

CERVICAL SPINE:

MUSCLE LAYERS

1. Superficial Layer: [Muscles of the Upper Limb] Trapezius and Stermo Cleido Mastoid

2. Splenius and Levator Scapulae:

Splenius Capitis

Splenius Cervicis

Levator Scapulae

3. Semispinalis

Medially

Semispinalis Capitis

Semispinalis Cervicis

Laterally

Transversus Thoracis

Longisssimus Thoracis

Iliocostalis (Superior Portion)

4. Deep Layer

Suboccipital Group

Rectus Major
Rectus Minor

Superior Oblique
Inferior Oblique

Cervical Transverso-Spinalis

Interspinous Muscles

TABLE 1
Movements of the Neck and of the Head on the Neck

MOVEMENT	MUSCLES	NERVE SUPPLY
Flexion	Sternocleidomastoid	Accessory
	Longus colli	Cervical ventral rami
Extension	Longus capitis	Cervical ventral rami
	Rectus capitis anterior*	C. I. ventral ramus
	Splenius cervicis and capitis	Cervical dorsal rami
	Erector spinae	Cervical dorsal rami
	Rectus capitis posterior major and minor*	C. I. dorsal ramus
	Obliquus capitis superior*	C. I. dorsal ramus
	Trapezius	Accessory
	Sternocleidomastoid†	Accessory
	Scalenes	Cervical ventral rami
	Longus colli	Cervical ventral rami
Lateral flexion and rotation	Rectus capitis lateralis*	C. I. ventral ramus
	Levator scapulae (shoulder fixed)	Cervical ventral rami
	Splenius†	Cervical dorsal rami
	Longissimus	Cervical dorsal rami
	Obliquus capitis superior† and inferior	C. I. dorsal ramus†

* These muscles act mainly as ligaments of adjustable length and tension.
 † In rotation turns the face towards the opposite side.
 ‡ In rotation turns the face to the same side.

Anatomically, these muscles can also be grouped according to their positional relationship

to the spine, such as postvertebral, prevertebral, and lateral muscles of the neck.

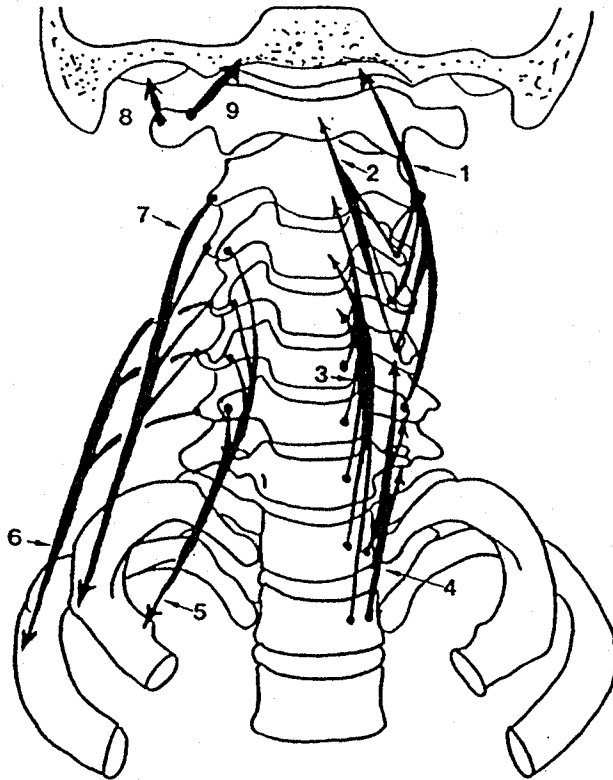


Fig. 1-20. Schema of the anterior muscles of cervical spine. (1) Longus capitis. (2) Longus colli (superior oblique part). (3) Longus colli (vertical part). (4) Longus colli (inferior oblique part). (5) Anterior scalene. (6) Posterior scalene. (7) Middle scalene. (8) Rectus capitis lateralis. (9) Rectus capitis medialis.

structure accomplish this movement. The muscles involved in producing tension, flexion, rotation, and lateral bending of the neck and head are as follows.

Extension

- Splenius capitis
- Splenius cervicis
- Semispinalis capitis
- Semispinalis cervicis
- Longissimus capitis
- Longissimus cervicis
- Trapezius
- Interspinalis
- Rectus capitis posterior major
- Rectus capitis posterior minor
- Obliquus capitis superior
- Sternocleidomastoid (posterior fibers)

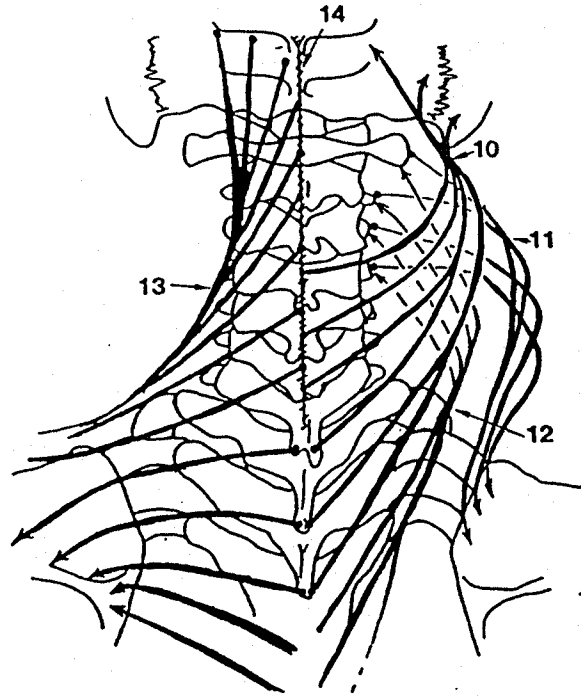


Fig. 1-21. Schema of the superficial muscles of posterior cervical region. (10) Splenius capitis. (11) Levator scapulae. (12) Splenius cervicis. (13) Trapezius (cervical part).

Flexion

- Sternocleidomastoid (anterior fibers)
- Longus colli
- Longus capitis
- Rectus capitis anterior

Rotation and Lateral Flexion

- Sternocleidomastoid
- Scalene group
- Splenius capitis
- Splenius cervicis
- Longissimus capitis
- Levator scapulae
- Longus colli
- Iliocostalis cervicis
- Multifidi
- Intertransversarii
- Obliquus capitis inferior
- Obliquus capitis superior
- Rectus capitis lateralis

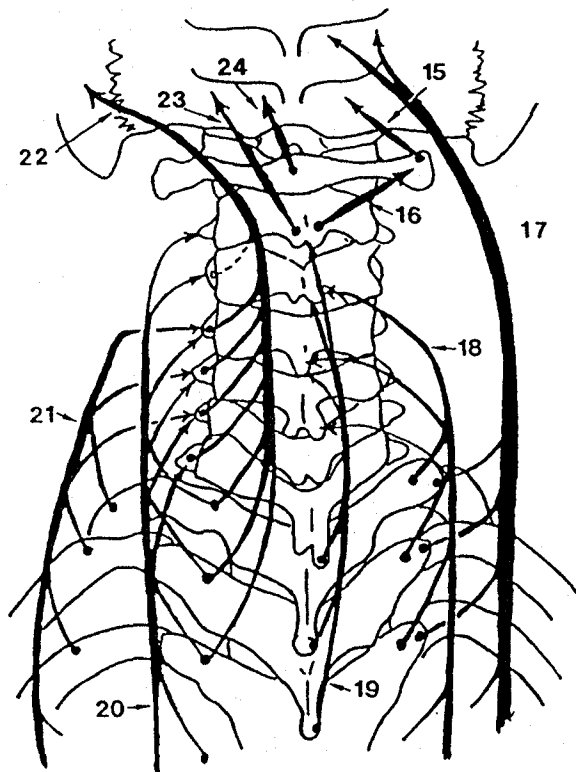


Fig. 1-22. Schema of the deeper spinal musculature of the cervical region. (15) Superior oblique muscle. (16) Inferior oblique muscle. (17) Semispinalis capitis. (18) Semispinalis cervicis. (19) Spinalis cervicis. (20) Longissimus cervicis. (21) Iliocostalis cervicis. (22) Longissimus capitis. (23) Rectus capitis posterior major. (24) Rectus capitis posterior minor.

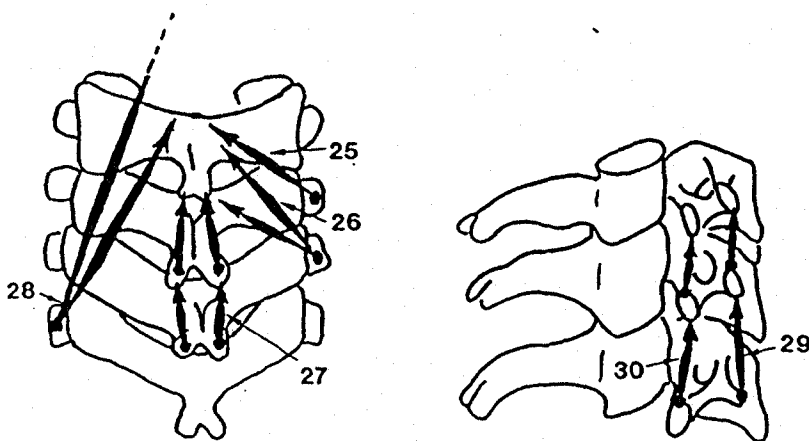


Fig. 1-23. Schema of the short muscles of the cervical spine. (25) Short rotator. (26) Long rotator. (27) Interspinales. (28) Multifidus. (29) Anterior intertransversarii. (30) Posterior intertransversarii.

3

Vertebral Column: SUBOCCIPITAL TRIANGLE

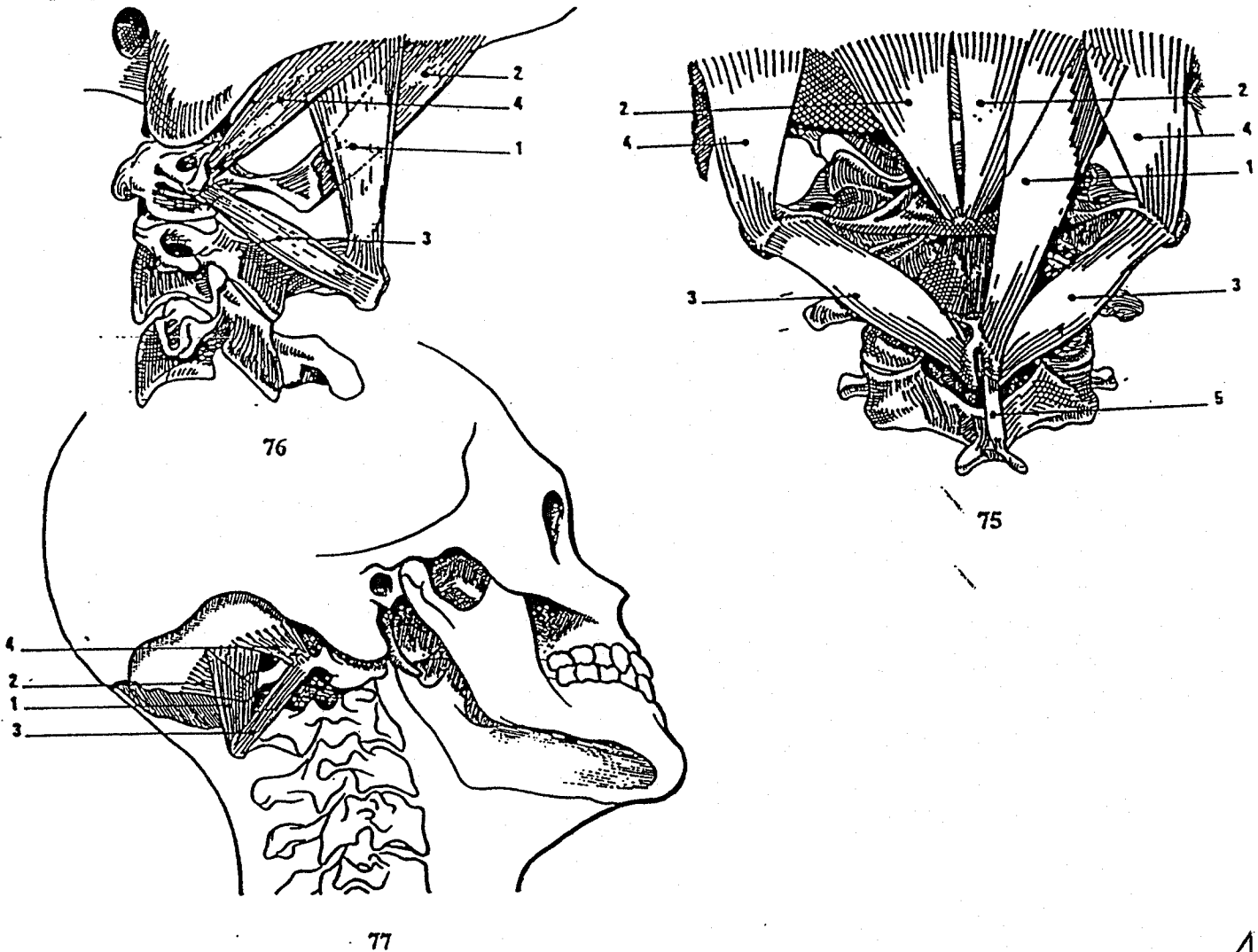
SUBOCCIPITAL MUSCLES

The suboccipital muscles are used for fine tuning motions of the head and neck.

The four muscles of the suboccipital triangle are arranged as follows..

Two muscles from the tips of the spinous process to the nuchal line at the base of the skull. The shorter one, the uniarticular muscle, **RECTUS CAPITIS POSTERIOR MINOR** [Rectus Minor - #2] runs from the spinous process of the atlas superiorly and slightly laterally. The slightly longer, the biarticular muscle, **RECTUS CAPITIS POSTERIOR MAJOR**, [Rectus Major - #1] runs from the spinous process of the axis superiorly and slightly laterally.

Two "oblique" muscles the superior and inferior. The **OBLIQUUS CAPITIS INFERIOR** [Inferior Oblique - #3] attaches from the lateral side of spinous process of the axis [C2] and runs upwards and laterally to attach to the spinous process of the atlas [C1]. The **OBLIQUUS CAPITIS SUPERIOR** [Superior Oblique - #4] attaches to the transverse process of the atlas [C1] and runs upwards to attach to the base of the skull.



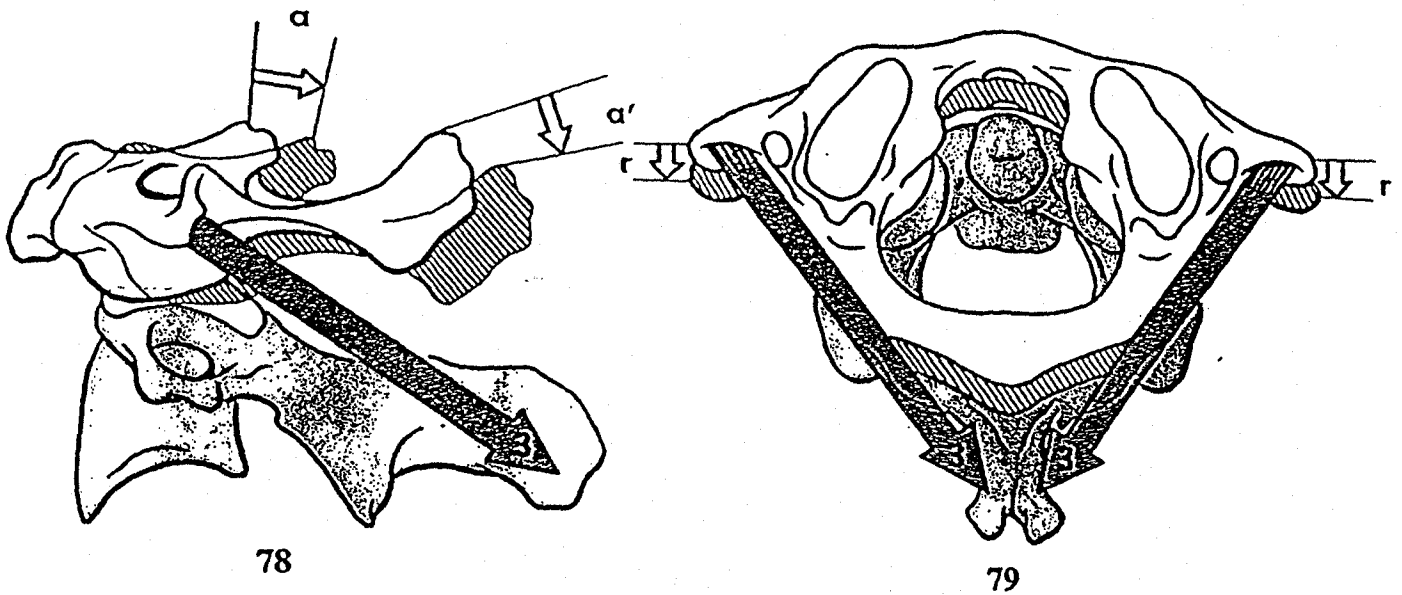
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15

Vertebral Column: SUBOCCIPITAL TRIANGLE

ACTION OF THE SUBOCCIPITAL MUSCLES

The Oblique Capitis Inferior [3]: Maintains the the spatial relationship of the atlanto-axial joint (between the Atlas and Axis composed of three [Atlanto-Odontoid and the bilateral atlanto- axial joints] anatomically and mechanically linked joints). When both concentrically contracts (fig 78 side view & fig 79 superior view) they pull back and extend the atlas on the axis. When both muscles concentrically contract they relax the tension in the transverse ligament (fig 79- ligament not shown).

The lines of action of the suboccipital muscles are posterior to the axis of flexion and extension.



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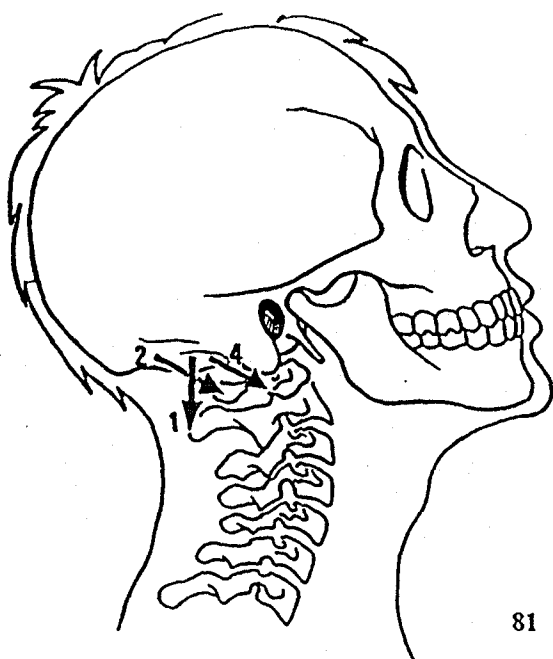
LATERAL FLEXION

Unilateral concentric contraction of the four suboccipital muscles results in lateral flexion at the atlanto-occipital joint. (Fig 80) In order to produce lateral flexion, the inferior oblique [3] must stabilize the atlas so that the superior oblique muscle may rotate the head laterally (produce lateral flexion). The superior oblique [4] has the greatest mechanical advantage (i.e. has the longest lever arm) of the suboccipital muscles. The rectus major [1] and rectus minor [2] lying close to the midline do not have as great mechanical advantage as the superior oblique.



80

6/17



EXTENSION

Bilateral concentric contraction of the four suboccipital muscles will extend the head. The Rectus Minor [2] and the Superior Oblique [4] will extend at the atlanto-occipital joint. The Rectus Major [1] and the Inferior Oblique will extend at the atlanto-axial joint.

81

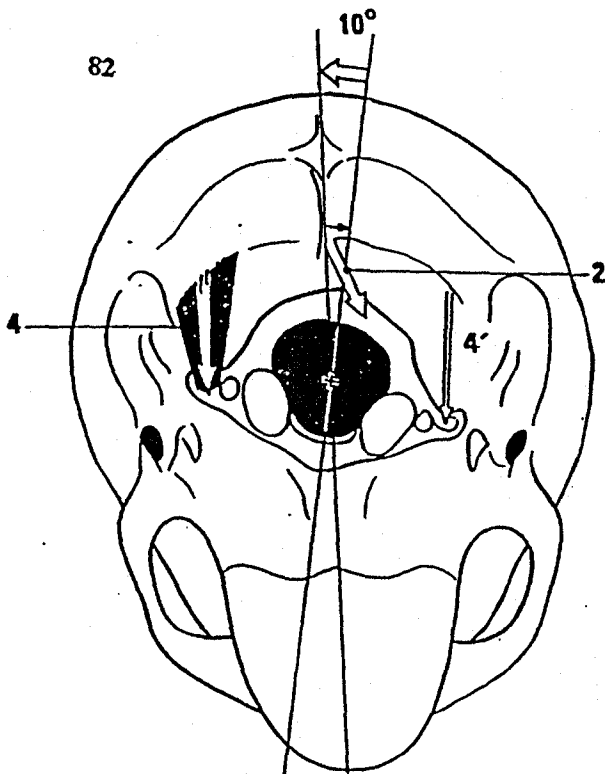
AXIAL ROTATION

Atlanto-Occipital Joint

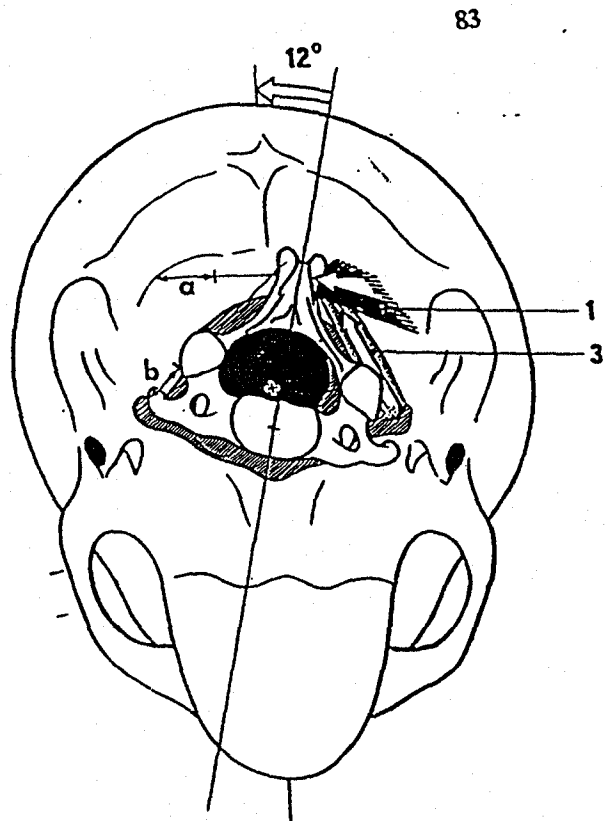
At the atlanto-occipital joint, the Superior Oblique [4] rotates the head contralaterally (i.e. the left Superior Oblique will rotate the head to the right). Fig 82

Atlanto-Axial

The Rectus Major [3] and the Inferior Oblique [1] will rotate the head ipsilaterally (i.e. to the same side).



82



83

7
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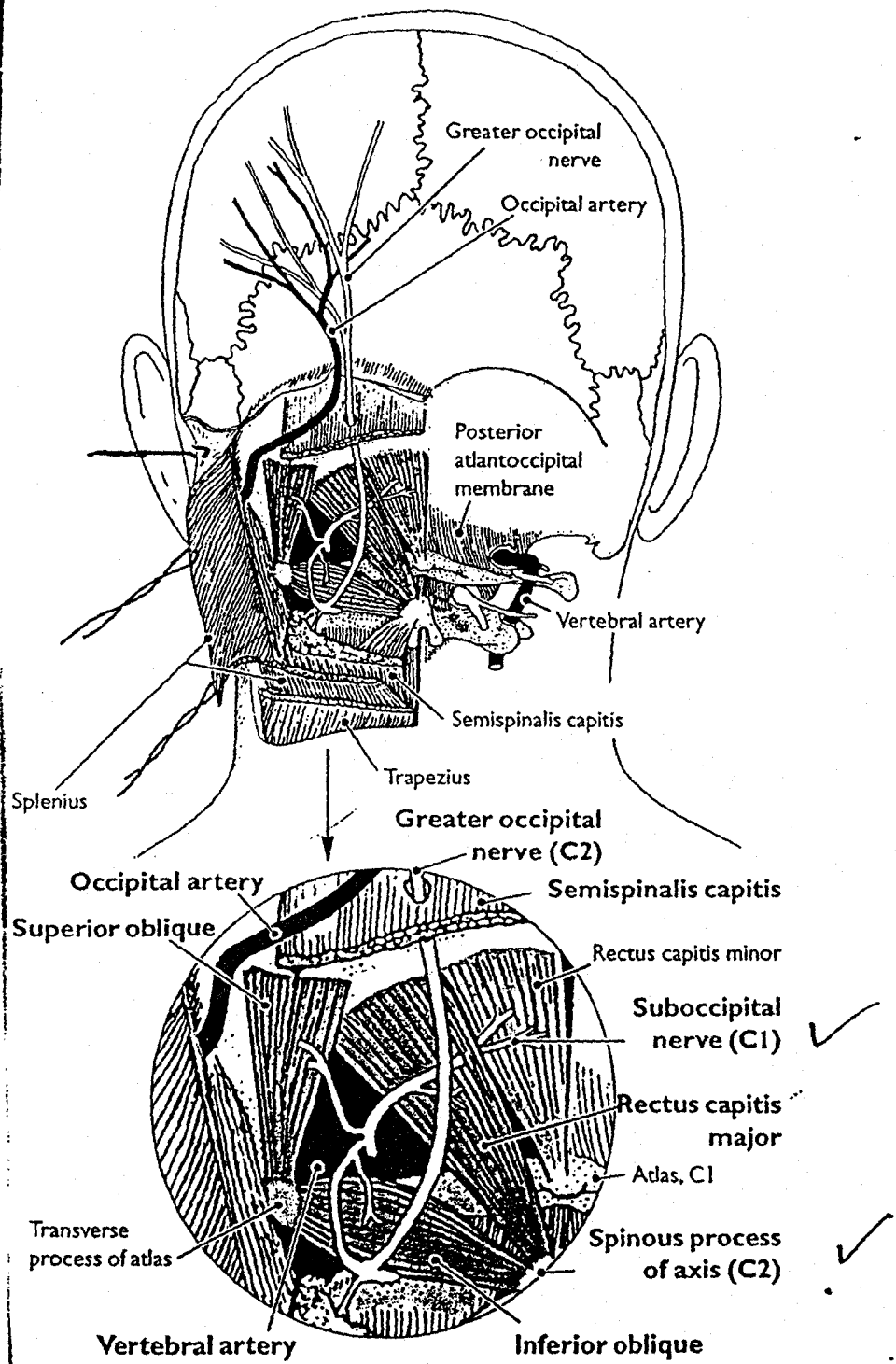
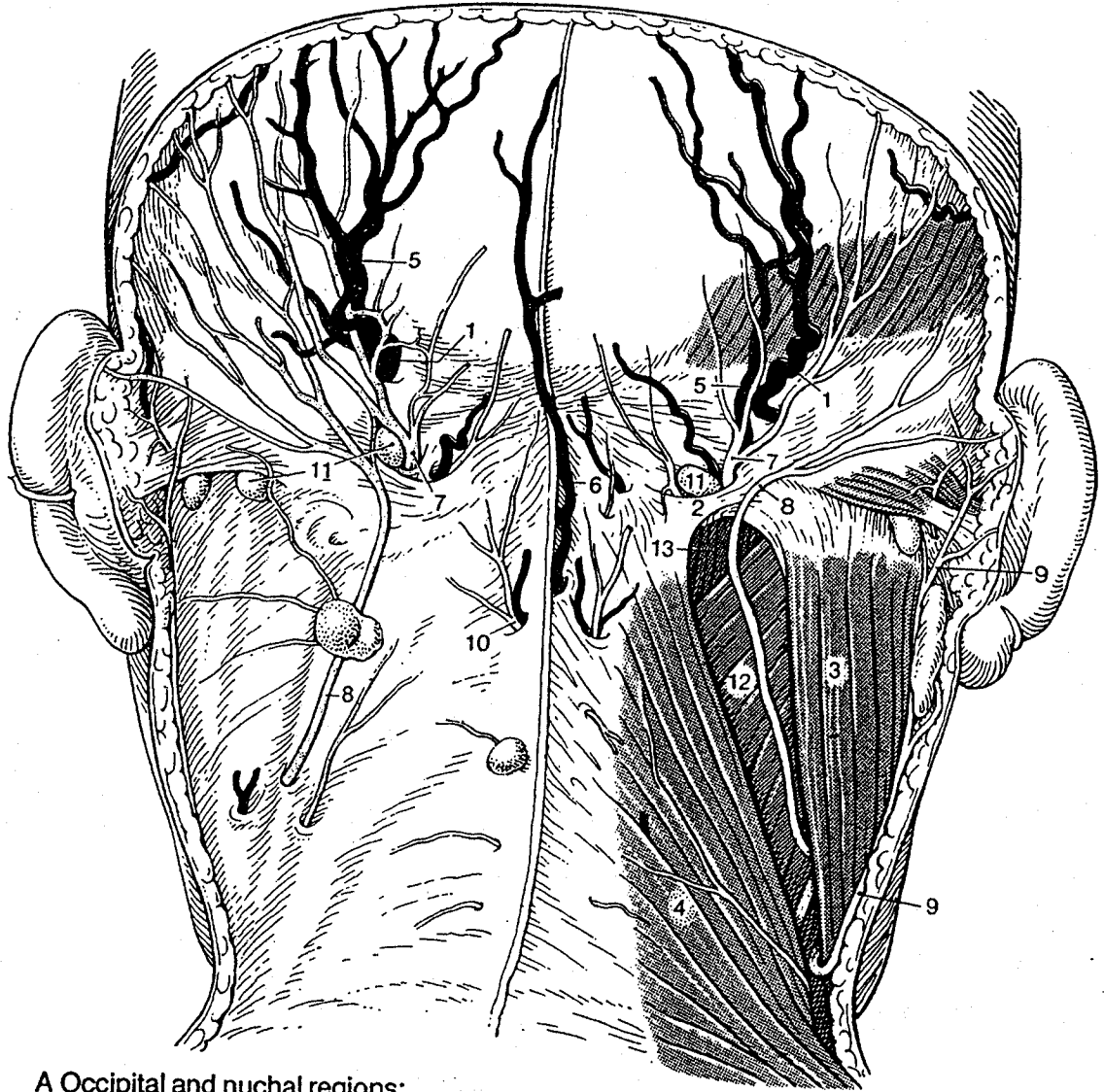
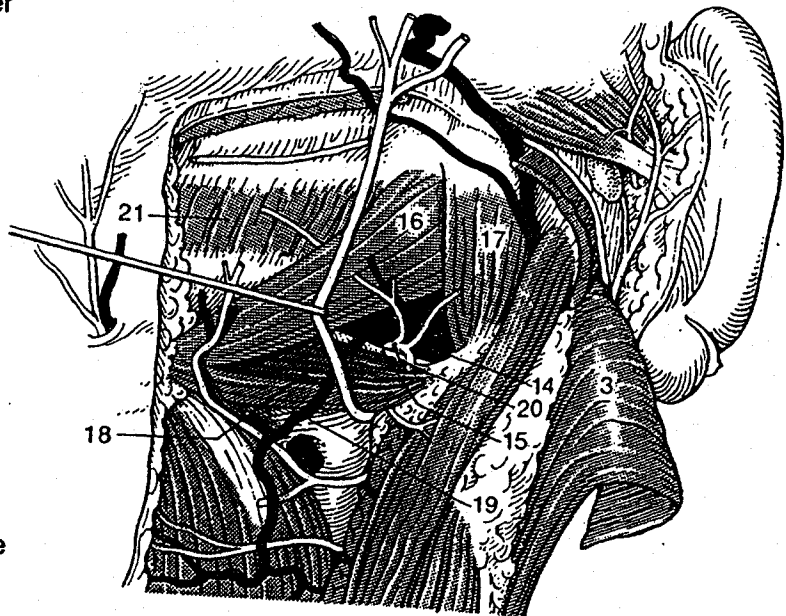


Figure 4.14. Suboccipital region.

the rectus
 : obliquus
 obliquus
 a the ver-
 (19) to the
 the artery
 as lies the
 is the dor-
 cal spinal
 mentioned
 posterior



A Occipital and nuchal regions;
 left: subcutaneous layer
 right: subfascial layer



B Suboccipital triangle