

2. The Lips

Overview and objectives of this dissection

The principal aim of this dissection is to observe the muscles that are used for moving the lips, shown in figure 2.1.

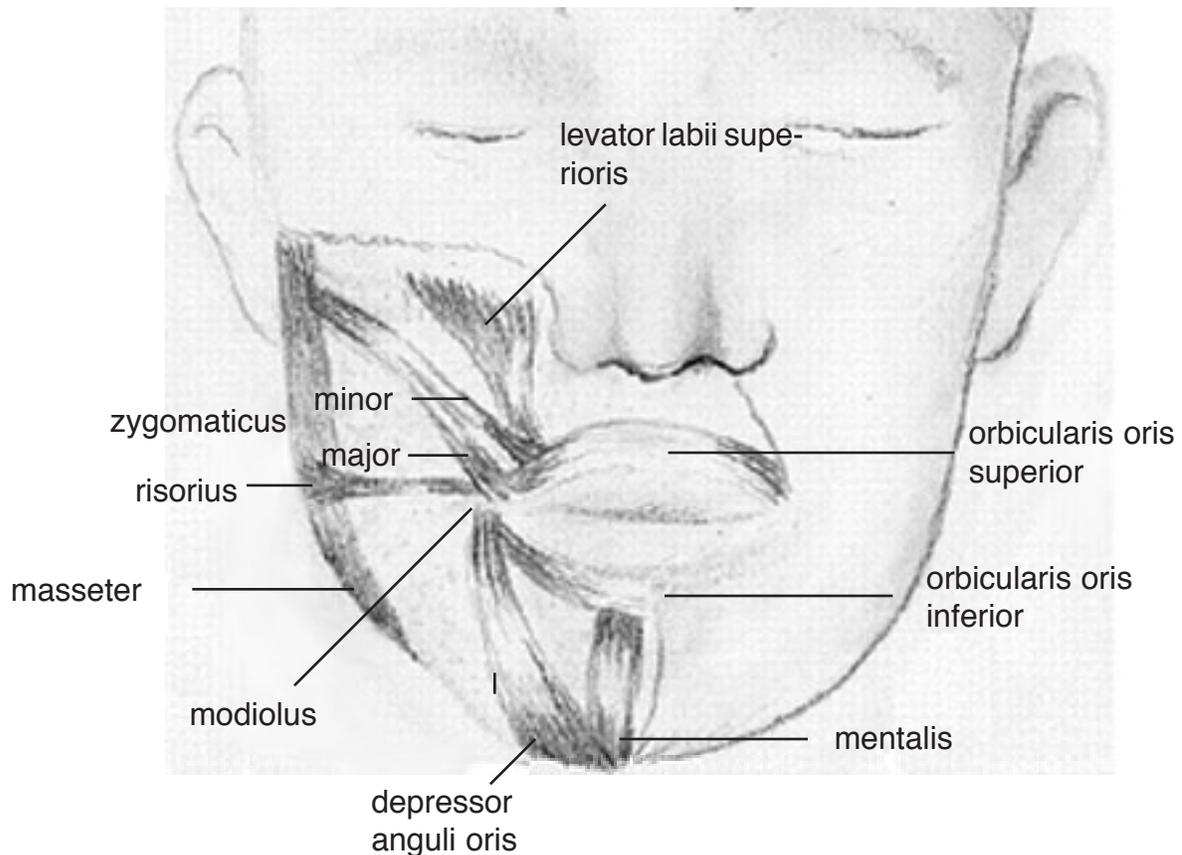


Figure 2.1. Muscles for moving the lips.

From a phonetic point of view there are three major movements of the lips:

(a) *Rounding-spreading* (the corners of the lips are drawn together or pulled apart). Rounding is achieved largely by the action of the **orbicularis oris muscle**, (the muscle that encircles the lips). This is a sphincter muscle, a circular band of muscle fibers that constrict an opening, like a purse string. It acts in opposition to the **zygomaticus major** (and minor), the buccinator, and the **risorius** muscles (the muscles that extend outward and backward from the lips) all of which are dilator muscles, enlarging the opening.

(b) *Protrusion* (the lips are pushed forward, making the vocal tract longer). Protrusion involves the lower lip more than the upper. For the lower lip, the mentalis and the **depressor labii oris**, the muscles from the lips to the chin play the major roles. The turning of the upper lip outward is achieved by the **levator labii superioris** and the **zygomaticus minor** (muscles

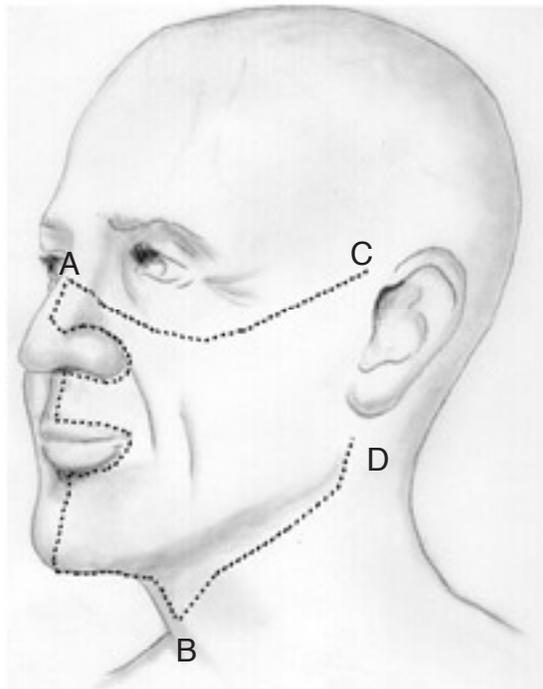
extending upward and backward from the upper lip).

(c) (*Vertical*) *Compression* (the lips come together, mainly by the lower lip being raised). Vertical compression occurs without lip rounding, mainly by raising the lower lip while raising the jaw (see next chapter for jaw raising). Some vertical compression can be achieved without raising the jaw by the actions of the inferior part of the orbicularis oris muscle (the muscle encircling the lips) and the mentalis muscle (the muscle from the lower lip to the chin).

The major anatomical structure to observe in this dissection is the **modiolus**, the point near the corner of the lip where a number of muscles come together. The muscles to be identified are illustrated in Kahane and Folkins (1984), chapter 11. Note in particular their figures 11-3, 11-4, 11-5 and 11-11, all of which contain photographs of excellent dissections that students should try to replicate. Their figure 11-7, showing the way in which the facial muscles blend into one another, is a salutary reminder of the difficulties of achieving dissections showing the separate muscles.

Dissecting the lip muscles

The dissection of the facial muscles is particularly difficult because the muscles are close to the skin and may not be easily distinguished from the surrounding tissue. Do not worry too much about accidentally cutting a muscle, being unsuccessful in finding a muscle or having difficulty distinguishing among the muscles. In short, the goal of this dissection is



to have a good general picture of the structure of the facial muscles, rather than identifying any one muscle.

Figure 2.2 Skin incisions required for dissection of the facial muscles.

1. Make three incisions on the cadaver's face, as shown in Figure 2.2

Make incision AB in the midline from the nose down to the previously cut skin at the level of the clavicle. The incision should go around the nostrils and lips.

Make incision AC from the midline to a point just in front of the top of the ear, going below the eye. Alternatively, incision AC may be made up to the eye. Then you can observe that the muscle surrounding the eye socket is the same kind of "purse string" muscle as the muscle surrounding the lips.

Make incision BD on the side of the face below the angle of the mandible.

2. Reflect the skin, beginning at either the clavicle, the nose, or the ear. The best location for beginning this dissection will vary with the cadaver and the skill of the dissector. You may have to change your approach to the dissection. Suggestions are:

It is easier to begin in the area of the cheek where there will probably be considerable subcutaneous fat that makes the removal of the skin easy.

It is more difficult to work nearer the lips because the muscles are directly attached to the skin. You may decide not to remove the skin from around the lips until you are ready to observe the muscles in step 6.

In all cases point the blade of the scalpel towards the skin, to avoid damaging the muscles immediately below. Also, try to reflect the skin back in one piece, as much as possible, so that the skin may be used to cover the face after the dissection.

3. Remove the parotid gland (a salivary gland) and the fatty pads above the zygomaticus major muscle in the region of the cheek. Note the seventh (facial) nerve, which goes through the parotid gland.
4. Locate the zygomaticus major muscle which connects the zygomatic arch (the cheekbone) to the upper lip. Follow the zygomaticus major from its origin on the zygomatic arch down to its insertion into the modiolus near the corner of the lip, as shown in Figure 2.2. The modiolus is the point at the corners of the lips where several muscles converge.
5. Find the other muscles that join at the modiolus. Six muscles come together at the modiolus: (1) the zygomaticus major, (2) the orbicularis oris (both the superior and inferior muscles), (3) the levator anguli oris, (4) the risorius, (5) the buccinator and (6) the depressor anguli oris. The movements of the modiolus are central to the actions of lip rounding and lip spreading.

The orbicularis oris muscle is the "purse string" muscle surrounding the lips.

The levator anguli oris muscles and the risorius muscles are close to the zygomaticus major. The risorius may be very thin or even absent.

The fibers of the buccinator muscles (one of the muscles of the jaw) also insert into the modiolus. The buccinator is deep to the zygomaticus major, and will be apparent only after all the fatty pads of the cheeks have been removed.

The depressor anguli oris muscles extend from the chin to the lower lip.

6. Finish removing the skin on the upper lip, and try to identify the following muscles: the superior portion of the orbicularis oris, the levator labii superioris, the zygomaticus minor and the levator labii superioris alaeque nasi. These last three muscles can be used to raise and (to a small extent) protrude the upper lip.
7. Finish removing the skin around the lower lip and note how the fibers of the orbicularis oris surround the lips, enabling it to have a kind of purse string action. Students may also wish to observe the orbicularis muscle around the eye. These two muscles are also called sphincter muscles.
8. Locate the two muscles involved in the protrusion of the lips, the depressor labii inferioris and the mentalis. Find the origin of the depressor labii inferioris muscle on the mandible, and its insertion into the orbicularis oris. The mentalis connects the lower lip to the chin. To find the mentalis cut in the midline below the lower lip to the mandible itself, thus splitting the fatty pad forming the chin. The mentalis will also be split and may be observed along the cross-section under the fatty pad.