inserts along the intertubercular groove of the humerus. Innervated by the thoracodorsal nerve, this muscle is the main actor for adduction and medial rotation of the humerus, as well as shoulder extension. With arm extension, this muscle is the primary driver to lift the torso while climbing.

Additional players of shoulder motion include the levator scapulae, rhomboid major and rhomboid minor. All three originate along the spine and insert along the medial border of the scapulae to aid in scapular stability, retraction and elevation (Fig. 11.4).

The paraspinous muscles are a group of muscles including but not limited to the spinalis, longissimus and iliocostalis which aid in spinal extension and stability. These long muscles located adjacent to the spinous processes of the spinal column are useful in spinal hardware coverage.

ARTERIAL ANATOMY BY REGION

THE CHEST

The most commonly used arteries for chest reconstruction include the thoracodorsal, thoracoacromial, and internal mammary systems (see Figs 11.3, 16.1, 16.2, 16.4). Less commonly used arteries include the circumflex scapular, the lateral thoracic (Fig. 11.1), and a perforating artery of the internal mammary. The thoracodorsal system is used most commonly in pedicled reconstruction using the latissimus dorsi muscle or myocutaneous flap. The thoracoacromial or internal mammary arteries are useful for pedicled pectoralis major advancement or turnover muscle flaps. While all of these arteries are useful in regional reconstruction, the

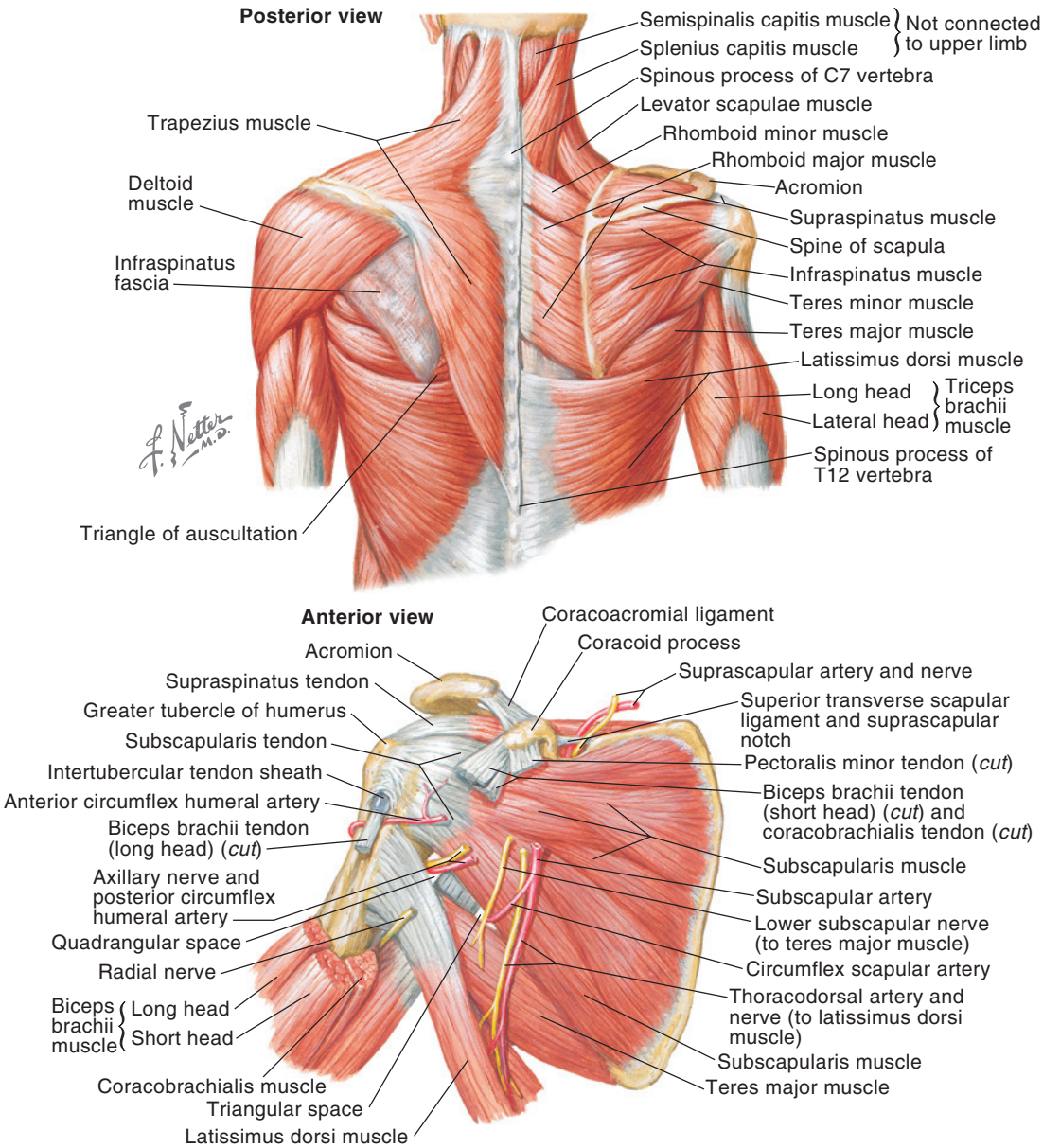

Figure 11.4 Muscles: back and scapula region. (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)

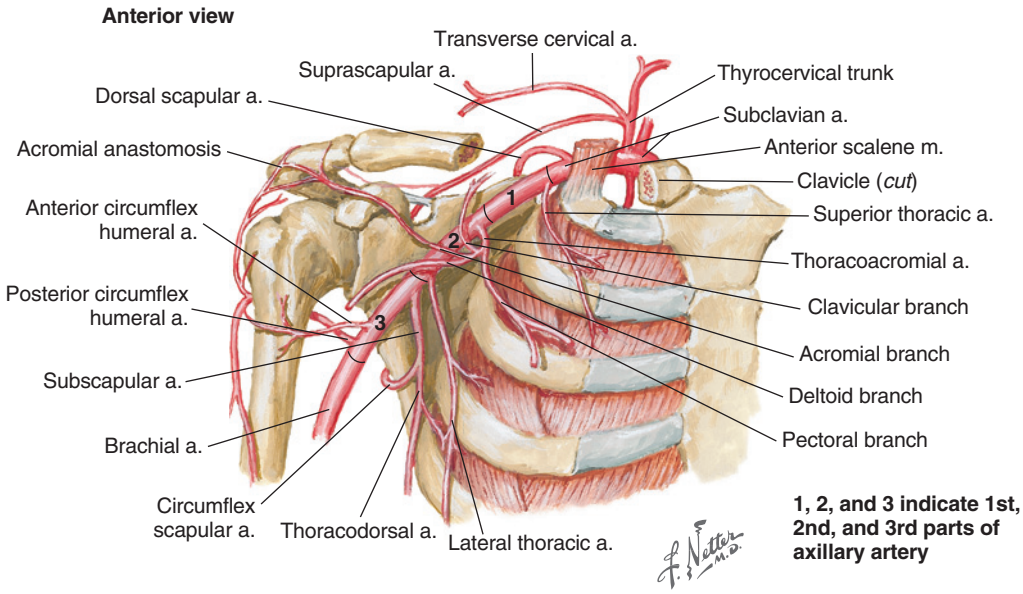

Figure 11.5 Axilla: branches of the axillary artery. (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)

thoracodorsal and internal mammary arteries are the most useful as recipient vessels in microsurgical cases.

THE ANATOMY AND EXPOSURE OF THE SUBSCAPULAR SYSTEM

The subscapular system begins as a short artery arising from the axillary artery, which divides into the thoracodorsal and circumflex scapular arteries. The thoracodorsal artery continues for 2–3 cm before it gives off one or two branches to the serratus muscle. For free tissue transfer, these serratus branches or the terminal branches of the thoracodorsal artery can be used when the donor pedicle artery is of a smaller caliber. The circumflex scapular courses laterally as it originates from the subscapular artery (Figs 11.1, 11.4, and 11.5) and passes through the triangular space to become a cutaneous artery that supplies the scapular and parascapular fasciocutaneous flaps.

If an axillary dissection has been part of the surgery that has immediately created the chest defect, the thoracodorsal vessels are usually exposed and require little additional dissection to prepare them as recipient vessels. In this setting, the thoracodorsal nerve usually crosses anterior to the artery and vein. This nerve should be dissected off the vessels and the vessels dissected from several small branches so as to free the thoracodorsals from their origin to the first or second serratus branch. In addition, the vein should be separated from the artery for several centimeters as well. If the axilla has not been dissected as part of the immediate defect, the thoracodorsal vessels are approached through a transverse incision between the anterior and posterior axillary folds. The level of the incision is just below the lower limit of the axillary hair.

The lateral border of the pectoralis muscle is defined and the axillary fat is entered directly posterior to this border of the muscle. The lateral thoracic vein is usually first encountered within the axillary fat and this vein can be traced superiorly to identify the axillary vein. Spreading the axillary fat just posterior to the origin of the lateral thoracic vein usually reveals the proximal portion of the thoracodorsal vessels and nerve. The axillary fat is usually easily dissected off these vessels. Self-retaining retractors are helpful in holding back the axillary fat so that these vessels can be dissected and prepared. There is usually a single perforating branch to the axillary fat at the proximal portion of the thoracodorsal vessels. This branch should be ligated before separating the thoracodorsal vessels from the axillary fat. With proper retraction, it is unnecessary to remove any of the axillary lymphatics in preparing these recipient vessels.

If the axilla has been previously dissected, the thoracodorsal vessels may still be usable as recipient vessels. The skin incision is made as above. The lower portion of the latissimus muscle border is defined by separating the lateral chest skin off the chest wall musculature, well below the axillary vessels. With the lower lateral border of the latissimus defined, the vessels are identified as they enter the muscle and then traced proximally. This allows for safe dissection up to the proximal thoracodorsal vessels as well as the axillary vein and thoracodorsal nerve.

The circumflex scapular vessels lie just posterior to the origin of the thoracodorsal vessels and then travel laterally just below the inferior border of the axillary vein toward the triangular space. Small branches coming off these vessels are divided and the distal ends of the artery and vein can be divided near the triangular space. This allows for rotation of these circumflex scapular vessels medially and anteriorly, so as to make them useful as recipient vessels within the axilla. If the thoracodorsal vessels are found to be not useful as a result of previous axillary dissection, the circumflex scapular vessels should be examined since they are not usually injured by previous axillary surgery.

THE ANATOMY AND EXPOSURE OF THE INTERNAL MAMMARY ARTERY

The internal mammary artery originates from the corresponding brachiocephalic or subclavian artery and courses