

# Photographic Atlas of Practical Anatomy Volume 2

**Walter Thiel** 





Springer

# WALTER THIEL

# Photographic Atlas of Practical Anatomy

Volume 2

Neck · Head · Back Chest · Upper Extremities

Translated by Terry C. Telger With the Assistance of Udo Schumacher

With 205 Color and 205 Black and White Figures



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# Prologue

The dissections pictured in this book are from individuals who willed their bodies to medical science that they might benefit the sick.

THEIR DEATH CARRIES THE DIGNITY OF RENDERING SELFLESS SERVICE TO THE LIVES OF OTHERS

### **Preface**

In the Preface to the first volume of the Photographic Atlas of Practical Anatomy, we explained our special interpretation of the structure of the superficial fascia of the human body. The second volume of the Atlas retains this concept and further substantiates its validity.

The order in which the anatomic regions are presented may seem unconventional, but it is intended to reflect the importance of "transitional regions" in understanding anatomic relationships. Wherever possible, regions that border one another are presented in sequence. Additionally, we wanted the format of the second volume to follow that of the first, so the joints are placed at the end of the book and the preceding pages are devoted to the upper limb.

We start with the neck, as it provides a logical transition to the head. The nuchal region serves the same function for the back, which, as part of the thoracic cage, forms a gateway to the lateral and anterior chest wall and finally to the upper limbs, which originally developed from the torso as ventral buds.

A photographic presentation, more than any other, is bound to reflect individual variations. This is not necessarily a disadvantage, and we hope that our approach will serve to "flesh out" general and abstract principles.

Our reference list covers only works that relate directly to the second volume. Other sources may be found by consulting the more comprehensive bibliography and preface of Volume 1.

Graz, autumn 1998

Walter Thiel

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Neck Carotid Triangle Thyroid Gland Head Salivary Glands Temporal Region and Orbit

Suboccipital Puncture Back Lumbar Puncture

Thorax and Breast Breast Contents Axillary Cavity

Upper Arm Elbow Forearm Hand

Shoulder Joint Elbow Joint Joints of the Hand

# Figure 1 Superficial Cervical Region 1 Punctum Nervosum

A thin **superficial cervical fascia** invests the surface of the neck under cover of the outer skin, the **common integument**, and the **platysma**.

The **platysma** is a muscular sheet lying below the skin of the neck on the plane of the **subcutaneous tissue**, which elsewhere in the body may contain abundant fat. All of the deep surface of this plane is bounded by a fascia-like layer of connective tissue called the **deep layer** of the stratum subcutaneum (see Introduction in Volume 1).

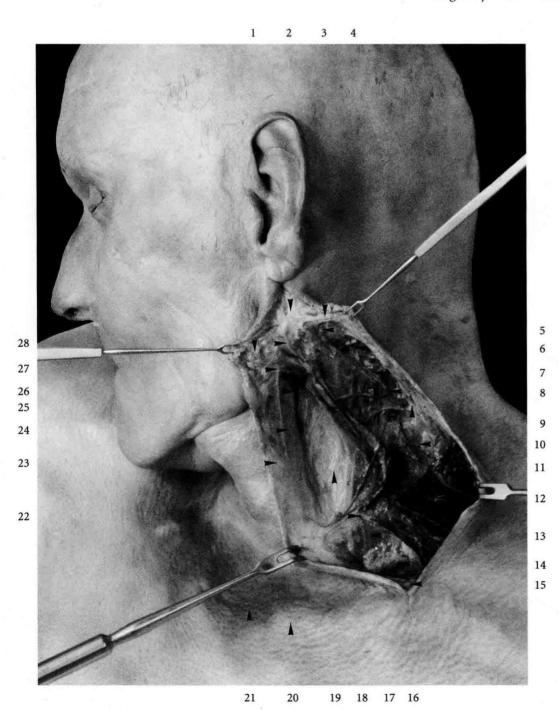
The platysma is bounded by a connective tissue layer on both its superficial and deep surfaces, the inner layer being considerably stronger than the outer layer. The connective tissue layer unites with the thin superficial cervical fascia to form a stronger layer that invests the cutaneous nerve trunks and major blood vessels. The portion of this layer in front of the external jugular vein has been preserved. Behind that vein, the portion corresponding to the deep layer of the stratum subcutaneum has been removed by sharp dissection to expose

the cutaneous nerves of the **cervical plexus**, which become superficial at the **punctum nervosum**.

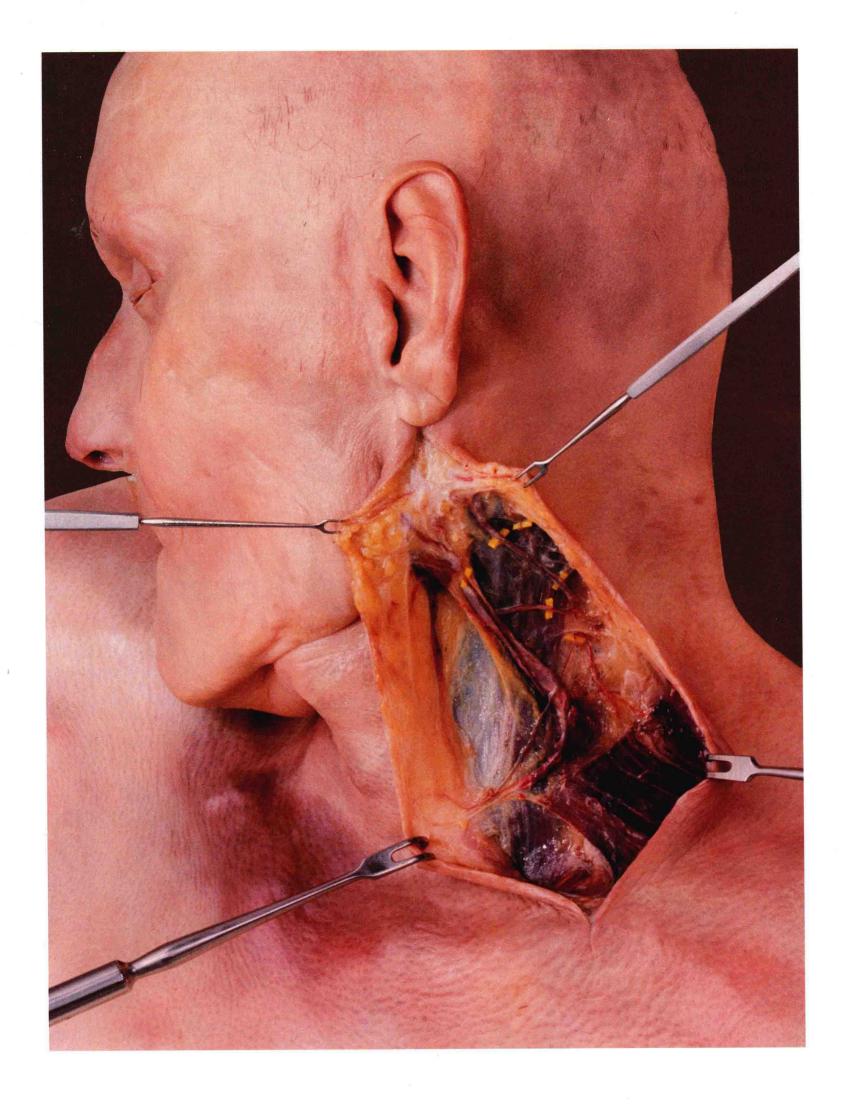
The great auricular nerve, which divides into an anterior and posterior ramus, is tagged. The transverse cervical nerve tracks toward the front, crossing below the external jugular vein.

The lower tagged nerve is a **medial supraclavicular nerve**, called also the **suprasternal nerve** because it passes to the skin over the manubrium sterni. The remaining supraclavicular nerves and lesser occipital nerve occupy a somewhat deeper plane and become superficial at some distance from the punctum nervosum (see Lateral Cervical Region).

The strip of fatty tissue that accompanies the **external jugular vein** is a typical structural feature of the **flat tunnels** described in the Introduction. Next to the external jugular vein is a **cervical branch** of the **facial nerve**. The **platysma** stumps define the area in which the muscle originally covered the vein.



- 1 Subcutaneous tissue (with copious fat)
- 2 Parotid fascia
- 3 Junction of parotid fascia with firm deep layer of stratum subcutaneum
- 4 Transverse cervical nerve
- 5 Auricularis magnus nerve (anterior branch)
- 6 Auricularis magnus nerve (posterior branch)
- 7 Auricularis magnus nerve (trunk)
- 8 Punctum nervosum
- 9 External jugular vein
- 10 Fat pad in posterior cervical triangle with branch of transversa cervicalis artery
- 11 Medial supraclavicular nerve (suprasternal nerve)
- 12 Platysma
- 13 Sternocleidomastoid muscle (covered by superficial cervical fascia)
- 14 Branch of suprascapular artery (suprasternal branch)
- 15 Clavicle
- 16 Attachment of superficial cervical fascia (superficial layer of cervical fascia) to deep layer of stratum subcutaneum
- 17 Superficial cervical fascia (cut edge)
- 18 Sternocleidomastoid muscle (covered by superficial cervical fascia)
- 19 Superficial cervical fascia (thickened by fusion with deep layer of stratum subcutaneum from deep surface of platysma)
- 20 Sternoclavicular joint
- 21 Jugular fossa
- 22 Residual bridge of deep layer of stratum subcutaneum from deep surface of platysma
- 23 Subcutaneous tissue (devoid of fat)
- 24 Deep layer of stratum subcutaneum from outer surface of platysma
- 25 Facial nerve (cervical branch)
- 26 Platysma (cut edge)
- 27 Continuation of parotid fascia into deep layer of stratum subcutaneum at outer surface of platysma
- 28 Continuation of parotid fascia into deep layer of stratum subcutaneum at deep surface of platysma



### Figure 2 Median Cervical Region 1

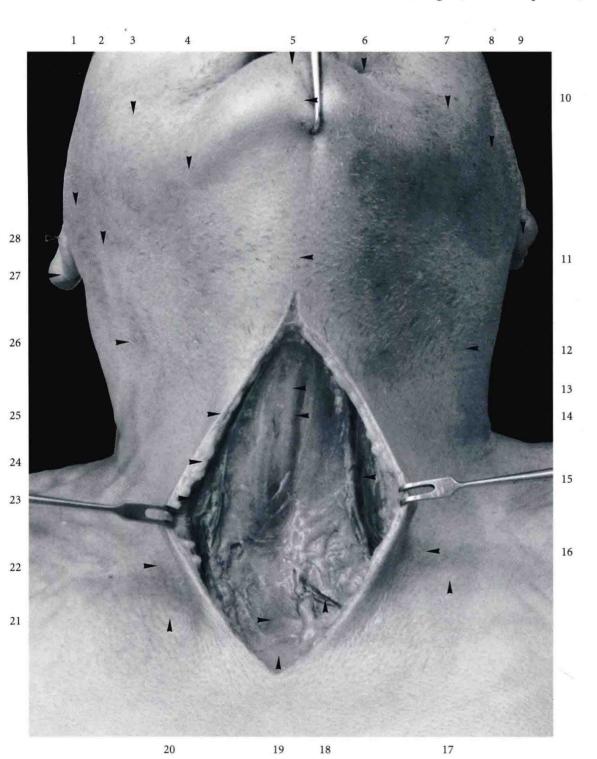
The median cervical region assumes practical importance as a site for surgical approaches to the trachea and larynx. It extends vertically from the hyoid bone to the sternum and is bounded laterally by the omohyoid and sternocleidomastoid muscles. It corresponds to the anterior cervical region minus the carotid, submandibular, and submental triangles and is defined by the two omotracheal muscular triangles that have a common base on the median plane.

The medial borders of the platysma diverge to uncover a gently widening median interval in which the **skin**, with its relatively thin layer of subcutaneous fatty tissue, directly overlies the **superficial cervical fascia**. The fatty tissue surrounding the borders of the platysma forms two prominent longitudinal folds in the lax skin of older individuals.

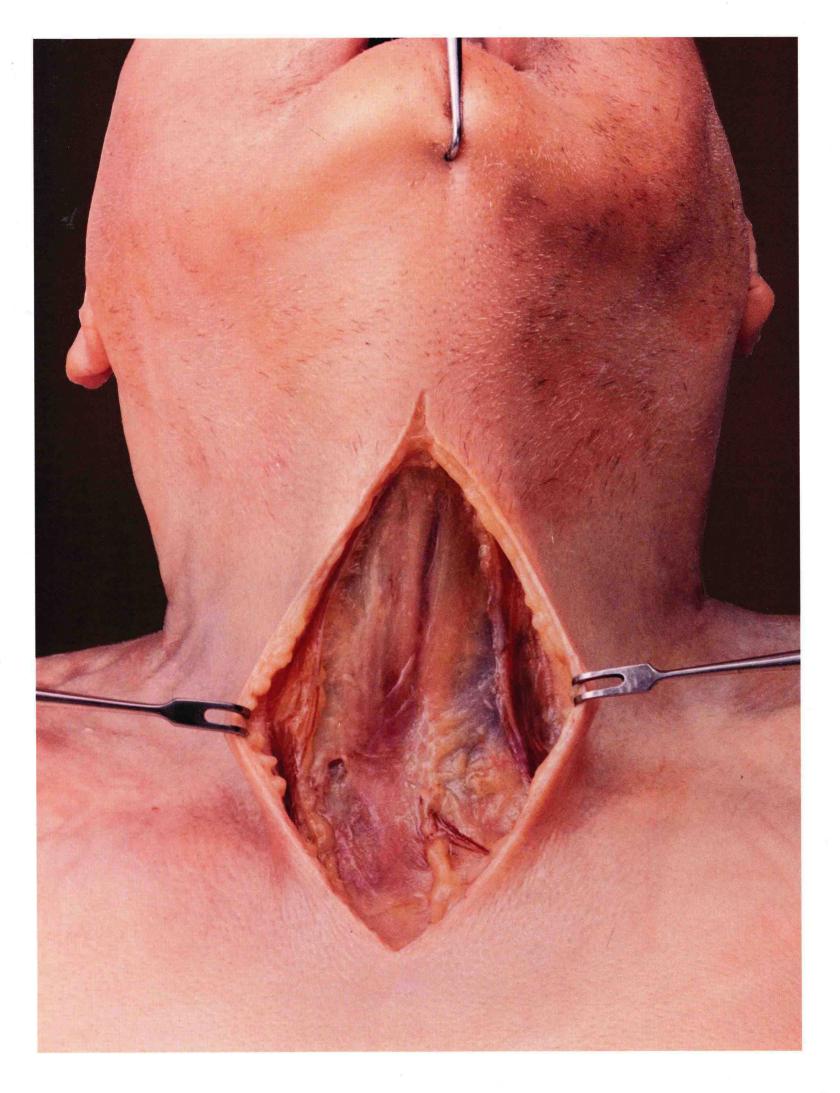
The **skin** in this specimen has been incised on the midline, dissected from the medial borders of the platysma, and retracted laterally with the **subcutaneous tissue**. Lateral to the platysma borders, the plane between the skin and platysma in the infrahyoid region contains little if any fat, even in well-nourished individuals, and consists only of a loose fibrous layer of connective tissue. The same applies to the deep surface of platysma.

The **sternohyoid muscle** is visible through the upper part of the exposed **superficial cervical fascia**, in an area where the superficial fascia is more closely applied to the middle cervical fascia. The **linea alba** of the neck is also faintly visible through the superficial fascia on the cervical midline.

**Aberrant bundles** of platysma are commonly found in the infrahyoid region, as in this specimen, and they are often bilateral.



- 1 Parotid-masseter region
- 2 Position of mandibular angle
- 3 Cheek
- 4 Position of inferior border of mandible
- 5 Lower lip
- 6 Angle of mouth
- 7 Cheek
- 8 Parotid-masseter region
- 9 Earlobe
- 10 Chin
- 11 Position of hyoid bone
- 12 Bulge of sternocleidomastoid muscle
- 13 Linea alba of neck, visible through superficial cervical fascia
- 14 Medial border of sternohyoid muscle behind fascial layers
- 15 Platysma
- 16 Greater supraclavicular fossa
- 17 Bulge of clavicle
- 18 Platysma (aberrant muscle bundle)
- 19 Manubrium sterni
- 20 Prominence of sternal end of clavicle
- 21 Jugular fossa
- 22 Position of posterior border of sternocleidomastoid muscle
- 23 Platysma
- 24 Subcutaneous tissue
- 25 Skin (cut edge)
- 26 Bulge of sternocleidomastoid muscle
- 27 Earlobe
- 28 Antitragus



### Figure 3 Median Cervical Region 2

The **skin** and **subcutaneous tissue** have been incised on the midline, dissected from underlying tissues and retracted laterally, and the exposed **superficial cervical fascia** has been opened with a vertical midline incision and its edges retracted. The fascia splits at the **sternocleidomastoid** into layers that ensheath the muscle. This sheath has been opened close to the attachment of the muscle.

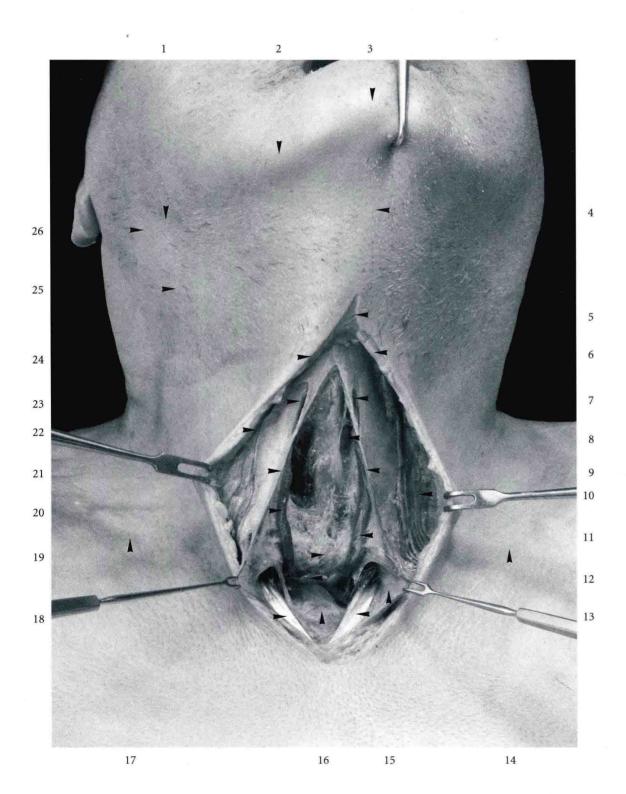
The incision of the superficial cervical fascia has opened the **suprasternal space**, which is filled with fibrofatty tissue. Inferiorly this space encompasses the full width of the jugular notch of the sternum and contains the **jugular arch**, which is of variable size. The same space contains both **anterior jugular veins**, which have been exposed somewhat higher through slits in the superficial cervical fascia. The space tapers superiorly to form a narrow cleft in which the superficial fascia

is applied to the **middle cervical fascia**. This fascia and the embedded infrahyoid muscles form the entire posterior wall of the space.

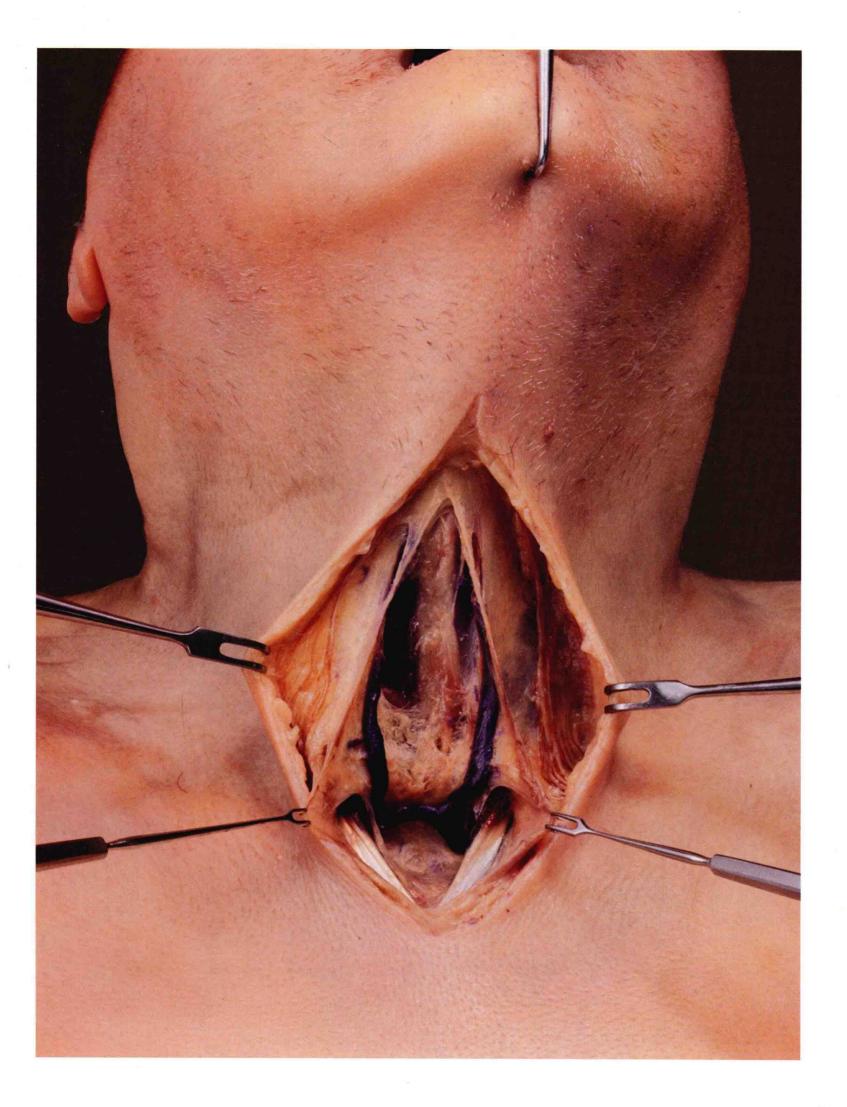
The **sternohyoid** and other enclosed muscles are clearly visible through the thin overlying fascia, their fascial sheaths blending in the median plane to form a narrow, pale stripe called the **linea alba** of the neck.

In the lower part of the suprasternal space, a remnant of connective tissue left behind the jugular arch obscures vision of the posterior wall of the space.

The **jugular arch** interconnects the sites where the anterior jugular veins drain into the subclavian veins or the junction of the subclavian and internal jugular veins.



- 1 Position of mandibular angle
- Position of inferior border of mandible
- 3 Chin
- 4 Submental triangle
- 5 Position of hyoid bone
- 6 Subcutaneous tissue
- 7 Slit in superficial cervical fascia
- 8 Medial border of left sternohyoid muscle (visible through fascia)
- 9 Superficial cervical fascia (cut edge)
- 10 Platysma
- 11 Anterior jugular vein
- 12 Jugular arch
- 13 Tendon of sternocleidomastoid muscle
- 14 Bulge of clavicle
- 15 Sternoclavicular joint
- 16 Jugular notch of sternum
- 17 Bulge of clavicle
- 18 Tendon of sternocleidomastoid muscle
- 19 Residual connective tissue in suprasternal space
- 20 Anterior jugular vein
- 21 Superficial cervical fascia (cut edge)
- 22 Platysma
- 23 Slit in superficial cervical fascia
- 24 Skin (cut edge)
- 25 Bulge of sternocleidomastoid muscle
- 26 Bulge from cervical lobe of parotid gland



### Figure 4 Median Cervical Region 3

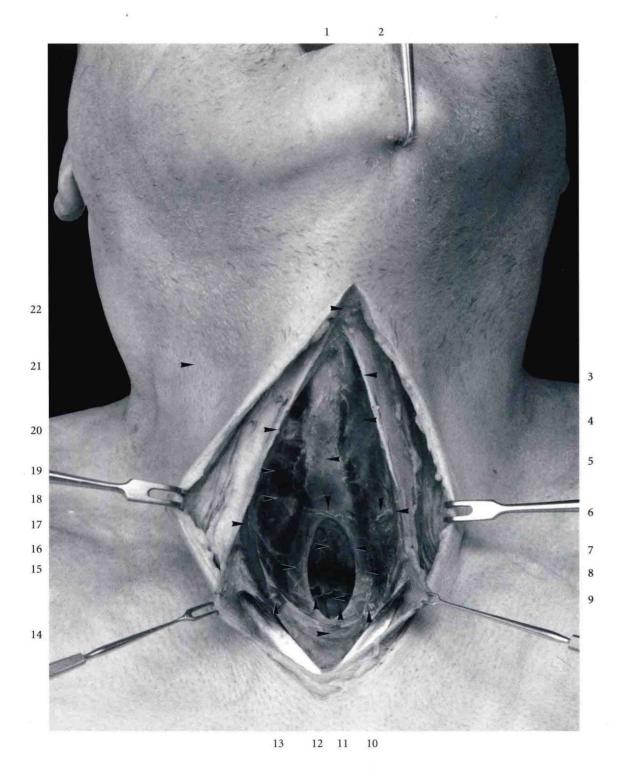
The skin and superficial cervical fascia are retracted as before, the jugular arch has been resected, and the contents of the **suprasternal space** have been removed. The entire posterior wall of the space can now be seen along with the upper end of the sternum with its **jugular notch** and, behind it, the attachment of the **middle cervical fascia** with the embedded **infrahyoid muscles**.

The middle cervical fascia in the lower part of the linea alba has been divided on the median plane, opening the **pretracheal space**. The loose fibrofatty tissue has been removed to expose the **trachea** in the depths of the space. The **tracheal cartilages** should always be palpated and identified before a **tracheotomy** without division of the thyroid isthmus is performed to avoid confusing the trachea with a highly and

anteriorly placed brachiocephalic trunk.

The **thyroid gland isthmus** is visible in the upper half of the elliptical opening. Descending from the isthmus are the **inferior thyroid veins**. These veins may be combined into a single trunk, and their calibers increase several-fold when venous congestion occurs. A somewhat uncommon **thyroid ima artery** is present in this specimen.

The **sternohyoid muscles** are covered only by a very thin portion of the **middle cervical fascia**. But their **tendinous intersections** are often united with one another, as here, by a strong connective tissue band from the linea alba. Thicker fascia covers the **sternothyroid muscles**, which overlap the sternohyoids medially in the lower part of the field.



- 1 Thickened part of middle cervical fascia (pretracheal layer of cervical fascia) between two tendinous intersections
- 2 Tendinous intersection of sternohyoid muscle (incomplete)
- 3 Superficial cervical fascia (cut edge)
- 4 Sternohyoid muscle (covered by fascia)
- 5 Linea alba of middle cervical fascia (at level of conus elasticus)
- 6 Anterior jugular vein
- 7 Middle cervical fascia (cut edge)
- 8 Sternothyroid muscle (covered by fascia)
- 9 Trachea
- 10 Jugular arch (resected)
- 11 Inferior thyroid vein
- 12 Thyroid ima artery
- 13 Jugular arch (resected)
- 14 Jugular notch of sternum
- 15 Sternothyroid muscle (covered by fascia)
- 16 Isthmus of thyroid gland
- 17 Anterior jugular vein
- 18 Intersection of sternohyoid muscle
- 19 Sternohyoid muscle (covered by fascia)
- 20 Superficial cervical fascia (cut edge)
- 21 Bulge of sternocleidomastoid muscle
- 22 Hyoid bone

