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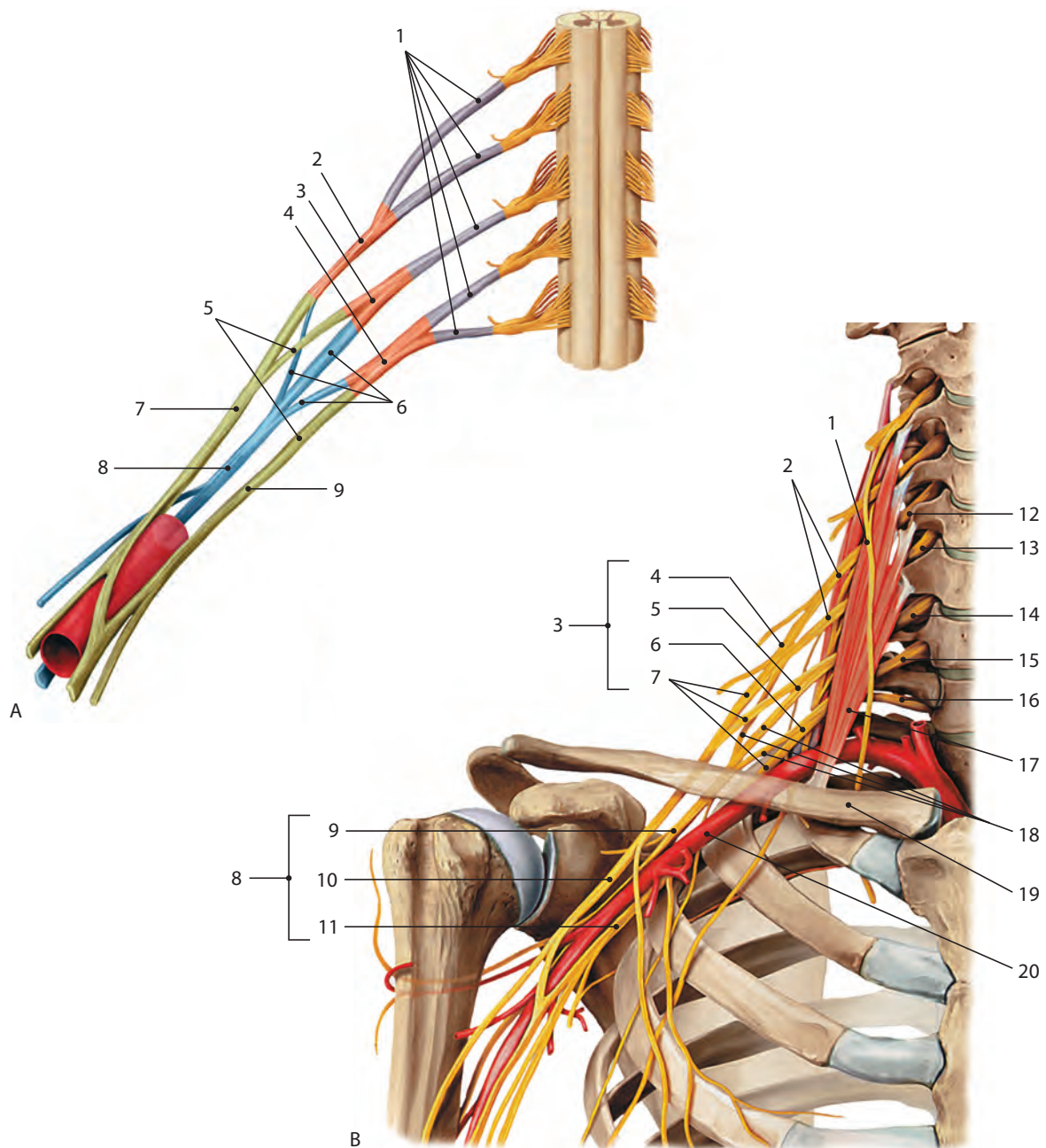


Fig. 67. Composition (A), supraclavicular and infraclavicular parts (B) of brachial plexus. A: 1 — spinal nerves (C5–T1), anterior rami; 2 — brachial plexus, superior trunk; 3 — brachial plexus, middle trunk; 4 — brachial plexus, inferior trunk; 5 — brachial plexus, anterior divisions; 6 — brachial plexus, posterior divisions; 7 — brachial plexus, lateral cord; 8 — brachial plexus, posterior cord; 9 — brachial plexus, medial cord. B: 1 — phrenic nerve (cervical plexus); 2 — spinal nerves, anterior rami; 3 — brachial plexus, supraclavicular part; 4 — brachial plexus, superior trunk; 5 — brachial plexus, middle trunk; 6 — brachial plexus, inferior trunk; 7 — brachial plexus, anterior divisions; 8 — brachial plexus, infraclavicular part; 9 — brachial plexus, posterior cord; 10 — brachial plexus, lateral cord; 11 — brachial plexus, medial cord; 12 — C5; 13 — C6; 14 — C7; 15 — C8; 16 — T1; 17 — scalenus anterior; 18 — brachial plexus, posterior divisions; 19 — clavicle; 20 — axillary artery

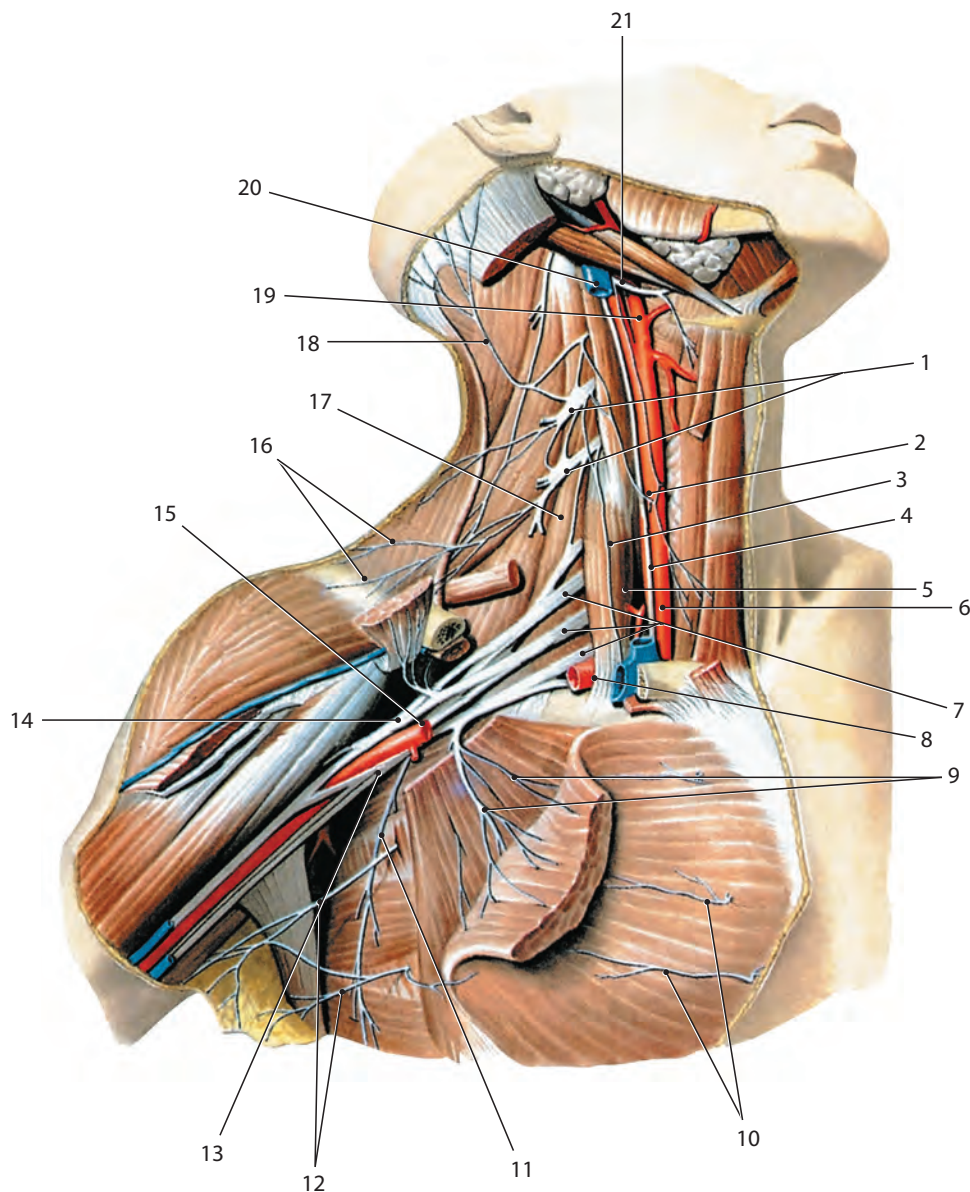


Fig. 68. Branches of the cervical plexus and brachial plexus: 1 — cervical plexus; 2 — ansa cervicalis; 3 — phrenic nerve; 4 — vagus nerve; 5 — anterior scalene; 6 — common carotid artery; 7 — brachial plexus; 8 — subclavian artery (cut); 9 — medial and lateral pectoral nerves; 10 — anterior cutaneous nerves (intercostal nerves); 11 — long thoracic nerve; 12 — intercostobrachial nerves; 13 — medial fascicle of brachial plexus; 14 — lateral fascicle of brachial plexus; 15 — axillary artery; 16 — supraclavicular nerve; 17 — middle scalene; 18 — lesser occipital nerve; 19 — external carotid artery; 20 — internal jugular vein (cut); 21 — hypoglossal nerve

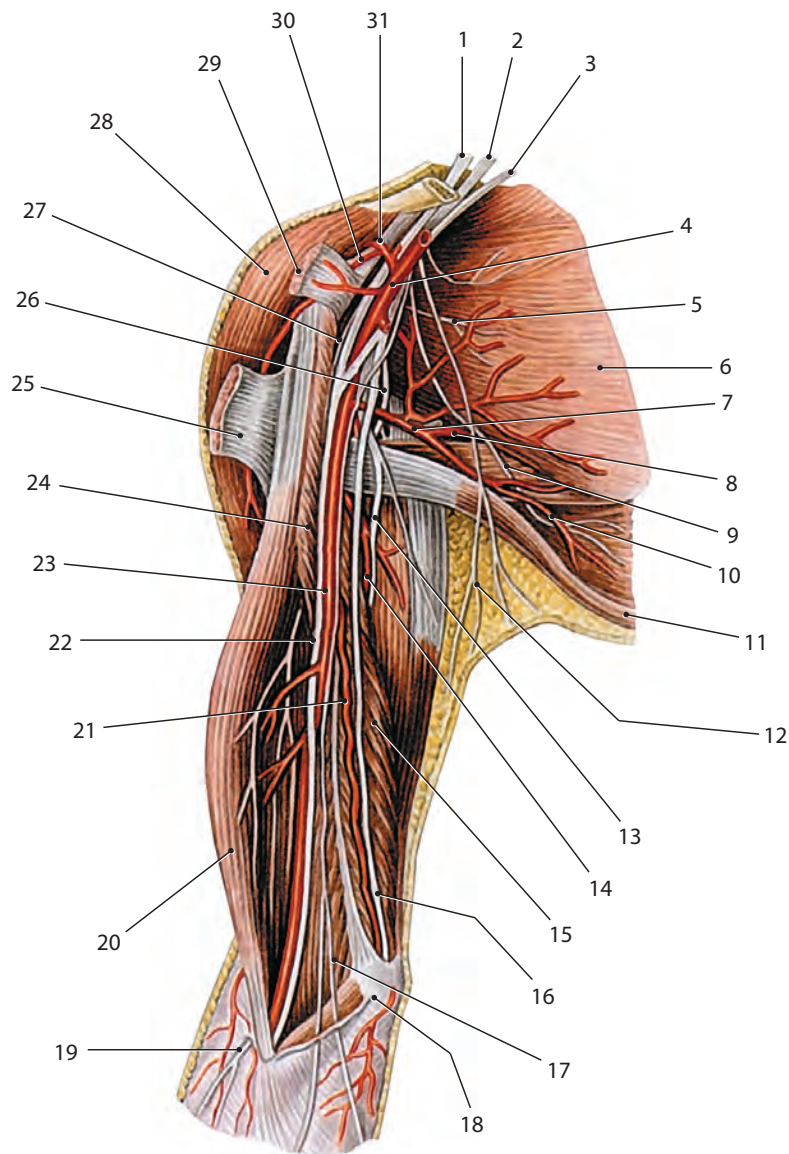


Fig. 69. Infraclavicular part of the brachial plexus (pectorals cut off): 1 — lateral fascicle of brachial plexus; 2 — posterior fascicle of brachial plexus; 3 — medial fascicle of brachial plexus; 4 — axillary artery; 5 — subscapular nerves; 6 — subscapularis; 7 — subscapular artery; 8 — circumflex scapular artery; 9 — thoracodorsal nerve; 10 — thoracodorsal artery; 11 — latissimus dorsi; 12 — medial cutaneous nerve of the arm; 13 — radial nerve; 14 — profunda brachii artery; 15 — triceps brachii; 16 — ulnar nerve; 17 — medial cutaneous nerve of the forearm; 18 — medial epicondyle; 19 — lateral cutaneous nerve of the forearm; 20 — biceps brachii; 21 — superior collateral ulnar artery; 22 — median nerve; 23 — brachial artery; 24 — coracobrachialis; 25 — pectoralis major; 26 — axillary nerve; 27 — musculocutaneous nerve; 28 — deltoid; 29 — pectoralis minor; 30 — deltoid branch of thoraco-acromial artery; 31 — thoraco-acromial artery

I. Branches of the supraclavicular part of the brachial plexus

1. The **dorsal scapular nerve** (*nervus dorsalis scapulae*) arises from the fourth-fifth cervical ventral branches. It pierces the scalenus medius, passes behind the levator scapulae and runs with the deep branch of the dorsal scapular artery to the rhomboids; the nerve supplies these muscles.

2. The **long thoracic nerve**, or **Bell's nerve** (*nervus thoracicus longus*) is composed by roots from the fifth to sixth cervical branches. The nerve descends posterior to the brachial plexus, enters the axilla between the axillary artery and the serratus anterior and then is lodged on the medial wall of the axilla. It innervates the serratus anterior.

3. The **subclavian nerve** (*nervus subclavius*) arises from the upper trunk (C5, C6) and descends in front of the trunks of the brachial plexus and the subclavian artery. The nerve descends behind the clavicle to the subclavius.

4. The **suprascapular nerve** (*nervus suprascapularis*) is a large branch of the superior trunk of the brachial plexus (C5, C6). The nerve runs downwards and laterally deep to the trapezius and omohyoid and enters the suprascapular fossa through the suprascapular notch inferior to the superior transverse scapular ligament. Then the nerve curves round the lateral border of the spine of the scapula with the suprascapular artery to reach the infraspinous fossa. It supplies the supraspinatus and infraspinatus and gives a branch to the shoulder and acromioclavicular joints.

5. The **subscapular nerves** (*nervi subscapulares*) arise by two to three branches from the posterior cord (C6, C7), go inferiorly behind the subscapular vessels and in front the subscapularis, finally enter the teres major and send fibres to both muscles.

6. The **medial** and **lateral pectoral nerves** (*nervi pectorales medialis et lateralis*) are from the medial and lateral cords (C5–T1), pass between the axillary artery and vein, pierce the clavipectoral fascia. They come to the pectoralis minor and pectoralis major.

7. The **thoracodorsal nerve** (*nervus thoracodorsalis*) arises between the subscapular nerves from the posterior cord (C7, C8). The nerve descends over

the subscapularis. It accompanies the thoracodorsal vessels (continuation of the subscapular vessels) to reach the latissimus dorsi.

8. **Muscular branches** extend to the scaleni anterior, middle, posterior, splenius colli.

II. Branches of the infraclavicular part of the brachial plexus

1. The **musculocutaneous nerve** (*nervus musculocutaneus*) is a branch of the lateral cord (C5–C8) of the brachial plexus. The nerve descends between the axillary artery and the coracobrachialis, and then pierces the muscle. It continues distally and laterally between the biceps brachii and the brachialis. The nerve sends **muscular branches** (*rami musculares*) to these three muscles. At the level of the elbow the nerve pierces the deep fascia between the biceps brachii and brachioradialis and continues as the **lateral cutaneous nerve of the forearm** (*nervus cutaneus antebrachii lateralis*) which innervates the skin of the lateral surface of the forearm till over the base of the thenar eminence.

2. The **median nerve** (*nervus medianus*) is constituted by the union of the **lateral** (C6, C7) and **medial** (C8, T1) roots (*radix lateralis et radix medialis*) from the lateral and medial cords of the brachial plexus respectively (Fig. 70). The medial root passes anterior to the third part of the axillary artery from medial to lateral to join the lateral root, and both create the trunk of the median nerve. The trunk descends lateral to the brachial artery in the upper part of the arm, then medial to it. The nerve is deep to the bicipital aponeurosis and the median cubital vein. It gives a branch to the pronator teres, and leaves the cubital fossa between fibres of the muscle, and is separated from the ulnar artery. It is the main nerve of the anterior compartment of the forearm. It continues downwards behind the flexor digitorum superficialis and is lodged to its deep surface. It rests posteriorly on the flexor digitorum profundus, being accompanied by the artery. At the wrist, the median nerve is situated lateral to the tendons of the flexor digitorum superficialis between it and the flexor carpi radialis. The median nerve enters the palm behind the flexor retinaculum and anterior to the flexor tendons through the carpal tunnel.

The median nerve has branches only in the forearm. All the flexors are innervated by the *muscular branches (rami musculares)* of the median nerve except the flexor carpi ulnaris and the medial part of the flexor digitorum profundus which are supplied by the ulnar nerve. It innervates the elbow joint. The *anterior interosseous nerve (nervus interosseus antebrachii anterior)* arises from the median nerve as it emerges from the pronator teres. It descends on the anterior surface of the interosseous membrane and lies between the flexor pollicis longus and the flexor digitorum profundus. The nerve is accompanied by the anterior interosseous artery. It ends on the anterior surface of the carpal bones extending under the pronator quadratus. It innervates deep muscles of the forearm, the wrist and distal radio-ulnar joints, interosseous membrane, bones of the forearm. The *palmar branch (ramus palmaris)* arises in the lower part of the forearm, and passes superficial to the flexor retinaculum. It comes to the skin over the lateral two thirds of the palm (Fig. 71). *Common palmar digital nerves (nervi digitales palmares communes)* originate deeper to the palmar aponeurosis. Three common nerves supply the skin of the lateral three and a half fingers on the palmar surface. The second and third common nerves run towards the clefts between the ring, middle and index fingers and each is divided into two *proper palmar digital nerves (nervi digitales palmares proprii)* to supply contiguous sides of these digits. The first common nerve gives off two proper nerves to the sides of the thumb and one proper nerve to the lateral side of the index finger. The nerves are visible only in the digits and are accompanied by the palmar digital arteries. The nerves supply the joints and palmar skin of the digits and extend to the back to the skin of the distal phalanx and the bed of the nail. Muscular branches innervate the abductor pollicis brevis, the superficial head of the flexor pollicis brevis, the opponens pollicis and the first and second lumbricals.

3. The **ulnar nerve** (*nervus ulnaris*) (C7, C8, T1) arises from the medial cord (C8, T1) and receives a communication from the lateral cord (C7) via the lateral root of the median nerve (Fig. 72). The nerve descends between the axillary artery and vein, and is placed posterior to the medial cutane-

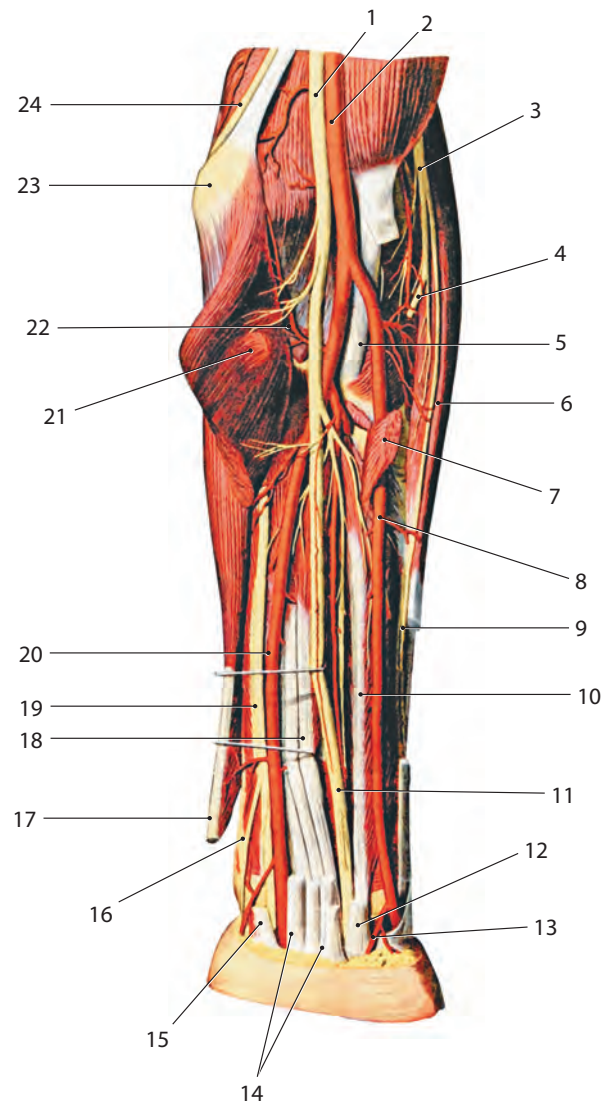


Fig. 70. The median and other nerves on the left anterior compartment of the forearm (superficial muscles were removed): 1 — median nerve; 2 — brachial artery; 3 — radial nerve; 4 — deep branch of radial nerve; 5 — tendon of biceps brachii; 6 — brachioradialis; 7 — pronator teres (cut and turned aside); 8 — radial artery; 9 — superficial branch of radial nerve; 10 — flexor pollicis longus; 11 — median nerve; 12 — tendon of flexor carpi radialis (cut); 13 — superficial palmar branch of radial artery; 14 — tendon of flexor digitorum superficialis (cut); 15 — tendon of flexor carpi ulnaris; 16 — dorsal branch of ulnar nerve; 17 — flexor carpi ulnaris; 18 — flexor digitorum profundus; 19 — ulnar nerve; 20 — ulnar artery; 21 — flexor digitorum superficialis (cut); 22 — ulnar recurrent artery; 23 — medial epicondyle; 24 — ulnar nerve

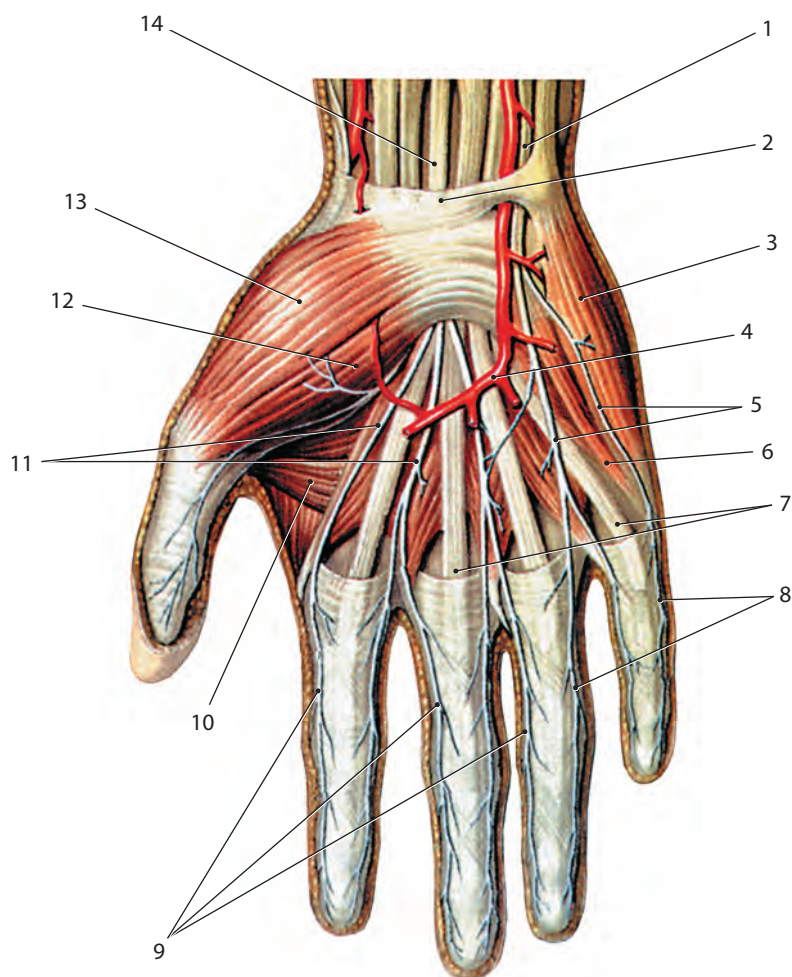


Fig. 71. Nerves of the hand (palmar aspect): 1 — ulnar nerve; 2 — flexor retinaculum; 3 — abductor digiti minimi; 4 — superficial palmar arch; 5 — common palmar digital nerves of ulnar nerve; 6 — opponens digiti minimi; 7 — tendons of flexor digitorum superficialis; 8 — proper palmar digital nerves of ulnar nerve; 9 — proper palmar digital nerves of median nerve; 10 — adductor pollicis (transverse head); 11 — common palmar digital nerves of median nerve; 12 — flexor pollicis brevis; 13 — abductor pollicis brevis; 14 — median nerve (palmar branch)

ous nerve of the forearm. Then it descends medial to the brachial artery. In the distal half of the arm, at the insertion of the coracobrachialis, it passes backwards with the superior ulnar collateral artery and pierces the medial intermuscular septum. The nerve is sited posterior to the medial epicondyle and is covered by the medial head of the triceps brachii. The nerve can be rolled by the palpating finger behind the medial epicondyle of the humerus. The ulnar nerve has no branches in the arm. At the elbow, the ulnar nerve is located behind the median epicondyle of the humerus accompanied by the

posterior ulnar recurrent artery. The nerve enters the anterior compartment of the forearm between two portions of the flexor carpi ulnaris. In the forearm it descends between the flexor carpi ulnaris and the flexor digitorum superficialis. The ulnar artery is positioned lateral to the ulnar nerve in the lower two thirds of the forearm. At the wrist, the ulnar nerve becomes superficial and is situated between the tendons of the flexor carpi ulnaris and the flexor digitorum superficialis. It gives *muscular branches (rami musculares)* to the flexor carpi ulnaris and to the medial half of the flexor digitorum profundus.