I. BROW LIFT (Figures 1 and 2)

A. Open Coronal Brow Lift Technique
   1. Coronal incision is made in the hair-bearing skin
   2. Scalp flap is elevated caudally in a variety of planes towards the orbits, allowing broad exposure of the brow attachments, which can be released and repositioned

B. Endoscopic Brow Lift
   1. Endoscopic ports are made in the hair-bearing skin and endoscopic instruments are used to release the brow attachments under direct camera visualization
   2. The repositioned brow is secured to the bone and/or periosteum through a variety of methods.

C. Hairline Brow Lift
   1. Incision is made along the hairline and a flap is elevated caudally towards the orbits, the brow attachments are released, and the brow is repositioned.
   2. Excess skin is trimmed along the incision line and the incision is carefully closed.

D. Lateral Brow Lift
   1. Incision is made either in the temple hair-bearing skin or along the temple hairline, dissection proceeds to the lateral eyebrow in a plane deep to the superficial temporal fascia.
   2. The lateral brow is re-positioned, excess skin is excised at the incision line and the incision is carefully closed and secured to the deep temporal fascia.

E. Direct Brow Lift
   1. Incision is made in the superior border of the eyebrow and a pre-determined amount of forehead skin is excised between the brow incision and new desired location for the eyebrow.
   2. Once the intervening skin tissue is excised, the incision edges are carefully approximated.

II. NON-SURGICAL (CHEMICAL) BROW LIFT

A. A temporary brow lift can be performed with neuromodulators (Ex. Botox or Dysport) by selectively treating the medial and lateral brow depressor muscles
Figure 1. Incision placement for temporal brow lift
From Codner et al. Blepharoplasty & Brow Lift, Plast Reconst Surg CME. July 2010; 126(1).

Figure 2. Anatomical position of the sentinel vein, temporal branch of facial nerve and ligamentous attachments
III. FACELIFT

A. Facial Aging surface anatomy (Figure 3)
   1. The human face will age in predictable patterns
   2. Common patterns of aging
      a. Descent and deflation of the midface
      b. Development of a prominent tear trough
      c. Deepening of the nasolabial fold
      d. Flattening and lengthening of the upper lip
      e. Development of jowls
      f. Laxity in the neck skin and platysma muscle

Figure 3. Surface anatomy of the male and female face
(Left) The average of facial surfaces of 116 female subjects aged 20-30 years. (Right) The average of facial surfaces of 100 female subjects, aged 68-91 years (average 76 years). Photographs courtesy of Val Lambros, MD.


IV. FACELIFT ANATOMY

A. Facial Nerve: 5 motor branches which start deep in the lateral face and ascend superficially as they travel medially in the face.
   1. Frontal
   2. Zygomatic
   3. Buccal
4. Marginal Mandibular
5. Cervical

B. Facial Retaining Ligaments

Figure 4. Fresh tissue dissection demonstrates the location of the facial nerve branches and facial artery. Note the location of the branching point of the cervical motor nerve below the mandible and its relation to the angle of the mandible. 


C. SMAS (Superficial Musculo-Aponeurotic System)
   1. Superficial muscle-fascial layer in the head and neck
   2. Originates as the platysma in the neck and extends superiorly as a fascial layer just below the subcutaneous fat in the face. Terminates superior to the zygoma as the superficial temporal fascia (aka Temporoparietal Fascia).

V. FACELIFT OPERATIVE TECHNIQUES

A. Subcutaneous only
   1. The facial skin is widely undermined and re-draped. The SMAS is not addressed in this technique.
B. SMAS plication
   1. The facial skin is undermined and the SMAS tissue is sutured together in order to tighten and reposition the SMAS architecture.
C. SMAS-ectomy
   1. The facial skin is undermined and an oblique piece of SMAS is excised, the cut edges of the remaining SMAS are then sutured together.
D. Extended SMAS
1. The facial skin is undermined and a separate flap of SMAS is elevated and sutured superior-laterally to reposition the SMAS.

E. Composite / Deep Plane

1. A limited amount of facial skin undermining is performed and then the SMAS and skin are left adherent to each other as a “composite flap” while a sub-SMAS dissection is performed. Once the composite flap is adequately mobilized, it is repositioned and excess skin/tissue is trimmed.

Figure 5. Ninety degree SMAS plication (left); Extended-SMAS (right)
VI. FACELIFT COMPLICATIONS

A. Hematoma
B. Facial Nerve Injury
   1. The most common branch injured is the buccal branch however cross-innervation from adjacent nerve branches decreases the long-term morbidity of buccal branch injury.
   2. Injury to the frontal branch or marginal mandibular branch result in significant morbidity because they do not have significant cross-innervation from adjacent nerves.
C. Skin sloughing (secondary to excess tension on the skin flap)

VII. BLEPHAROPLASTY

A. Anterior Lamella Anatomy
   1. Skin
   2. Orbicularis Oculi muscle
      a. Pre-tarsal
      b. Pre-Septal
c. Orbital

B. Posterior Lamella Anatomy
1. Tarsal Plate & conjunctiva
2. Levator Palpebrae Superiors Muscle (upper lid)
3. Muller muscle (upper lid)
4. Orbital Fat
   a. Upper Lid
      i. Medial & Middle fat pads
      ii. Lacrimal Gland is lateral
   b. Lower Lid
      i. Medial, Middle and Lateral fat pads
      ii. Inferior Oblique muscle is between the medial and middle fat pads
5. The orbital septum and orbital fat constitute the middle lamella.

C. Pre-operative evaluation (Upper Eyelid)
1. Eyelid ptosis
2. Brow ptosis
3. Levator and Frontalis muscle function

D. Pre-operative evaluation (Lower Eyelid)
1. Eyelid laxity (distraction test)
2. Eyelid tone (snap back test)
3. Vector analysis (positive/neutral/negative)
4. Eyelid retraction & scleral show

VIII. BLEPHAROPLASTY OPERATIVE TECHNIQUES

A. Upper Eyelid
1. Excess skin is excised +/- a strip of orbicularis muscle
2. In certain cases orbital septum is opened and varying amounts of intraorbital fat is excised.
3. Levator surgery can be performed for patients with ptosis

B. Lower Eyelid
1. Approaches
   a. Transconjunctival
      i. Incision is made on the inside of the lower lid through the conjunctiva
   b. Subciliary:
      i. Incision is made just below the eyelashes on the external eyelid skin
2. **Volume Reduction**
   a. In certain cases the intraorbital fat is removed and/or repositioned to blend the lid-cheek junction.

3. **Lateral Canthal repositioning for support**
   a. Canthopexy
   b. Canthoplasty

### IX. BLEPHAROPLASTY COMPLICATIONS

A. Retrobulbar Hematoma
B. Ectropion
C. Lagophthalmos
X. RHYTIDECTOMY AND NECK REJUVENATION

A. Often performed in conjunction with facelift

XI. NECK ANATOMY

A. Pre-Platysma / Subcutaneous Fat
B. Platysma
C. Sub-platysma structures
   1. Submandibular gland
   2. Anterior Digastric muscle
   3. Inter-digastric / Sub-platysmal fat

XII. OPERATIVE TECHNIQUES IN NECK REJUVENATION

A. Anterior Approach
   1. Submental incision
   2. Release of platysmal bands (+/- muscle transection)
   3. Re-approximation of platysma at midline (corset platysmaplasty)
   4. Sub-platysmal structures are addressed if indicated
B. Lateral approach (through facelift incision)
   1. Facelift incision (+/- undermining of neck skin)
   2. Reposition the platysma muscle from a lateral position through a variety of techniques

XIII. ADJUVANT PROCEDURES – FINISHING TOUCHES

A. Fat Grafting
B. Laser Resurfacing
C. Dermabrasion
D. Chemical Peels
E. Implants (chin, jawline, cheek)

XIV. RHINOPLASTY

A. Surface Anatomy & Preliminary Analysis
   1. Skin quality and texture
B. Upper Third
   1. Dorsal Aesthetic Lines
   2. Nasal Bone
   3. Radix
C. Middle Third
   1. Upper Lateral cartilage
   2. Keystone
   3. Internal Nasal Valve

D. Lower Third
   1. Lower Lateral cartilage
   2. External Nasal Valve
   3. Soft Triangle

E. Nasal Septum (also assess for turbinate hypertrophy)

Figure 8. Surface anatomy of the nose
Figure 8. The external and internal nasal valves. The external valve is formed by: (1) caudal edge of the lateral crus of the lower lateral cartilage, (2) soft-tissue alae, (3) membranous septum and (4) nostril sill. The internal nasal valve accounts for ½ of total airway resistance. Borders: (medial) – septum, (inferior) – nasal floor, (lateral) – inferior turbinate.


XV. OPERATIVE TECHNIQUES IN RHINOPLASTY

A. Closed Approach
B. Open Approach
   1. Incisions
      a. Skin
         i. Transcolumellar
      b. Alar
         i. Rim Incision (internal incision at border of alar rim)
         ii. Marginal Incision (internal incision at caudal border of lower lateral cartilage)
         iii. Intercartilagenous (internal between upper and lower lateral cartilages)
      c. Septal
         i. Hemi-transfixion
         ii. Full-transfixion
         iii. Killian incision
   2. Maneuvers
      a. Septoplasty +/- Turbinate reduction
      b. Dorsal hump reduction or augmentation
      c. Osteotomies
      d. Cephalic Trim
      e. Nasal tip re-structuring
      f. Cartilage grafting for shape, contour and/or support
Figure 9. (Left) Width of dorsal and caudal L strut should be at least 15 mm to ensure long-term support. (Right) Tip suturing techniques: (top) medial crural columellar strut suture, (center) transdomal suture, (below) interdomal suture. 

REFERENCES