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Clinical Anatomy and Recipient Vessel Selection in the Chest, Abdomen, Groin, and Back

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INTRODUCTION

Reconstruction of the torso is a broad topic, which in and of itself includes techniques of local tissue rearrangement, skin grafting, local and regional flaps, as well as complex microsurgical reconstruction. The defects to be reconstructed are equally diverse and can include breast reconstruction, wounds related to spinal surgery, cardiothoracic surgery, abdominal wall reconstruction, or inguinal vessel exposure. The majority of these techniques are addressed in specific chapters throughout this book; however, the purpose of this chapter is to approach the torso in a broad manner, specifically addressing the anatomic considerations of muscle, vessel, nerve and lymphatic anatomy, which play a significant role in the understanding of torso reconstruction as a whole.

MUSCULAR ANATOMY BY REGION

THE CHEST

The workhorse muscle of the thorax is the pectoralis major. It has a dual origin from both the clavicle and the sternum and inserts on the intertubercular groove of the lateral humerus. Owing to its predictable, dual blood supply through the thoracoacromial and internal mammary perforators, as well as its broad surface area, the pectoralis major can be useful in many forms of reconstruction. The pectoralis minor sits under its major counterpart and is much more diminutive in nature (Figs 11.1, 11.2).

The serratus anterior originates from the lateral, anterior surfaces of ribs 1 through 8 and inserts on to the anterior surface of the medial border of the scapula. Injury to its innervation, the long thoracic nerve, results in "winging" or protrusion of the scapula off of the chest wall. Elevation of the anterolateral origins of the muscle is very useful in inferolateral muscular coverage of an expander for breast reconstruction.

The intercostal muscles are comprised of the external intercostal, internal intercostal, and innermost intercostal, stacked on top of one another from superficial to deep. Their membranous coverings are each synonymous with, and contiguous with, the corollary muscle of the abdominal wall. These muscles are intimately involved in respiration.

THE ABDOMEN

The rectus abdominis is a vertically oriented, paired muscle of the anterior abdominal wall. The pair is separated in the midline by a dense fibrous line called the "linea alba." The pair originates on the costal margin bilaterally and inserts on the symphysis pubis. The lateral abdominal wall is comprised of three muscles, the external oblique, internal oblique and transversus abdominis. The external oblique is the largest and most superficial of the three with fibers oriented in a superolateral to inferomedial direction. It originates on the external surfaces of the 5th through 12th ribs and inserts on the linea alba, pubic tubercle and iliac crest. The inferior edge is rolled over on itself and makes the inguinal ligament. The internal oblique is deeper and more vertically oriented with an origin on the thoracolumbar fascia, iliac crest, and inguinal ligament with an insertion on the inferior border of the 10th through 12th ribs. The transversus abdominis is the deepest of the three with a transverse orientation as the name would suggest. It originates laterally on the thoracolumbar fascia, inguinal ligament and iliac crest and inserts on the linea alba.

The rectus sheath is a strong fibrous layer surrounding the rectus abdominis muscles. It is a fusion of the aponeuroses of the three lateral muscles. For the majority of the sheath, the posterior sheath is comprised of the transversus abdominis and half of the internal oblique. The anterior sheath is comprised of half of the internal oblique and the entire external oblique. That is to say that the internal oblique bifurcates anterior and posterior to the rectus abdominis muscles and all three merge in the midline to form the linea alba. Midway between the umbilicus and pubic symphysis however, is the arcuate line. Below this line, the aponeurosis of all three muscles passes anterior to the rectus muscles. Thus, there is no posterior rectus sheath below the arcuate line.

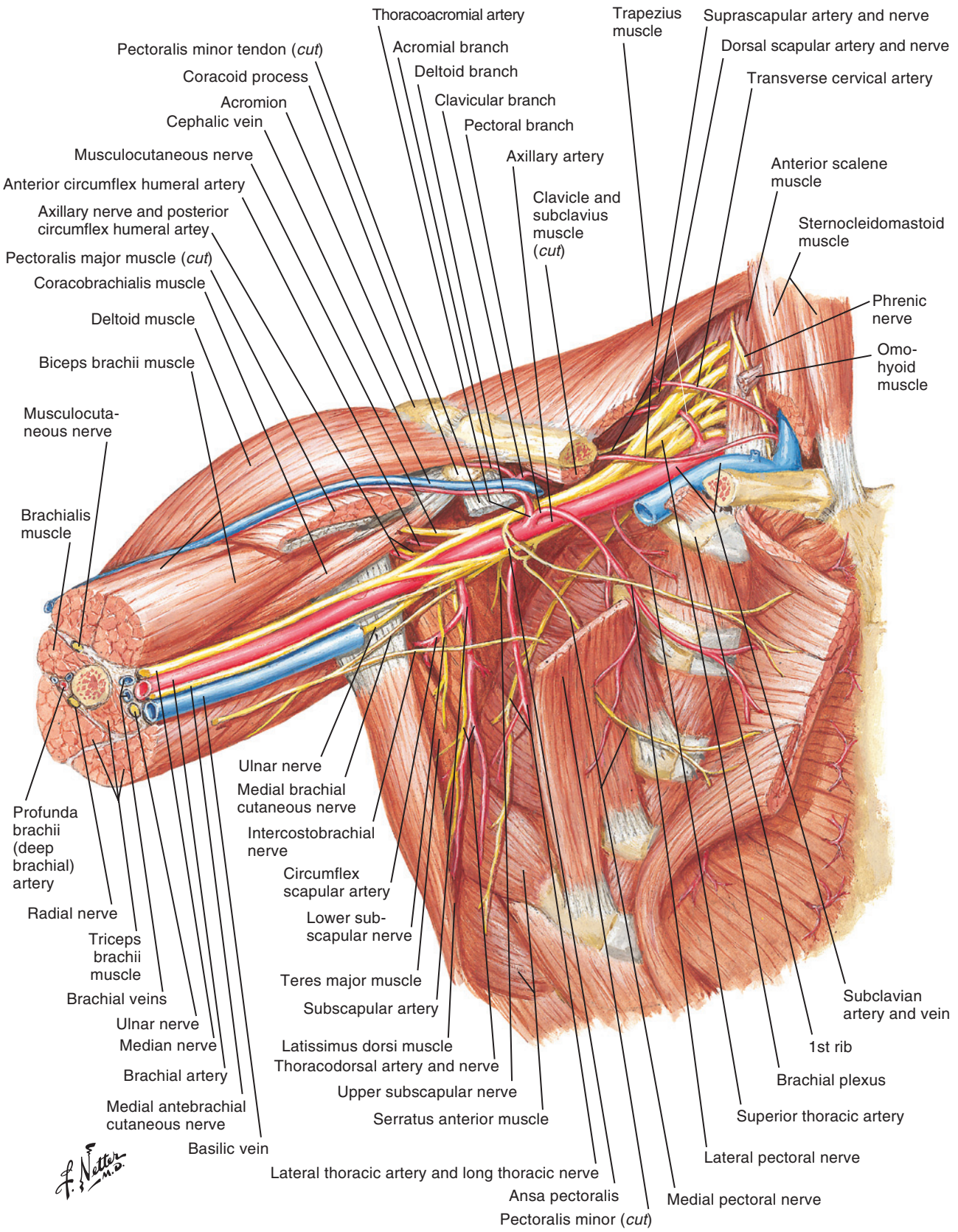

Figure 11.1 Axilla (dissection): anterior view. (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)