

Core Messages

- From the anatomic and surgical point of view, the neck is an extraordinarily interesting place. It is like a bridge where fundamental functional units meet and transit. The operating field is on a convenient scale for the surgeon's hands: not so small that it can be explored only with a microscope (like the brain), nor so large as to require ample movements of the arms (abdomen).

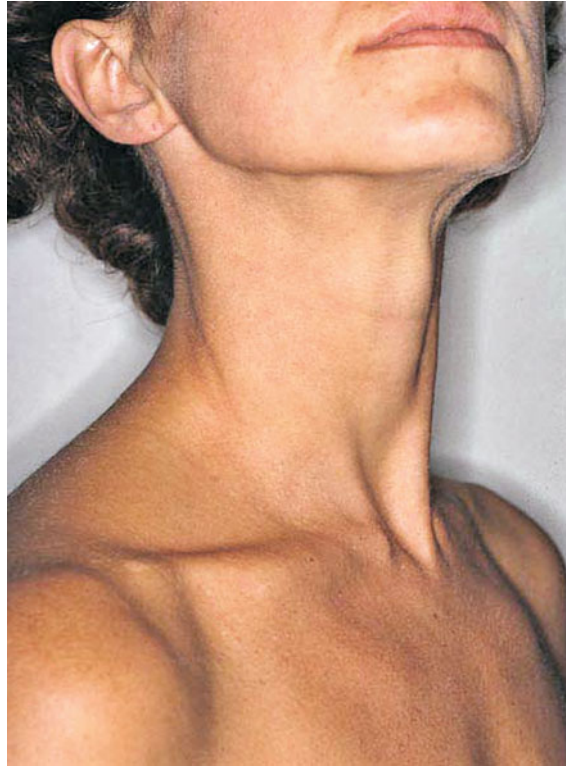
1.1 Prologue

Sul parquet, tra la tavola e la credenza piccola, a terra ... quella cosa orribile ... Un profondo, un terribile taglio rosso le apriva la gola, ferocemente. Aveva preso metà il collo, dal davanti verso destra, cioè verso sinistra, per lei, destra per loro che guardavano: sfrangiato ai due margini come da un reiterarsi dei colpi, lama o punta: un orrore! da nun potesse vede. Palesava come delle filacce rosse, all'interno, tra quella spumiccia nera der sangue, già raggrumato, a momenti; un pasticcio! con delle bollicine rimaste a mezzo. Curiose forme, agli agenti: parevano buchi, al novizio, come dei maccheroncini color rosso, o rosa. "La trachea", mormorò Ingravallo chinandosi, la carotide! la iugulare ... Dio!

("On the floor, between the table and the sideboard, lay a horrible sight ... A ferociously deep red cut opened her throat. Half her neck had been removed, from front to right, that is front to left for her or front to right for any onlookers. It was frayed at the edges as though she had been struck again and again, by a point or blade: what horror! A sight for no eyes! Red strips were showing on the inside, between the blackened, coagulating blood. What a mess! Strange shapes emerged: to the police they looked like holes, to the novice like red or pink macaroni. "The trachea", murmured Ingravallo, bending over her. "The carotid! The jugular ... Oh my God!") [1].

This piece from a high school novel presents a dramatically curious, subtly humorous approach to the neck. Other cervical images that come to mind are the pale, lunar necks in Bram Stoker's original black-and-white screenplay versions of *Dracula*; the "long", ethereal simplicity of Modigliani's necks; or photographs of the ringed necks of Burmese women depicted in *National Geographic*. During a

Fig. 1.1 Carolina's neck



school trip to Castello del Buon Consiglio in Trento, I vividly recollect feeling very uneasy when I saw the unnatural posture of Cesare Battisti's head that had been photographed after execution by hanging.

The neck does indeed conjure up more images than any other part of the body, depending on mode of reproduction. It can inspire the maternal sweetness of sixteenth-century images of Madonna and Child, erotic fantasies of long-legged models on metropolitan catwalks, or anxiety as the strangler's hands close around it in a horror movie. Its versatility probably stems from its being anatomically and conceptually hard to define, and the lack of a material or symbolic identity of its own, compared, say, to the eye or liver. It presents virtual anatomic boundaries, with arbitrary lines rather than natural limits of its own. Its main function of supporting the head has nothing special or exclusive about it. Its true essence seems instead to be its function as a linking structure, a sort of bridge between head and body, transporting blood, air, emotions, and information on movement and sensitivity, that is, it is the point where the "breath of life" converges and is conveyed. We use the neck of a classic ballerina, like Carolina (Fig. 1.1), as a graceful introduction to our dissection class (Figs. 1.2 and 1.3). Let us start by getting to know the superficial landmarks.

Fig. 1.2 Superficial landmarks: lateral view. 1 Zygomatic process of the temporal bone, 2 auriculotemporal nerve and superficial temporal pedicle, 3 caput mandibulae, 4 parotid duct, 5 external auditory canal, 6 angle of mandible, 7 facial pedicle, 8 transverse process of atlas, 9 inferior parotid pole, 10 apex of mastoid, 11 sternocleidomastoid muscle, 12 submandibular gland, 13 apex of greater cornu of hyoid bone, 14 carotid bifurcation, 15 laryngeal prominence, 16 cricoid cartilage, 17 emergence of spinal accessory nerve (peripheral branch), 18 trapezius and entrance of spinal accessory nerve (peripheral branch), 19 inferior belly of omohyoid muscle, 20 external jugular vein, 21 clavicle, 22 sternocleidomastoid muscle (clavicular head), 23 sternocleidomastoid muscle (sternal head)

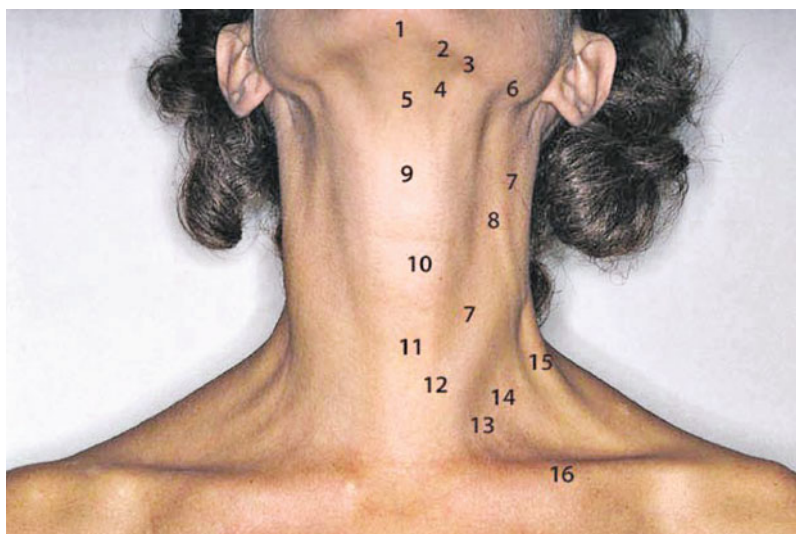
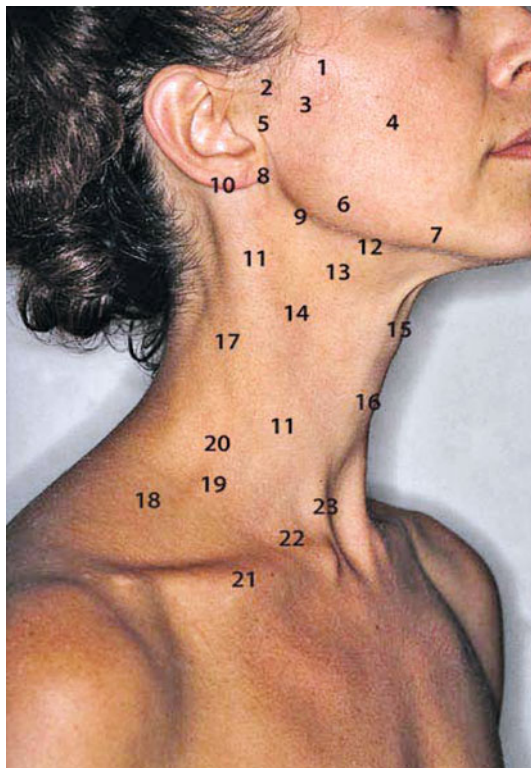
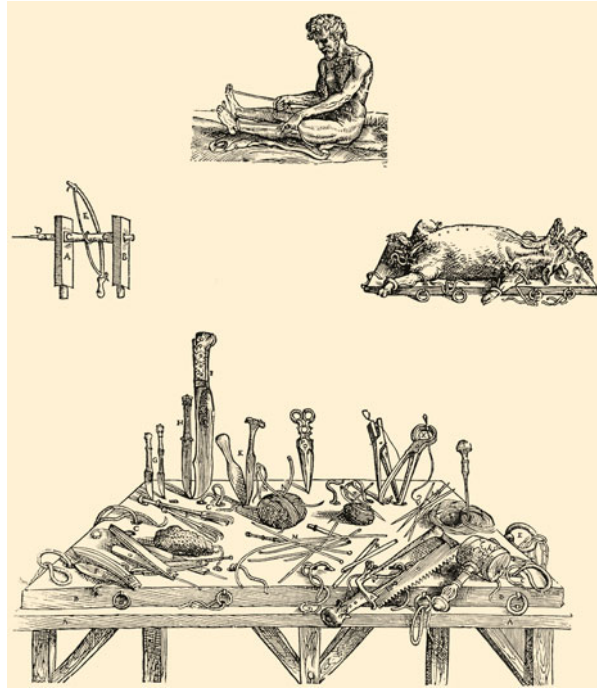


Fig. 1.3 Superficial landmarks: anterior view. 1 Mental eminence, 2 inferior border of mandible, 3 facial pedicle, 4 submandibular gland, 5 hyoid bone, 6 angle of mandible, 7 sternocleidomastoid muscle, 8 external jugular vein, 9 laryngeal prominence, 10 cricoid, 11 isthmus of thyroid gland, 12 sternocleidomastoid muscle (sternal head), 13 sternocleidomastoid muscle (clavicular head), 14 inferior belly of omohyoid muscle, 15 anterior border of trapezius muscle, 16 clavicle

Fig. 1.4 Sixteenth-century dissection instrumentation



1.2 Releasing a Corpse for Research Purposes

Over the eras, in accordance with political and religious precepts, precise restrictions, in many cases prohibitions, have been placed on scientific research on corpses.

In the Western world in particular, Christian and Jewish culture condemned autopsy by virtue of the belief that “the human body is sacred since it was created in God’s image and likeness,” and because it was “contrary to Christian dogma on the resurrection of the flesh” [2]. Consequently, records on anatomic practice are only available from the thirteenth century onwards. Scientists, anatomists, and fine arts students were thus forced either to bribe gravediggers and cemetery guards in order to obtain the anatomic material they required or to perform dissections on animals (Fig. 1.4).

A chronicler of the time wrote of the anatomist Jacques Dubois (1478–1555): “Having no manservant, I saw him carry alone the uterus and intestine of a goat, or the thigh or arm of a hanged man, on which to perform anatomic dissections, which produced such a stench that many of his students would have vomited, had they been able” [3]. Even the University of Padua, one of the most famous in Europe in the early sixteenth century, was allowed a quota of two corpses, one male and one female, on which to practise dissection, thanks to a specific privilege granted by the



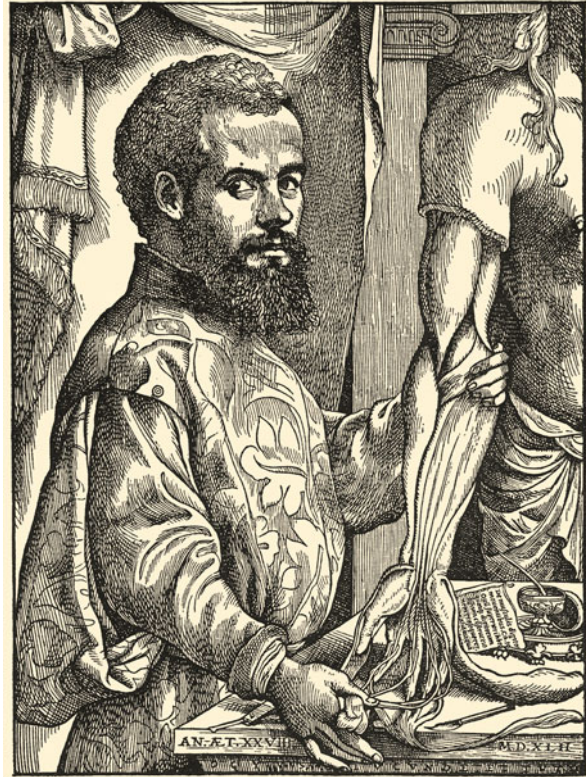
Fig. 1.5 Anatomy Theatre, Palazzo del Bo, Padua

Church. However, the chronicles of the period speak of the secret conveyance of the bodies of hangman's victims through an underground river passage leading directly to the Anatomy Theatre of Palazzo del Bo, where Andreas Vesalius taught for 5 years (Figs. 1.5 and 1.6).

The sixteenth century was the century of the great anatomists, and Vesalius stands head and shoulders above them all. With the Renaissance, anatomy moved away from the religious and dogmatic doctrines that had dominated the Middle Ages and was subordinate to the neutral observation of natural phenomena. Vesalius was therefore the successor of Galen, just as in physics Copernicus took over from Ptolemy. With Vesalius, anatomical science officially became an essential part of the experimental method. In teaching, "Vesalius's reform" meant the replacement of a method of teaching anatomy based on books and dogma with another, revolutionary method, based on the practice of direct and systematic dissection, and therefore more "faithful to anatomical reality". In 1543, Vesalius published the first great modern treatise on anatomy, *De Humani Corporis Fabrica*, an educational text with very clear text and illustrations. He was helped by painters such as Jan Stephan van Calcar, a student of Titian, and the drawings were transferred into woodcuts by Valverde. The frontispiece of the *Fabrica* is in the Academy of Medicine in New York; it shows a lesson held by Vesalius in the Anatomy Theatre of Padua University (Fig. 1.7).

Anatomic dissection has always been considered a fundamental subject for the teaching of medicine. Nevertheless, in European degree courses in medicine and

Fig. 1.6 Andreas Vesalius



surgery, in recent decades there has been a drastic reduction in the hours, methods, and contents of the teaching of human anatomy and in particular of the hours of practical lessons. However, there has recently been a renewed interest in the subject, and it is usually specialists in surgery who want to perfect their surgical techniques on cadavers or learn new ones. For this reason, there is a growing offer of courses in surgical anatomy on cadavers.

In Italy, the use of corpses for research purposes is considered a legitimate practice, albeit governed by specific state legislation; reference should be made in particular to the Consolidation Act on Higher Education Legislation (1933) and the Mortuary Police Regulations (1990).

First, the place of dissection is established, that is, at a university institution. Theoretically, the law permits hospitals to request parts of corpses from university institutions, but, in practice, the excessive bureaucracy involved makes such requests prohibitive (suffice it to consider the transportation of corpses or parts of them).

Regarding the selection procedure for cadavers for teaching and research purposes, Italian legislation allows only the following: corpses admitted to forensic investigation (through the courts) but not requested by family members (excluding



Fig. 1.7 Frontispiece of *De Humani Corporis Fabrica*, 1543

suicides) and corpses for whom transportation has not been paid by the respective family but has been provided free of charge by the local authorities.

Anyone during his or her lifetime can donate by a living will the entire body for teaching and research purposes. This is not, however, a customary practice in Italy. Indeed, in order to have several corpses simultaneously, the three editions of the Practical Course in Neck Dissection (1991, 1992, and 1994), edited by the ENT team of Vittorio Veneto, were carried out in Brussels, Belgium, where the decision to leave one's own body to medical science is a far more common practice. This probably derives from the fact that in other European countries and in the United States, the law has already approved and regulated this possibility for several years now.

Our hypothetical dissection class therefore takes place in a university institution of normal human anatomy or pathologic anatomy. A diagnosis has recently been formulated for the corpse before us; hence, at least 24 h have passed since time of death, and rigor mortis is resolving. We have already ascertained the absence of disease and previous surgical operations on the neck in the structures to be dissected. We are very fortunate if the person in question was fairly tall as this will greatly aid dissection.

1.3 Instrumentarium

Anatomic dissection is a contemplative manual activity. It requires silence and above all should be subject to no time restrictions, as its value is depreciated by hurried performance. Very good lighting conditions are needed and are best provided by scalytic operating lamps. Alternatively, two revolving cold light lamps can be adopted. As a last resort, environmental light focally reinforced by a Clar forehead mirror can be used. Figure 1.8 illustrates the operating instruments that we consider necessary for neck dissection, in addition to a few helpful tools.

Neck dissection may be conducted by a lone surgeon, but this makes it a very awkward task. Two surgeons should instead be involved, alternating with each other in the roles of chief and assistant, thereby promoting efficacy and cultural exchange. The classic error to avoid is to have two surgeons acting separately at opposite sides of the neck.

Last, at the end of dissection, the body should be carefully recomposed. Where possible, unnecessary deforming manoeuvres should be avoided. Consideration and respect should reign at all times towards those who have willingly or unknowingly donated their bodies to science.

Fig. 1.8 Instrumentarium.
1 Septum-type separator,
2 medium surgical scissors,
3 small surgical scissors, 4
disposable scalpel, 5 cocker,
6 surgical forceps,
7 anatomic forceps,
8 self-retaining retractor,
9 silk, 10 three-point hook,
11 medium-sized Farabeuf



Take-Home Messages

- Anatomic dissection is a contemplative manual activity. It requires silence, and haste should be avoided at all costs. It is best to have two surgeons working on the neck dissection, because one has to help the other expose the field and possibly discuss the concepts learned.
- My professor used to say that on the learning scale, it is one thing for a surgeon to find a structure and know how to recognise it, while it is quite a different thing to look for that structure in the precise place where he is sure to find it.

References

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