Anomalous Location of Facial Nerve Deep to Parotid Gland

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Abstract: The knowledge of normal and variant anatomy of the facial nerve is essential for safe surgery of the parotid gland. The location of a parotid mass in relation to the course of the facial nerve determines whether superficial or total parotidectomies should be performed. The variant course of the facial nerve within the parotid may endanger the nerve during parotid surgeries. The present report is an attempt to help the surgeons to minimize the error that can damage the nerve without previous knowledge of such type of rare variation.

Key Words: Facial nerve, facial palsy, variation, parotid mass

The course of the facial nerve in relation to the parotid gland is necessary to plan for localizing and protecting the nerve during surgery for parotid tumor. According to standard descriptions, the facial nerve after its exit from the stylomastoid foramen enters the posteromedial surface of the parotid gland, dividing the gland into superficial and deep parts. The most frequent reported morphology of the facial nerve within the parotid gland is its division into cervicofacial and temporofacial divisions. In the presence of a preoperatively intact facial nerve, the surgeon must preserve the patient’s aesthetic and functional integrity, yet pursue the objective of controlling the pathologic condition, whether it be benign or malignant. Borges and Lufkin point out that the location of a parotid mass in relation to the course of the facial nerve determines whether superficial or total parotidectomies should be performed. Several descriptions about the parotid gland and its relation with the facial nerve can be found in the literature. The present case report mentions the existence of facial nerve completely deep to parotid gland.

CLINICAL REPORT

During dissection for medical undergraduates in the Department of Anatomy of Kasturba Medical College, Mangalore, an unusual course of facial nerve was observed. The facial nerve after its exit from the stylomastoid foramen did not enter the parotid gland. The retromandibular vein was superficial to the facial nerve. The nerve was slightly thinner than usual. It passed deep to parotid gland and after a short distance divided into cervicofacial and temporofacial trunks. The temporofacial trunk immediately divided into (1) temporal, (2) zygomatic, (3) and upper buccal branches. The cervicofacial trunk descended further down and divides into (4) lower buccal, (5) marginal mandibular, and (6) cervical branches (Fig. 1).

DISCUSSION

Knowledge of the key landmarks of the facial nerve trunk is essential for safe and effective surgical intervention in the region of the parotid gland. Most surgeons when evaluating the parotid mass settle for defining the course of facial nerve rather than the actual nerve itself. But for masses that lie directly on the course of the facial nerve, this strategy does not work, and the surgery proceeds with caution. The branching pattern of the facial nerve within the parotid gland shows individual variations. Rodrigues et al studied the facial nerve in 15 cadavers and documented the recent variations in its branches in an attempt for adequate preservation in the cases of surgery of benign and malignant diseases of the parotid gland. Heeneman and de Ru et al claim that the amount of normal tissue to be removed in continuity with the tumor is very difficult to manage during the surgery along with functional and anatomic preservation of all branches of the facial nerve whenever possible. The incidence and the pathophysiology of facial palsy in conjunction with parotid abscess or parotitis are unknown. It may range from a partial to total paralysis. Various mechanisms have been proposed to account for the nerve involvement in a nonmalignant lesion. These include direct pressure, inflammation and necrosis, and...
hemorrhage into a cyst or a tumor. In this case and other suppurative diseases, the virulence of the organisms, the extent of perineuritis, and acute nerve compression are likely to be the causes. Nerve damage may be induced by increased pressure over an abbreviated time in addition to the toxic effects of surrounding inflammation.

Standard surgical approach for benign parotid neoplasms is superficial parotidectomy for preneural lesions and total parotidectomy for deep lobe tumors, with careful exposition and dissection of the facial nerve from the main trunk to all peripheral branches. Deep lobe tumors represent 11% of all parotid gland neoplasms. Before these tumors can be excised, the external lobe must be removed to allow identification of the various branches of the facial nerve. The deeper location of the facial nerve, as in the present case, may endanger the branches of the facial nerve during parotidectomy. Previous studies have shown that there is a greater risk of nerve damage during parotidectomy for malignant tumors, especially during total parotidectomy. The surgical technique involves elevating a standard parotidectomy flap with careful dissection of the facial nerve fibers. Although the occurrence of completely deep location of the facial nerve in relation to the parotid gland is very rare, surgeons should consider the possibility of such variations during parotidectomy surgeries.

REFERENCES