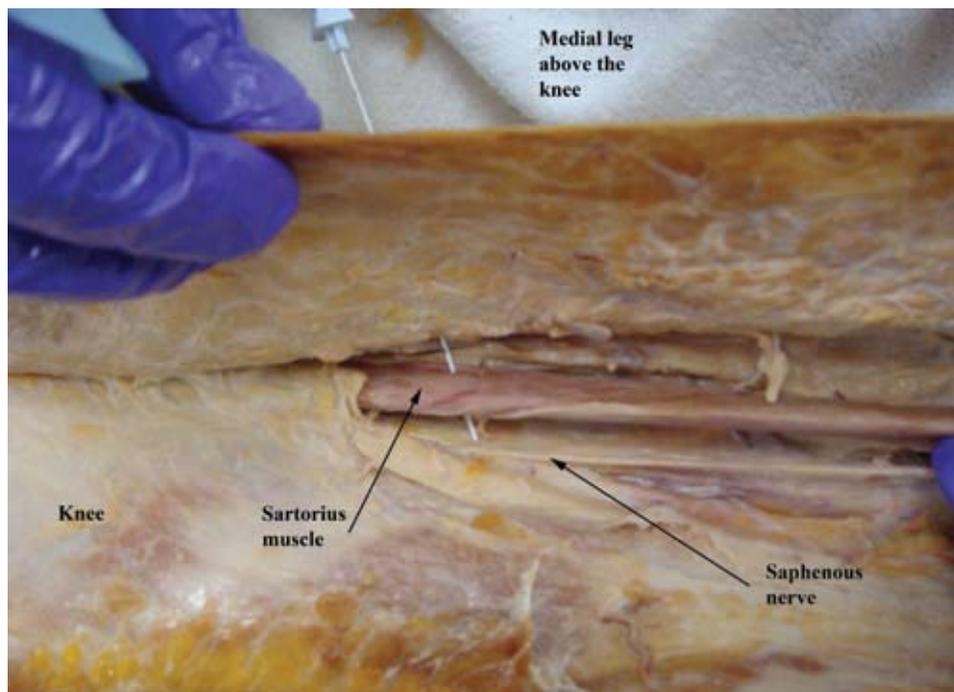


Figure 21-3



Figure 21-4

## PROCEDURE

**Transsartorial Approach.** With the patient in the supine position and the leg extended and actively elevated 2 inches above the bed, the sartorius muscle is easily identified on the medial aspect of the leg, just above the knee. Insert the needle 1 to 2 cm above the patella, slightly posterior and caudad to the coronal plane, and pass it through the body of the sartorius muscle (Figure 21-4). Once a loss of resistance is appreciated (subsartorial adipose), perform gentle aspiration, and deposit 10 mL of local anesthetic. The distance from skin to loss of resistance is typically 1.5 to 3.0 cm.

**Paravenous Approach.** At the level of the tibial tuberosity, the saphenous nerve lies medial and

posterior to the vein. Place a tourniquet around the leg based on this anatomic relationship, and then place the leg over the side of the bed for 1 minute to allow time for the saphenous vein to become identifiable. Once the vein is either viewed or palpated along the medial aspect of the leg, deposit 5 mL of local anesthetic in the subcutaneous tissue on either side of the vein, just below the patella.

**Below-Knee Field Block Approach.** This approach is similar to the paravenous approach but encompasses a wider area. With the patient in the supine position, identify and palpate the tibial tuberosity (a bony prominence several centimeters distal to the patella). Inject 5 to 10 mL of local anesthetic into the subcutaneous tissue, beginning at the medial aspect

of the tibial tuberosity and ending at the medial aspect of the calf (gastrocnemius muscle).

**Local Anesthetic.** In most adults, 35 to 45 mL of local anesthetic is sufficient to block the nerves.

**Teaching Point.** Because the saphenous nerve has many smaller branches, it is often difficult to anesthetize the entire nerve at a single location at or distal to the knee. If the operative field will include the medial aspect of the lower leg, a femoral nerve block is recommended.