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Deep Lobe Parotidectomy

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Abbreviations: SMAS: Superficial Musculoaponeurotic System; ICA: Internal Carotid Artery; ECA: External Carotid Artery.

Introduction

Tumours of the deep lobe are treated by total Parotidectomy [1]. Deep lobe parotidectomy is a critical procedure to master for any head and neck surgeon. Thorough anatomical understanding and safe surgical technique are critical. Parotid gland is invested by the superficial layer of the deep cervical fascia, or parotidomasseteric fascia, which extends into the parotid parenchyma, separating it into lobules [2,3]. This fascia is separate from the superficial musculoaponeurotic system (SMAS). The SMAS lies just superficial to the parotidomasseteric fascia and extends to join the platysma inferiorly and the superficial temporal fascia superiorly [3]. The deep portion of the gland is positioned between the mastoid tip and bony and cartilaginous external auditory canal posteriorly, the ramus of the mandible anteriorly, and the prestyloid region of the parapharyngeal space medially [4]. To enter the parapharyngeal space from the deep lobe of the parotid, the tumor must pass through the stylomandibular tunnel. Stylomandibular tunnel is bounded Infront by the ramus of the mandible, behind by the styloid process and below by stylomandibular ligament. Anteromedially to deep lobe parotid is the internal carotid artery (ICA) and internal jugular vein; and of course, the guide of these great vessels is the styloid process which is lateral to the ICA as it enters the cranium.

Surgical Technique

We should use nasotracheal intubation in all patients with a significant mass in the deep lobe or parapharyngeal extension or large parotid tumor to allow for easy subluxation of the mandible if required. Muscle relaxant should be avoided if facial nerve monitor is going to be used. Facial nerve monitor should be use if available, but the use of it in itself will not protect the nerve. It is the surgeon knowledge of the anatomy and the safe surgical technique which are critical. Typically, deep lobe parotidectomy either as an en bloc or piecemeal is carried out after superficial parotidectomy is done. The following are the steps of deep lobe parotidectomy:

- Following superficial parotidectomy the facial nerve branches must be freed from the underlying deep lobe parotid tissue, as the assistant elevate the nerve using nerve hook or hemostat.
- After freeing the nerve branches from deep parotid tissue, now the parotid tissue can be freed from masseter muscle avoiding undue traction and thermal injury to nerve.
- Next is the third steps, here the surgeon come down to the neck and the deep lobe is dissected off the posterior belly of the digastric, stylohyoid, and stylopharyngeus muscles. The external carotid artery (ECA) can typically be found running between the posterior belly of the digastric and the stylopharyngeus muscles inferior to the mandible which is identified and ligated. The retromandibular vein may not be ligated at this stage and may be leave it flowing in order to relieve venous congestion on the tissue and decrease bleeding during the case.
- After this, the surgeon moves superiorly, now the superficial temporal vessels should be identified and ligated, taking care to preserve the zygomatic and temporal branches of the facial nerve that often run just anterior and cross superficially to superficial temporal vessels. Remember in this region, the auriculotemporal nerve, a branch of the trigeminal nerve (V3), also runs parallel to the superficial temporal vessels lying anterior

to external auditory canal.

- Now the gland should be dissected from superior to inferior or vice versa separating the gland from temporomandibular joint superiorly and from posterior border of the mandible anteromedially. During this dissection, there can be venous bleeding from pterygoid plexus and needs careful hemostasis.
- As you continue to dissect the gland from the posterior border of the mandible, you will encounter the internal maxillary artery and veins passing deep to the mandible which should be isolated and ligated. Now the deep lobe beneath the facial nerve branches is free to be delivered.

Limited deep lobe parotidectomy can occasionally be considered for benign disease by surgeons who have mastered the technique of a more traditional DLP. In this technique, the superficial gland is left attached to the skin flap, the facial nerve is dissected out, and the deep lobe of the parotid is resected, dissecting around only the nerve branches draping over the tumor. This approach may reduce complications such poor aesthetic outcomes, and Frey syndrome. Transoral resection of deep lobe parotid tumors may be considered when the tumor lies predominantly within the parapharyngeal space. This approach can be performed under direct visualization via transoral. But this approach is manoeuvre difficult and the surgeon must maintain a constant vigil of the internal carotid artery.

If mandible subluxation is required, a retractor is placed under the mandible, and an assistant pulls firmly forward in order to open the space between the temporal bone and mandible. This will also open the stylomandibular tunnel, in order to reach to the parapharyngeal space. Mandibulotomy is rarely needed except for oncological clearance in some circumstances or for large tumor for wider access with reduce intraoperative risks to patient [5]. Following total parotidectomy there will be facial contour defect, which can be filled up with free abdominal dermal fat graft as this has minimal morbidity for the patients. The defect contour should be slightly overfilling to anticipate some degree of resorption and should be fixed to the stable surrounding tissue. Facial nerve: If facial nerve is functioning preoperatively and there is no direct involvement of nerve by the tumor, every attempt should be made to preserve the nerve [6]. If facial nerve is preserved one can expect return of good facial nerve function to House-Brackmann grade 1 up to one year following surgery. But if facial nerve is dysfunction preoperatively, whether complete or partial, it is not possible to preserve the facial nerve [7].

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