Hypoglossal nerve facial nerve neurorrhaphy

General information

It cannot be used bilaterally in patients with facial diplegia or in those with other lower cranial nerve deficits (or potential for the same). In spite of some suggestions to the contrary, sacrificing the XII nerve does create some morbidity (tongue atrophy with difficulty speaking, mastication and swallowing in ≈ 25% of cases, exacerbated when the facial muscles do not function on that side; aspiration may occur if vagus (Cr. N. X) dysfunction coexists with loss of XII).

Not as effective as would theoretically seem possible. The resultant facial reanimation is often less than ideal (may permit mass movement). To avoid severe disappointment, the patient should thoroughly understand the likely side effects and that the facial movement will probably be much less than normal, often with poor voluntary control.

Usually performed in conjunction with anastamosis of the descendens hypoglossi to the distal hypoglossal nerve to try and reduce hemiatrophy of the tongue. Atrophy may also be reduced by using a “jump graft” without completely interrupting XII [1)].

Hypoglossal nerve-facial nerve neurorrhaphy is a widely used method for treating complete facial palsy. However, the classic surgical procedure using a “side”-to-end neurorrhaphy is not suitable for incomplete facial palsy (IFP), because sectioning of the facial nerve for neurorrhaphy compromises remnant axons and potential spontaneous reinnervation.

Complete section of the hypoglossal nerve occasionally results in hemiglossal dysfunction and interferes with swallowing and speech. To reduce this morbidity, a modified technique with partial section of the hypoglossal nerve after mastoid dissection of the facial nerve (HFM) has been used.

HFM is as effective as classic hypoglossal-facial neurorrhaphy for facial reanimation, and it has a much lower morbidity related to tongue function. Better results are obtained in younger patients and with a shorter interval between facial nerve injury and surgery [2)].

A study demonstrates that hypoglossal-facial nerve “side”-to-side neurorrhaphy with a predegenerated nerve graft can lead to rapid functional benefits for persistent IFP without compromising the remnants of facial axons, thus providing a proof-of-feasibility for further studies in humans [3)].

To improve Axon regeneration, Zhang et al used for the first time a predegenerated sural autograft for performing HN-FN 'side'-to-side neurorrhaphy followed by postoperative facial exercise. They treated 12 patients who had experienced FN injury for 1-18 months as a result of acoustic tumour

removal. All patients experienced facial grade V-VI paralysis according to the House-Brackmann scale, but their FN was anatomically preserved. No spontaneous facial reinnervation was detected before repair.

Although they did not perform fresh nerve grafts and HN-FN 'side'-to-end neurorrhaphy as controls for ethical reasons, the reparative outcomes after nerve reconstruction were remarkable: functional improvements were detected as soon as 3 months after repair, House-Brackmann grade II or III FN functions were achieved in five and four patients, respectively, and there were no apparent signs of synkinesis. The three patients who experienced less satisfactory outcomes had exhibited facial palsy for more than 1 year accompanied by muscle atrophy, consistent with a need for rapid surgical intervention.

Based on fundamental concepts and this experimental results, this new surgical method represents a major advance in the rehabilitation of FN injury [4].

Facial nerve palsy via hemihypoglossal-to-facial nerve transfers without grafts appears to produce the most satisfactory facial reanimation results, with masseteric-to-facial nerve transfers (MF) providing lesser but still satisfactory outcomes. Using interposed grafts while performing hemihypoglossal-to-facial nerve transfers should likely be avoided, whenever possible [5].

1)
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