Intra-facial Nerve Transfer for Facial Synkinesis: An Anatomical Feasibility Study

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Introduction

Patients with severe oral-ocular synkinesis often present with inefficient smile excursion. In theory, by redirecting nerve fibers to their native muscle by intra-facial nerve transfer, synkinetic eye movements may be reduced and voluntary smile improved. The aim of the study was to explore the anatomical and technical feasibility of selective intra-facial nerve transfer between branches innervating the orbicularis oculi and the zygomaticus major muscle.

Methods

Ten adult fresh cadavers (18 hemi-faces) were dissected. Measurements included

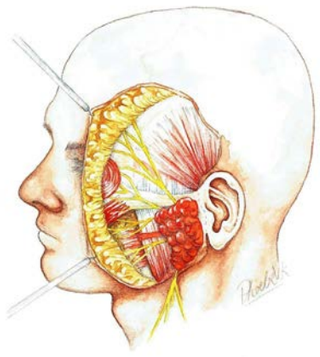
- Number of nerve branches to the orbicularis oculi and zygomaticus major muscle
- Maximal length of nerve dissection and reach for direct coaptation between nerve branches
- Histomorphometric analysis for axonal count was performed

Results

Transection and tension-free coaptation was possible

Caudal branch to the orbiculares oculi muscle
- Lenght 28.3 ± 7.3 mm
- Branches 3.1 ± 1.0
- Histomorphometry 5173 ± 2293 mm^2

Cranial Branch to the zygomaticus Major muscle
- Lenght 23.8 ± 6.5 mm
- Branches 4.7 ± 1.2
- Histomorphometry 5256 ± 1774 mm^2



Conclusion

- Nerve transfer of a caudal nerve branch to the orbicularis oculi muscle to the most cranial nerve branch innervating the zygomatic major muscle was an anatomically feasible procedure
- Potentially a new treatment option in selective patients with moderate to severe Oro-Ocular synkinesis and a weak asymmetrical smile