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INTRA-OPERATIVE FACIAL NERVE MONITORING DURING PAROTID SURGERY

Parotid surgery is complicated due to the presence of facial nerve and the avoidance of its injury depends on the knowledge and experiences of the surgeon. The knowledge of detailed anatomy of facial nerve and its branching pattern and various landmarks used to identify it are crucial in prevention of facial nerve injury. Usually, the surgery is done by identification of main trunk of facial nerve and tracing its branches. With the advancement in the technology and increased awareness about the complications, different modifications are being done in the surgery. Intra-operative facial nerve monitoring is being used in many centers around the world as an aid to reduce facial nerve injury during surgery. Its use varies, with some centers using them routinely in all the cases while others preferring for difficult and revision cases only.

The reported rate of facial palsy is highly variable in the literatures with temporary weakness in the range of 20-40% and permanent facial weakness in 0-7% of the operated cases. Facial nerve palsy is associated with cosmetic and functional morbidity, may lead to ocular complications and possibility of medical malpractice litigation. Facial paralysis has significant emotional impact on both patients and treating doctor. Factors associated with higher risk of facial nerve injury during surgery include large size of tumor, malignant lesions, location in the deep lobe of parotid and revision surgeries.

There are proponents of facial nerve monitoring during parotid surgery who argue that it is very helpful in preventing post-operative facial nerve palsy. Facial nerve monitoring is the adjunct that a surgeon can use during surgery to assist in preserving functional integrity of the nerve. However; proper and safe surgical technique is paramount in preventing facial nerve injury. Wennmo C argues that in the primary surgery cases, the experience of surgeon and good knowledge of anatomy lead to very low risk of facial nerve injury and nerve monitoring is helpful in cases of revision surgery only. Witt RL claims that in the freely mobile parotid tumor nerve monitoring is not required.

The advantages of using facial nerve monitor during parotid surgery are multifold. Use of nerve monitor is helpful in locating main trunk of facial nerve especially in cases of large or deep lobe tumor and in revision cases. It also helps in identifying branches of facial nerve in cases of retrograde dissection. It would also warn surgeon to avoid unintentional trauma or mechanical stretching of the nerve and its branches. Finally, it is also helpful to check for the functional integrity of the nerve at the end of the surgery.

The routine use of nerve monitoring is being done in many centers around the world with 60% of surgeons in United States using nerve monitor. But, in many other centers it is used in the selected and difficult cases only. The application of facial nerve monitoring in parotid surgery are particularly helpful in revision cases, post radiotherapy, malignant tumors, large or deep lobe tumors, and in minimal invasive procedures like intraparotid lymph node biopsy. There are still many centers especially in the low income countries where there is no availability of facial nerve monitoring during parotid surgery. The reasons for not using it are the extra cost associated with the equipment and also due to lack of familiarity with the use of the monitor. There is also belief that over reliance on equipment might lead to lack of anatomical knowledge and inability or reduced confidence

to carry out surgery when it is not available or not functioning. The use of nerve monitoring is a relatively safe procedure. The use of electrode might sometime cause bleeding or trauma to surrounding structures and infection. There are case reports of facial burn when electrodes were not properly handled. Sometime the false negative response can lead to nerve division and hence the anatomical knowledge is always essential.

The outcomes of use of nerve monitoring compared to surgeries done without use of nerve monitoring are also largely variable in the literature. But, majority of literatures report that there is lower risk of immediate post-operative facial weakness when nerve monitor is used, however; there is no difference in the permanent facial nerve function. In a prospective comparative study conducted by Grosheva et al in 100 parotid surgery for benign lesions, use of nerve monitoring did not diminish either the incidence of immediate postoperative facial paralysis or the final facial outcome. In a retrospective study by Terrell et al comparing the use of nerve monitoring during parotid surgery with control group, there was reduction in the incidence of short term post operative facial weakness while no difference in the final facial nerve function. There was added cost associated with the use of the nerve monitor. In a study by savvas et al, the use of nerve monitoring was associated with low rate of transient post-operative facial nerve dysfunction or the grade of palsy. In a systematic review and meta-analysis done by Sood et al where they looked for the difference in facial nerve injury in the nerve monitoring and control groups. Their study concluded that intraoperative facial nerve monitoring decreases risk of immediate postoperative facial weakness but did not influence the final outcomes of permanent facial nerve weakness. In a recent systematic review and meta-analysis, Chiesa- Estomba et al concluded that there may be decrease in immediate post-operative and permanent facial nerve weakness with use of facial nerve monitoring in primary parotid gland surgery.

To conclude, the use of facial nerve monitoring may not be recommended in routine practice especially in the resource limited centers. The knowledge of facial nerve anatomy and experience of surgeon are crucial in reducing facial nerve injury. But, the surgeons doing parotidectomies should be familiar with the use of nerve monitoring and they should be able to use it in difficult and revision cases.

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