# Laser Skin Resurfacing, Chemical Peels, and Other Cutaneous Treatments of the Brow and Upper Lid

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**KEYWORDS**

• Laser resurfacing • Chemical peels • Aging face • Facial rejuvenation
• Noninvasive cosmetic surgery

**KEY POINTS**

- Evaluation and treatment of the eyebrow and upper eyelid must include thorough appreciation of their relationship to the forehead and periorbital complex.
- The upper third of the face consists of the forehead, temples, glabella, eyebrows, and upper eyelids, with varying skin textures, and many important skeletal landmarks and interconnecting muscle groups.
- A thorough past medical and surgical history as well as review of all topical and oral medications and allergies is imperative when evaluating a patient for potential rejuvenative treatment.
- Dermabrasion, chemical peels, laser, light, and energy devices, as well as neuromodulation and fillers, are used to varying degrees as first-line resurfacing and rejuvenation techniques for the eyebrow and upper eyelid.

## INTRODUCTION

The focus of this article is treatments of the brow and upper lid; yet, one cannot evaluate and treat these target areas without appreciating their relationship to the forehead and periorbital complex.

With age, there is a loss of the supporting framework of collagen, elastin, and hyaluronic acid, as well as losses of bone and fat. Increased skin laxity results, with redundancy, accentuated skin folds, and uneven texture. Nature's course can be further expedited by exogenous factors, such as chronic sun exposure, cigarette smoking, and other insults to the skin and underlying structures, resulting in further wrinkling and dyspigmentation.

Resurfacing of the skin of the brow and upper lid may be achieved by mechanical dermabrasion, application of chemical peels, laser surgery, and treatment with energy devices, including radiofrequency and focused ultrasound. We focus on treatments designed to stimulate collagen synthesis, as well as improve fine lines, wrinkles, and overall appearance of the skin.

## ANATOMY OF THE UPPER EYELID, EYEBROW, AND FOREHEAD

The upper third of the face consists of the forehead, temples, glabella, eyebrows, and upper eyelids.[1] We focus on the skeletal landmarks,

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muscles, and skin and subcutaneous tissue of the upper lid, brow, glabella and forehead for our purposes here.

### Skeletal Landmarks

Bony landmarks of this anatomic location include the following[1]:

- lateral, supra, and infraorbital margins
- supra and infraorbital and zygomaticofacial foramina
- superciliary and zygomatic arches
- superior and inferior temporal lines
- frontal and malar eminences

The supraorbital margin is composed of the frontal bone with the often palpable supraorbital notch, or foramen, located approximately 2.5 cm (ranging from 1.5 to 3.8 cm) from the facial midline.[1] This is where the supraorbital nerve exits the orbit to join the supraorbital artery and vein and innervate the forehead, scalp, and upper eyelid.

The superciliary arch lies above and parallel to the supraorbital margin, underneath the eyebrow and above the frontal sinus. This arch may be absent in women. Above this arch, the frontal eminence of the anterior scalp and forehead may be palpable.

The infraorbital margin is composed medially of the maxillary bone and laterally by the zygomatic bone.

Approximately 2.5 cm from the facial midline and 1.0 cm inferior to the infraorbital rim is the infraorbital foramen, where additional vessels and nerve are located.

Laterally, the frontal process of the zygomatic bone forms the orbital margin.

Along the supralateral rim, across the temple and parietal scalp, it is possible to palpate the superior attachment of the temporalis muscle. It is at this point of attachment that the inferior and superior temporal lines on the frontal and parietal bones may be noted.

Although the supraorbital and infraorbital and lateral orbital margins are distinctly defined by bony structures, the medial orbital margin is less so, being formed by the frontal bone superiorly and maxilla inferiorly.

The cheekbone, or malar eminence, is formed by the zygomatic bone, with its fullness attributed to the overlying buccal fat pad.

The widest part of the cheek, and face, is the zygomatic arch, formed by the temporal process of the zygomatic bone and the zygomatic process of the temporal bone. It is located between the malar eminence and superior border of the external auditory meatus.

### Muscles

The muscles of the eye, including the upper eyelid, consist of the following[1]:

- orbicularis oculi
- procerus
- corrugators supercilii
- levator palpebrae superioris

The orbicularis oculi muscle complex is one of the superficial muscles of facial expression, lying beneath and acting on the eyelid and periorbital skin. The voluntary and involuntary palpebral portion of the muscle overlies the tarsal plate and orbital septum, and may act independently of or together with the purely voluntary orbital portion. This latter portion originates superiorly on the anterior part of the supraorbital rim, medial to the supraorbital foramen, and connects with other superficial muscles of facial expression. These include the frontalis, procerus, and corrugators supercilii superiorly; the superficial temporalis fascia laterally; and the muscles of the quadratus labii superioris and the zygomaticus complex inferiorly. The upper pretarsal and preseptal muscles depress the upper lid, whereas the levator palpebrae superioris muscle contributes to the raising of the upper eyelid. It is the fibrous elements of this muscle aponeurosis that create the smooth, taut appearance of the eyelid margin skin.[1]

The glabellar complex consists of the corrugator supercilii and procerus muscles. The corrugator supercilii is small and deep, originating from and located directly on the frontal bone of the medial superior orbit. The repeated activity of this muscle is responsible for the vertical furrows, or “11 lines,” located at the root of the nose. This muscle inserts into eyebrow skin and interdigitates with the frontalis and orbicularis oculi. In fact, a part of this muscle is derived from fibers of the orbital portion of the orbicularis. As a brow depressor, contraction draws the eyebrow downward and medially, resulting in a “scowl.” The procerus muscle originates at the lower nasal bone and nasal cartilage, attaching to the skin at the nasal root. Its fibers similarly are interwoven with the frontalis, orbicularis oculi, and corrugator supercilii. Contraction of this muscle results in inferior movement of the forehead and eyebrows. This muscle is responsible for the transverse wrinkles at the root of the nose and the “bunny lines.”

Eyebrows are elevated and held in position by the main forehead muscle, the frontalis. This muscle originates in the galea aponeurotica just at the anterior hairline, with insertions into the skin of the forehead and eyebrows, as well as with the orbicularis oculi and glabellar complex. Contraction raises the