Dynamic change of frontalis muscle after cosmetic upper blepharoplasty

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Objective

After cosmetic upper blepharoplasty

How is the change of

- Frontalis muscle activity
- Eyebrow height
Materials & Methods

◆ **Patients**
  - 13 female
  - 48-69 years old (mean, 55.5)

◆ **Needle electromyography (EMG)**
  - Invasive procedure that records the electrical activity of individual muscles
  - Anesthesia: Ethylchloride® spray
  - Needle insertion: Teflon coated monopolar
  - Digital photographs: For eyebrow position

Follow up: pre op., post op. 2 wks, 3 m. & 6 m
A. Needle electrode
B. Ground electrode
C. Reference electrode

10 to 20 degree angle to skin
Surface anatomy for needle EMG

- Frontalis muscle:
  - flat and extremely thin
- One-finger’s breadth
  - superior to the orbital margin
- Two-fingers’ breadth
  - from the midline
**Digital photographs: Frankfort’s horizontal plane**

- Eyebrow action: 5 same activities
  1. close eye smoothly
  2. primary gaze
  3. forward gaze
  4. open eye maximally
  5. upward gaze
◆ Analysis: needle EMG

Proportional index = \[
\frac{\text{each eyebrow action RMS(2,3,4,5,)}}{\text{reference eyebrow action RMS (1)}}
\]

◆ RMS(root-mean-square) record: frontalis activity

◆ Analysis: digital photography

Eyebrow height: vertical height between each 4 landmark to eyebrow upper border

Reference horizontal plane: line in between both medial canthus

MC: medial canthus
LL: lateral limbus
LC: lateral canthus
LEP: lateral ending point
CASE (52/F)

Pre op  
Post op 2 weeks  
Post op 3 months  
Post op 6 months
**Results**

**Needle EMG, ANOVA test**
- 4 activities (2, 3, 4, 5):
  - statistically significant decreases in post-op 6 months \( (p < 0.05) \)

**Eyebrow height change, ANOVA test**
- In 4 landmark:
  - no statistically significant changes \( (p > 0.05) \)

![Graph showing proportional index of RMS value compared with 1RMS.](image)
Conclusions

After cosmetic upper blepharoplasty

- Frontalis muscle activity: **decrease in post op. 6 mo.**
- Eyebrow height: **no change**