

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

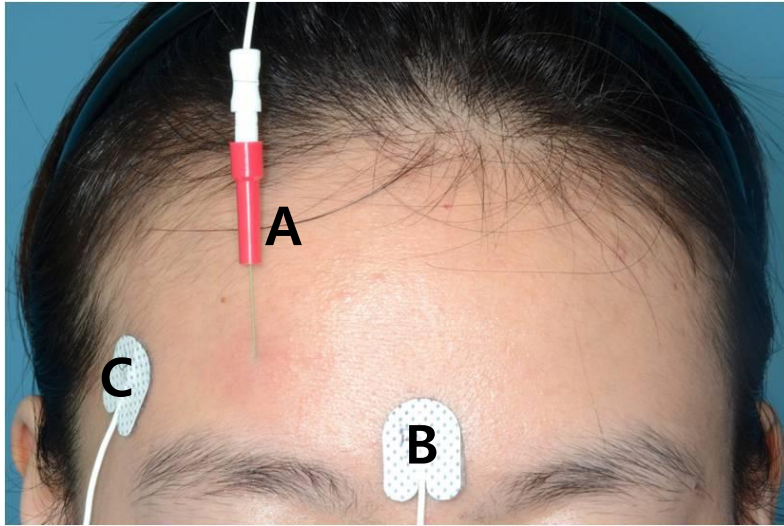
◆ Patients

- 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

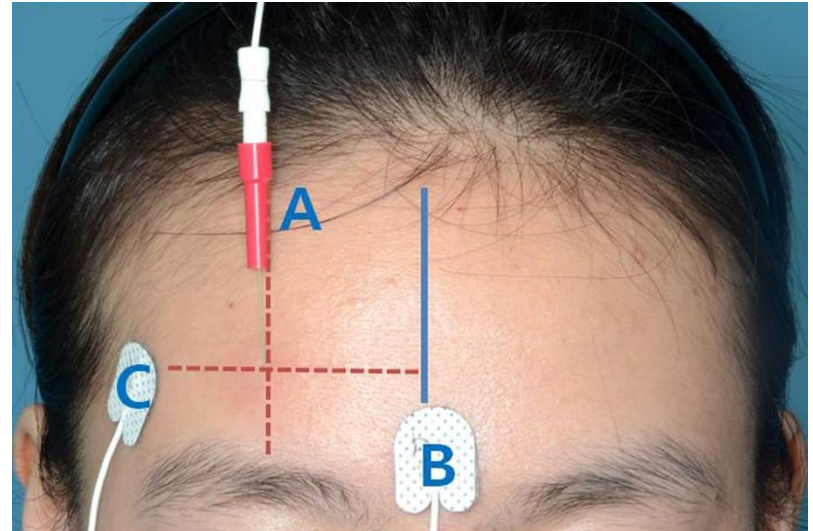


- A. Needle electrode
- B. Ground electrode
- C. Reference electrode

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



1

2

3

4

5

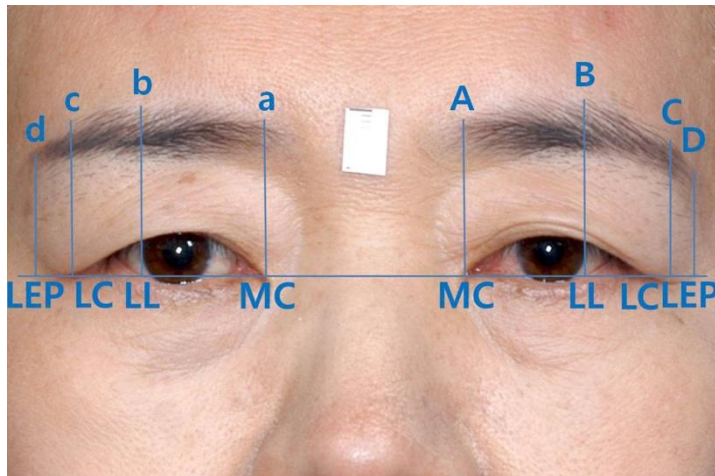
◆ Analysis: needle EMG

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

◆ 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

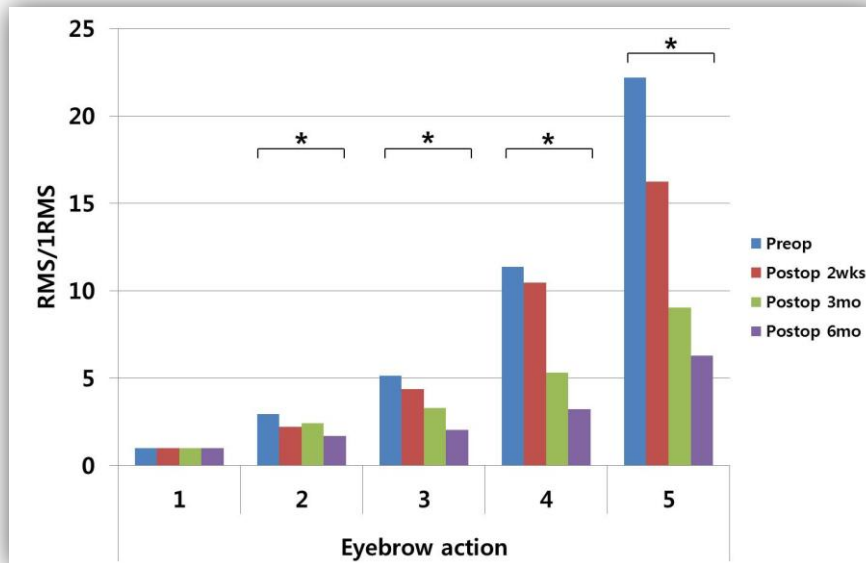
Post op 3 months

Post op 6 months

Results

◆ Needle EMG, ANOVA test

- 4 activities (2,3,4,5):
statistically significant decreases in post-op 6 months ($p < 0.05$)



Proportional index of RMS value compared with 1RMS

◆ Eyebrow height change, ANOVA test

- In 4 landmark:
no statistically significant changes ($p > 0.05$)

Conclusions

After cosmetic upper blepharoplasty

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