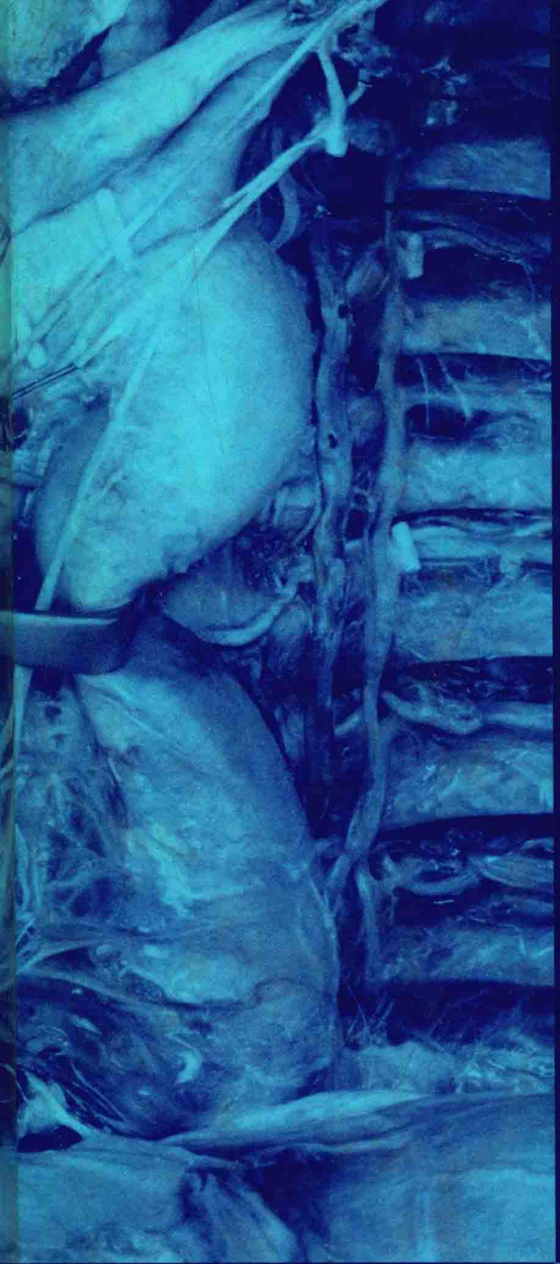

Photographic Atlas of Practical Anatomy

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

Springer

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ISBN 981-4021-46-6
Springer-Verlag Singapore Berlin Heidelberg New York

Printed in Singapore

SPIN 10710568 5 4 3 2 1 0

Springer
Berlin
Heidelberg
New York
Barcelona
Budapest
Hong Kong
London
Milan
Paris
Santa Clara
Singapore
Tokyo

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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Forearm
Hand

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Elbow Joint
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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**.

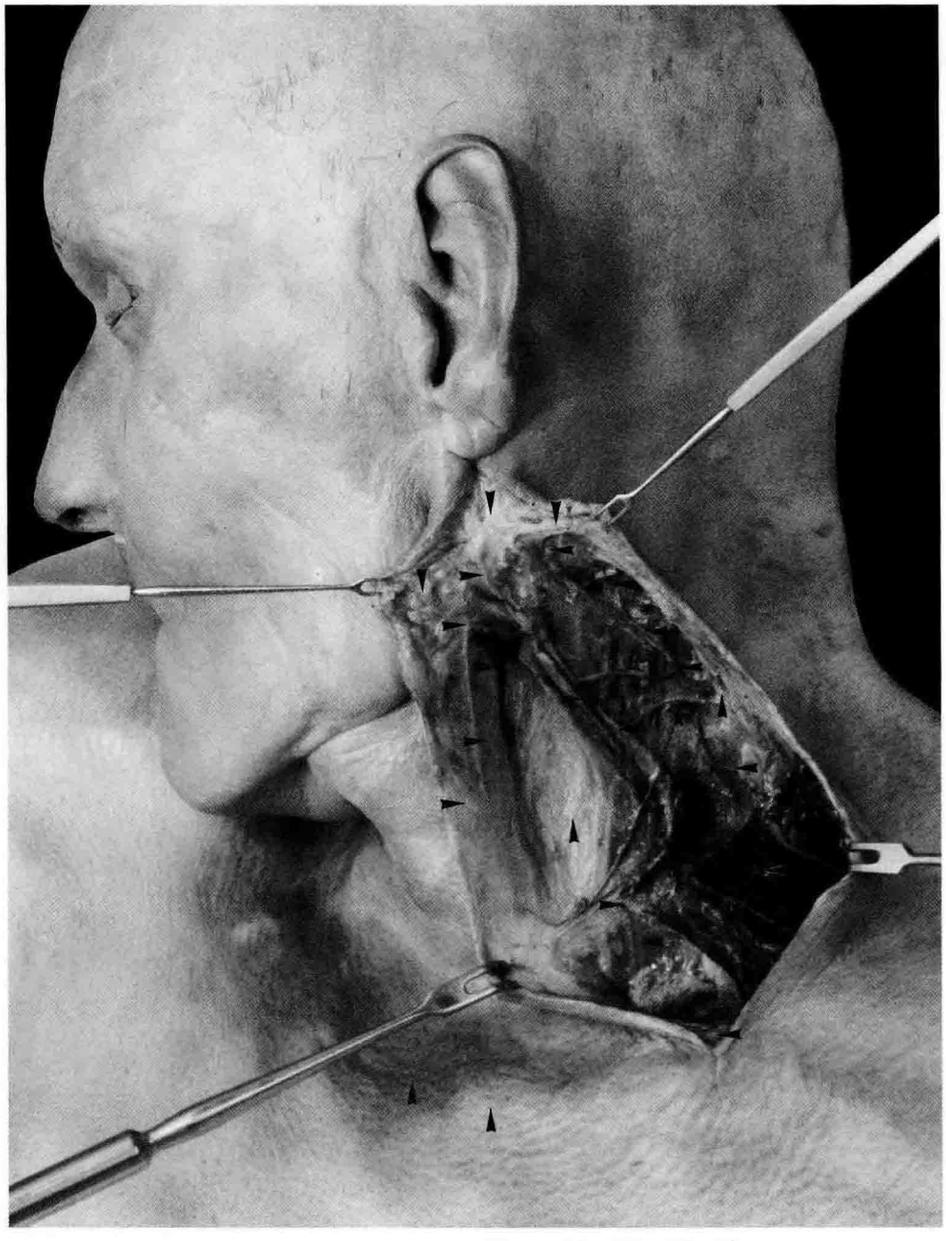
The **platysma** is a muscular sheet lying below the skin of the neck on the plane of the **subcutaneous tissue**, which elsewhere in the body may contain abundant fat. All of the deep surface of this plane is bounded by a fascia-like layer of connective tissue called the **deep layer of the stratum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

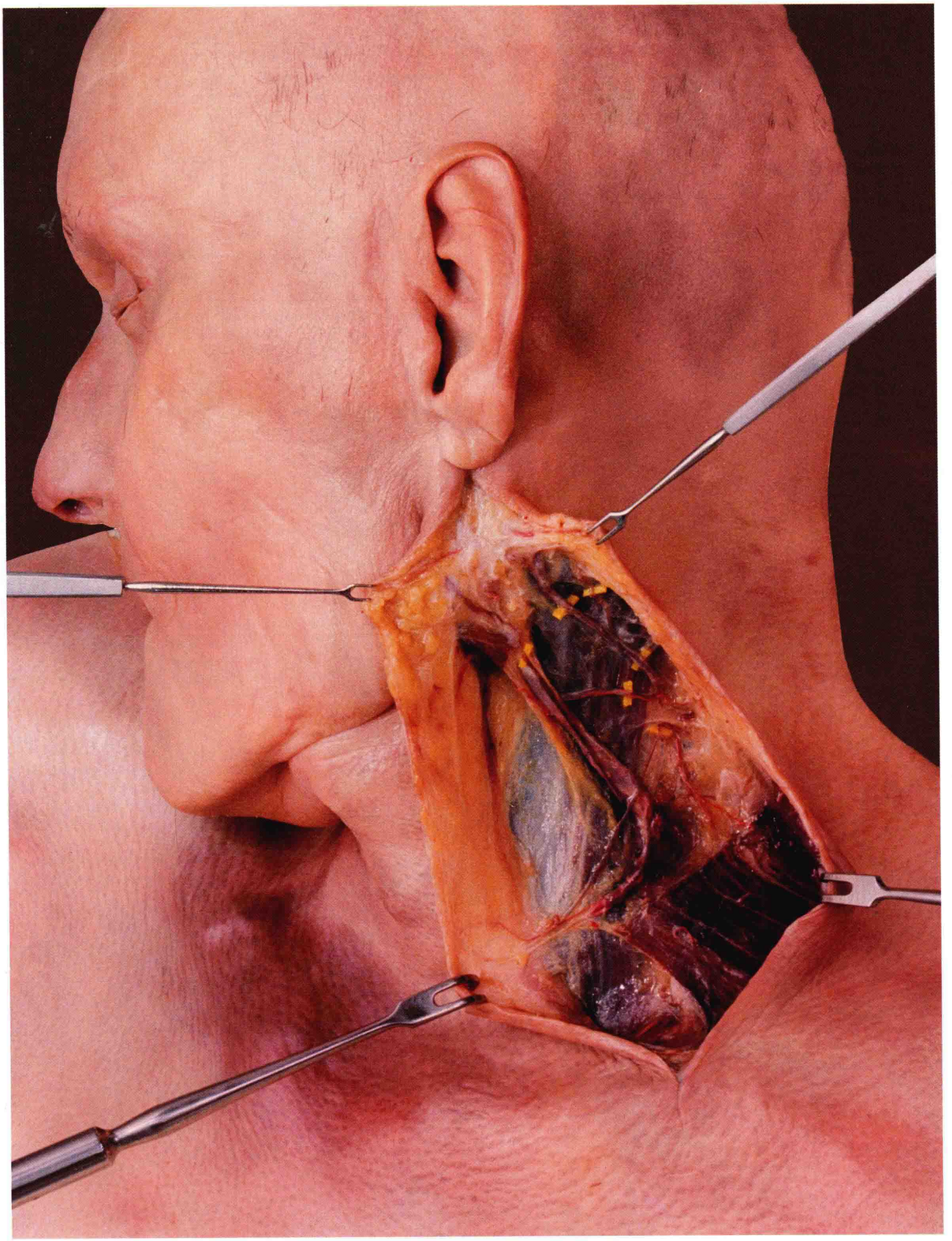


Figure 2 Median Cervical Region 1

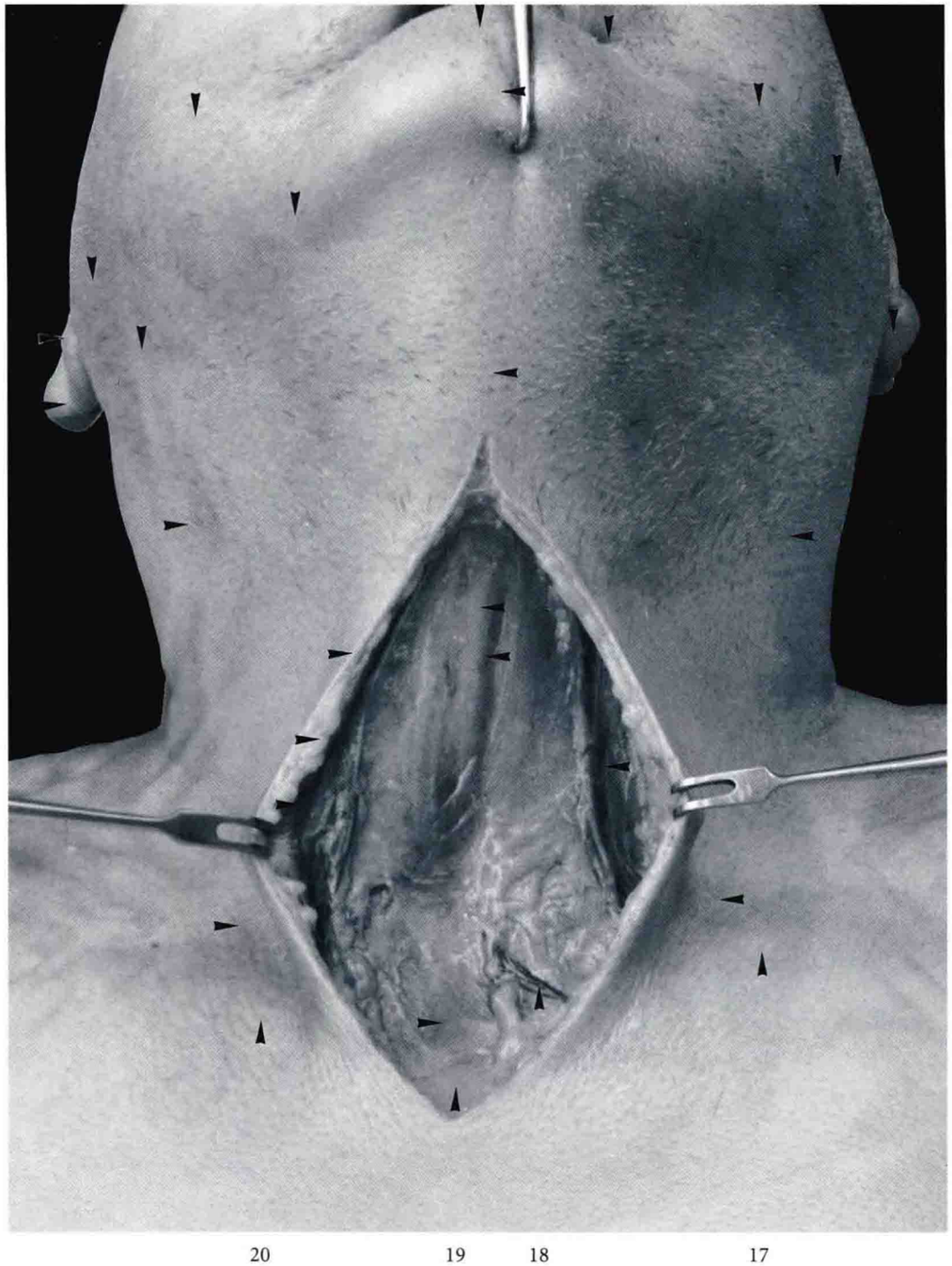
The **median cervical region** assumes practical importance as a site for surgical approaches to the trachea and larynx. It extends vertically from the **hyoid bone** to the **sternum** and is bounded laterally by the **omohyoid** and **sternocleidomastoid muscles**. It corresponds to the **anterior 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

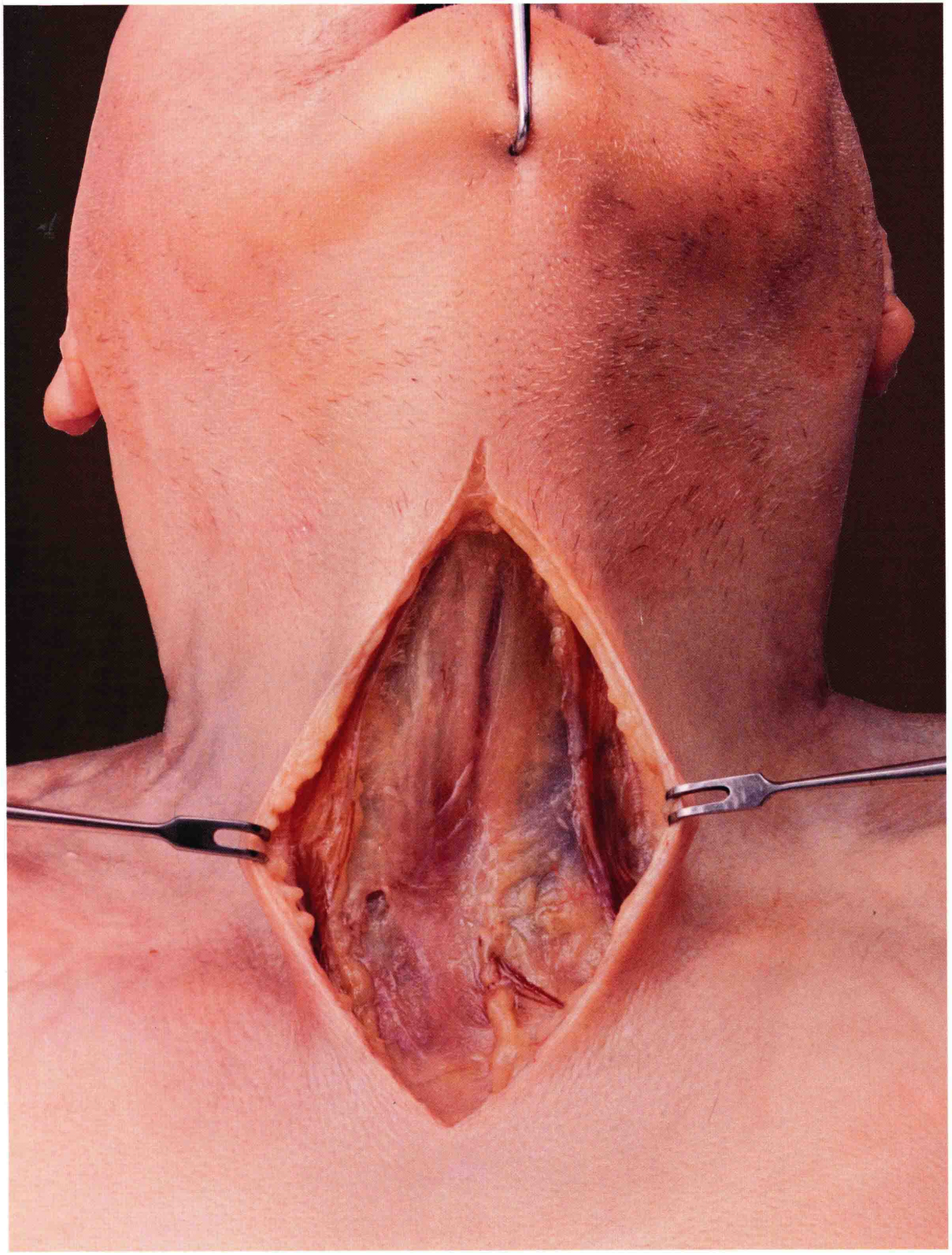


Figure 3 Median Cervical Region 2

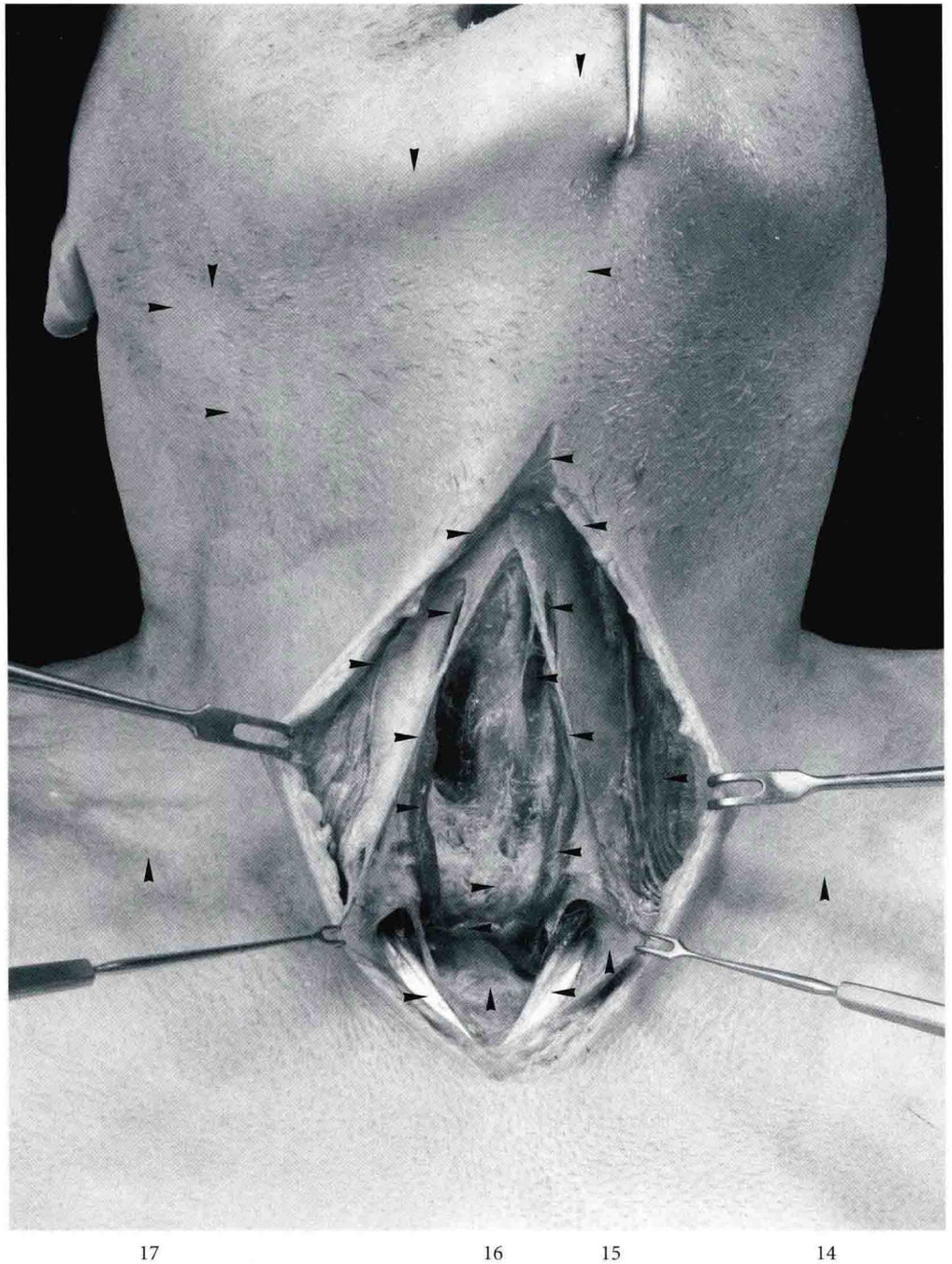
The **skin** and **subcutaneous tissue** have been incised on the midline, dissected from underlying tissues and retracted laterally, and the exposed **superficial cervical fascia** has been opened with a vertical midline incision and its edges retracted. The fascia splits at the **sternocleidomastoid** 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
2 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

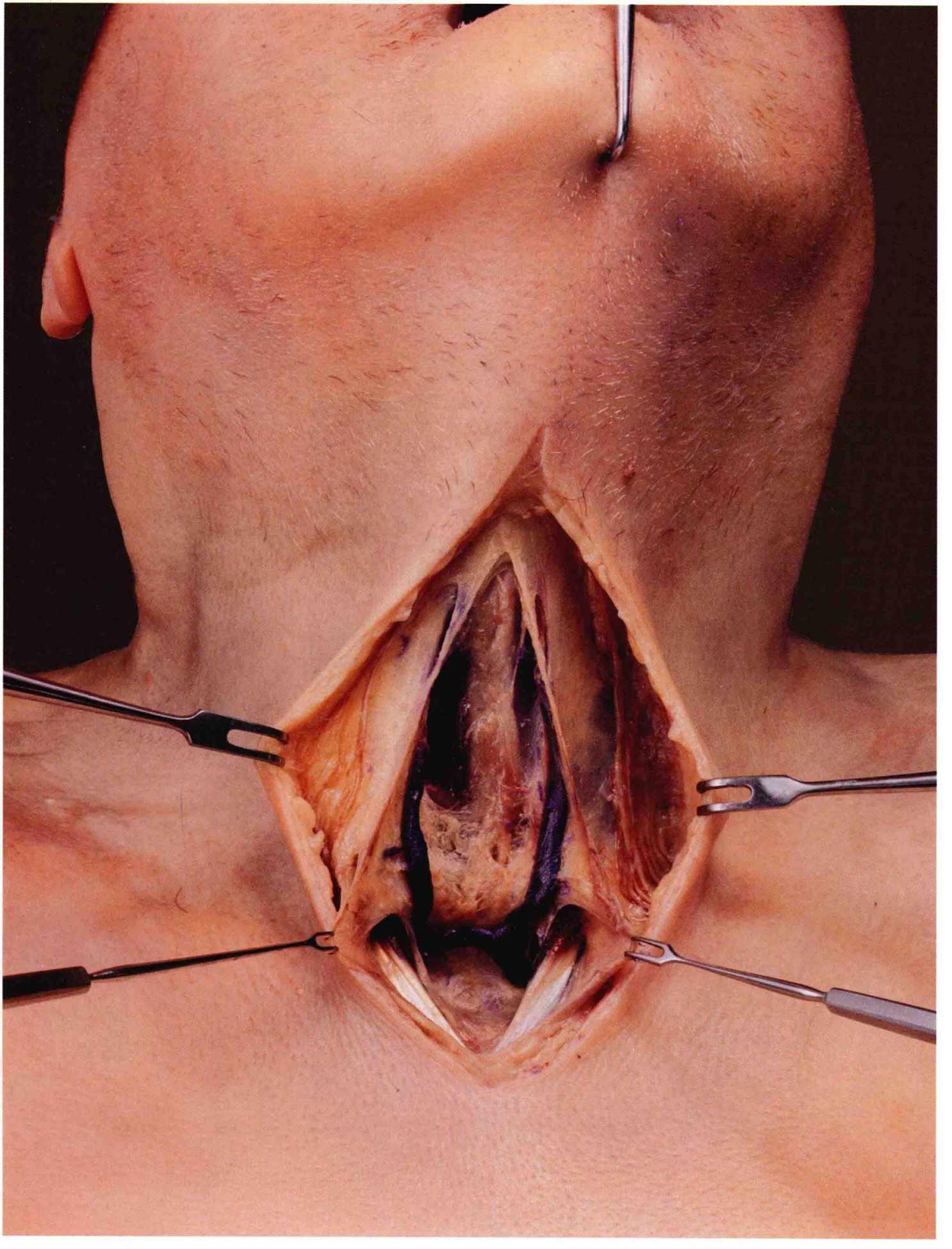


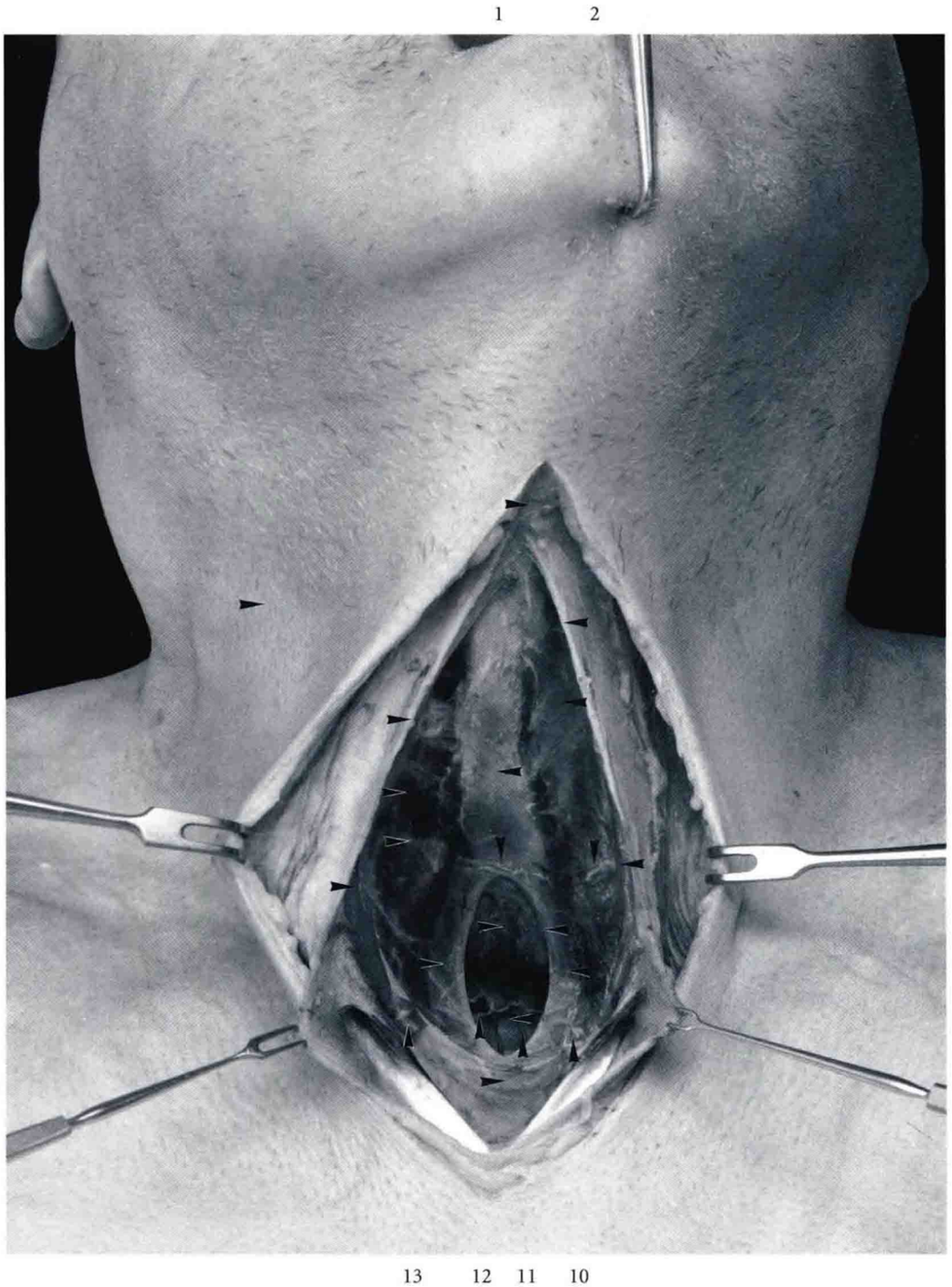
Figure 4 Median Cervical Region 3

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