Chapter 18

Management of the Mass in the Prestyloid Parapharyngeal Space

18

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Contents

Core Features

- To provide a concept of the three-dimensional anatomy of the prestyloid parapharyngeal space (PPS).
- To present the various options for preoperative evaluation of PPS masses.
- To discuss the surgical approaches to the prestyloid PPS and their applications.

Complications to Avoid

- Injury to the facial nerve can be minimized by accurate preoperative planning using CT scanning and by meticulous dissection of the main trunk and its branches.
- Gustatory sweating (Frey's syndrome) can be avoided by preserving the superficial lobe of the parotid gland and returning it to its anatomical position after excision of a deep lobe parotid tumor.

Introduction

The management of the patient with a tumor of the PPS is a challenging task. The PPS is a complex anatomical region due to its three-dimensional shape, deep location, and its intricate surroundings [10]. The PPS is a difficult region to examine, and thus presents a number of technical challenges for diagnosis and surgical management of

these tumors. In fact surgery of the PPS is a relatively recent activity in our field, as the PPS with its components has only been characterized since the introduction of the computed tomography (CT) scan [20].

Anatomy

The PPS has been described as being an inverted triangle with its base at the base of the skull and apex at the hyoid bone (see Fig. 18.1). The lateral wall of the PPS is the pterygoid muscles and the ascending ramus of the mandible [13]. The medial boundary is the pharyngobasilar fascia and the superior constrictor muscle [8]. The posterior limit of the PPS consists of the cervical spine and the adjacent deep muscles of the neck. The anterior boundary is formed by the medial pterygoid muscle [7, 10]. The apex of the PPS is the submandibular triangle to the level of the hyoid bone. Two sides of the PPS are bone, i.e., the skull base superiorly and the mandible laterally. As a result, the tumors of the prestyloid PPS spread along the path of least resistance, which is the anterior, medial, and inferior direction. These tumors displace the pharyngeal wall and the tonsil and often present as a submucosal mass in the pharynx.

The prestyloid PPS is a potential space within the PPS. The fascia of the tensor veli palatini extends from the styloid process to the skull base dividing the PPS into the prestyloid and poststyloid compartments [13] (Fig. 18.2). The prestyloid PPS contains the pterygoid muscles, the retromandibular portion of the deep lobe of the parotid gland, the internal maxillary artery, the lingual nerve, and the inferior dental nerves. It also contains adipose tissue, minor nerves, vessels, and lymphatics [7]. Though the fascia itself cannot be visualized on imaging, CT and/or magnetic resonance imaging (MRI) can accurately classify tumors of the PPS as being in the prestyloid or poststyloid compartment [8]. This information is vital in identifying the tissue of origin of the tumors within the PPS and in developing a differential diagnosis and plan for further management.

Tumors may develop from the various types of tissue present within this anatomical space. The origin of tumors in the PPS, whether prestyloid or poststyloid, is important in their differential diagnosis and management. The clinical correlation of imaging studies and surgical findings has provided information which allows the clinician to predict the tumor type from the imaging studies with a high degree of accuracy. The key anatomical landmarks for this differentiation are the prestyloid fat, the medial pterygoid muscle, the carotid artery, the posterior edge of the mandible, and the styloid process. Of these the carotid artery and the styloid process are the most important landmarks for the clinician.

Tumors of the prestyloid PPS are usually of salivary gland origin, usually arising from the deep lobe of the parotid gland. Most of these tumors are pleomorphic adenomas which arise from the deep lobe of the parotid gland (see Fig. 18.3a, b) but can also arise less frequently, de novo in the prestyloid PPS. An enhanced CT scan or MRI will clearly demonstrate extension of deep lobe tumors of the parotid gland through the stylomandibular tunnel, extending medially and displacing the parapharyngeal structures (see Fig. 18.4a, b). The demonstration of a fat plane between the deep lobe of the parotid gland and the tumor is indicative of tumor originating de novo in the PPS, most commonly from the extraparotid minor salivary glands. The lack of visualization of this plane indicates a tumor originating in the deep parotid lobe or invading it [9]. High resolution images of the MRI are superior to the CT scan to make such a differentiation [10].

A wide variety of benign and malignant tumors can occur in the PPS (see Table 18.1). About 80% of PPS masses are benign, while 20% are malignant [5]. The primary radiological differential diagnosis for a tumor originating in the prestyloid PPS is a deep lobe parotid tumor and or a neurilemoma (arising from the lingual nerve, inferior alveolar nerve, or auriculotemporal nerve). Although a mass in the prestyloid PPS is more likely to be of salivary gland origin, it is extremely difficult to differentiate it radiologically from a neurilemoma and hence the possibility of a neurilemoma must be taken into consideration in the differential diagnosis. Cancers arising in other sites such as thyroid [6], nasopharynx [24], and maxilla [22], with metastasis to the prestyloid PPS have been described. Raut et al. reported a case of metastatic carcinoma of the breast which presented as a deep lobe parotid tumor in the PPS 15 years after the primary presentation [17].

Clinical Presentation

Tumors of the PPS may be present for several years prior to clinical presentation. They often have to grow to at least 2.5–3.0 cm before they are detected [20]. Carrau et al. found that 20% of masses were also found incidentally [3]. Such incidental findings are not surprising with the routine use of imaging for diagnostic purposes today. The

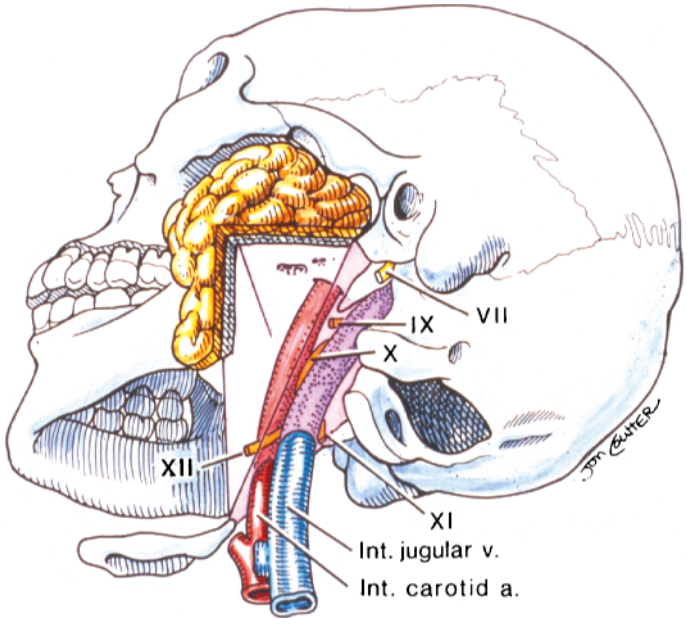


Fig. 18.1: Parapharyngeal space: an inverted triangle with base at skull base and apex at the hyoid bone. [Reprinted with permission from: Carrau RL, Myers EN, and Johnson JT (1990) Management of tumors arising in the parapharyngeal space. Laryngoscope 100:583–9]

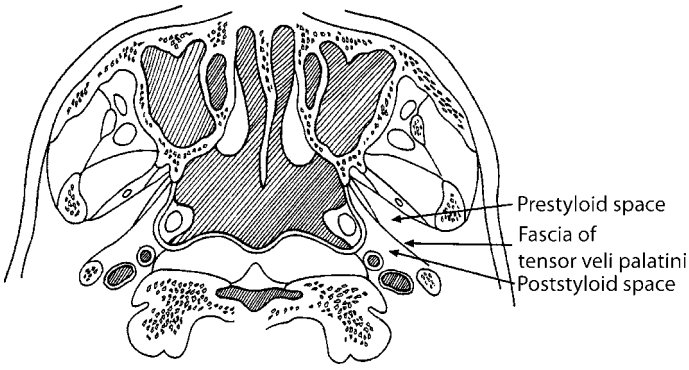


Fig. 18.2: Parapharyngeal space: anatomical boundaries. [Reprinted with permission from: Johnson JT (1997) Parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

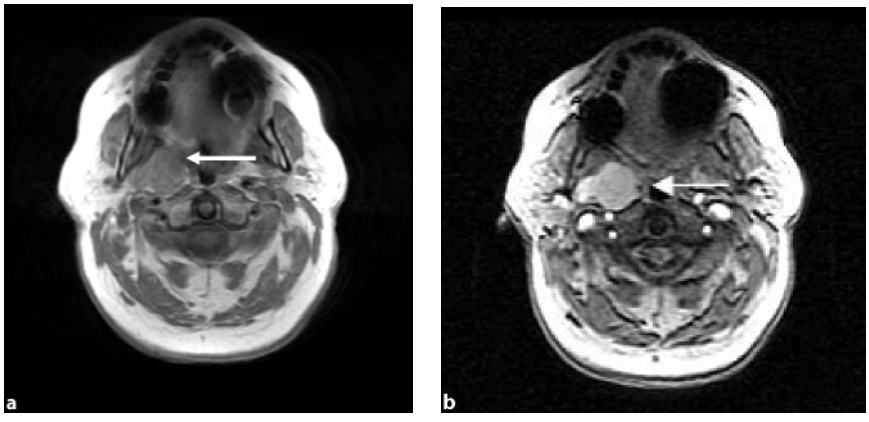
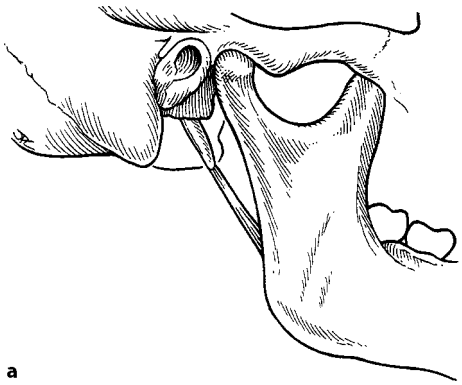


Fig. 18.3: **a** T1-weighted MRI image of a pleomorphic adenoma involving the prestyloid PPS. **b** T2-weighted MRI image of a pleomorphic adenoma originating the prestyloid PPS



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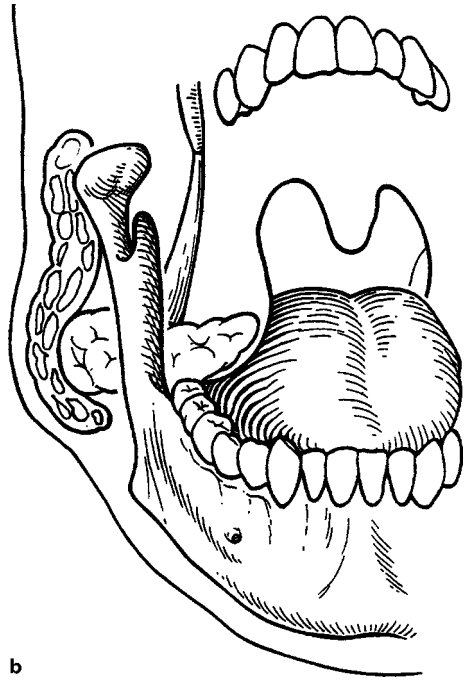

b

Fig. 18.4: **a** Styloid process and its relationship to the mandible forming the stylomandibular tunnel with the stylomandibular ligament as the inferior boundary. [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia] **b** Deep lobe tumors of the parotid gland passing through the stylomandibular tunnel, often presenting as an oropharyngeal mass [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

most commonly encountered presentation of a neoplasm involving the prestyloid PPS is an asymptomatic submucosal mass in the lateral wall of the oropharynx with or without a mass in the parotid gland or the neck (see Table 18.2) (Fig. 18.5). Expansion of these tumors may interfere with the proper fit of an upper denture and on occasion may become symptomatic based on the large size, producing interference with breathing and swallowing. In a retrospective study of 166 PPS tumors, about 25% of patients did not report any symptoms at the time of diagnosis [5]. The presence of a mass in the parotid gland is often associated with the mass in the oral cavity. The presence of pain or neuropathy should direct the clinician to suspect a primary or metastatic cancer. In addition to the clinical signs and symptoms, a detailed examination of the head and neck, which would include an examination of the cranial nerves, and bimanual palpation allows the clinician to formulate a clinical impression of the extent of the tumor.

Preoperative Evaluation

Patients being evaluated for a tumor in the prestyloid PPS should undergo a thorough history and physical examination. Tumors of the head and neck, and poststyloid PPS masses such as paragangliomas should be ruled out. Certain aspects of the physical examination, such as indirect laryngoscopy or fiberoptic laryngoscopy, should be performed to evaluate the motion of the vocal cords.

Imaging

The distinction between tumors of the prestyloid and poststyloid space may be made radiologically based on a clear understanding of anatomy in this region. Som et al. [20], developed a CT protocol to provide a preoperative diagnosis accurately in 88% of PPS tumors. There were ten large tumors in their study of 104 cases which could not be diagnosed initially but the CT scan helped to limit the differential diagnosis in the ten cases. In our department, CT scan with contrast has been used almost exclusively with the exception of certain patients in whom there is a suspicion of intracranial extension who benefit from MRI studies. The prestyloid PPS has a significant fat content which is easily displaced and deformed, and it has high signal intensity on T1-weighted images (see Fig. 18.6) [10]. The posterior displacement of the carotid artery and internal jugular vein on MRI is suggestive of a

Table 18.1. Tumors of the PPS removed at the Department of Otolaryngology, University of Pittsburgh

Histology	Number of tumors
Paraganglioma	69
Pleomorphic adenoma	32
Squamous cell carcinoma	10
Neurilemoma	7
Salivary duct carcinoma	3
Sarcoma	3
Schwannoma	3
Adenocarcinoma	2
Adenoid cystic carcinoma	2
Carcinoma ex pleomorphic adenoma	2
Lipoma	2
Lymphangioma	2
Lymphoma	2
Meningioma	2
Hemangioma	1
Hemangiopericytoma	1
Leiomyosarcoma	1
Liposarcoma	1
Lymphoepithelial carcinoma	1
Mucoepidermoid carcinoma	1
Myoepithelioma	1
Neurofibroma	1
Oncocytic papillary cystadenoma	1
Thyroid carcinoma	1
Warthin's tumor	1

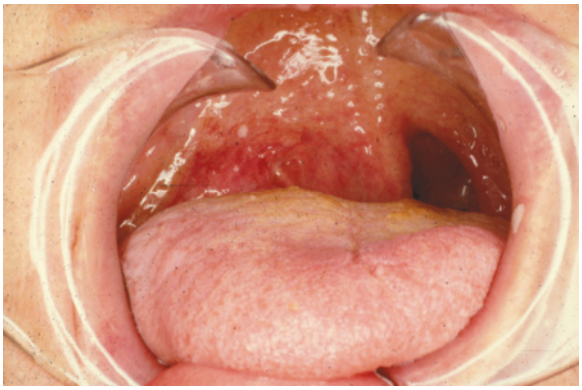

Fig. 18.5: Prestyloid PPS tumor presenting as an intraoral mass. [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

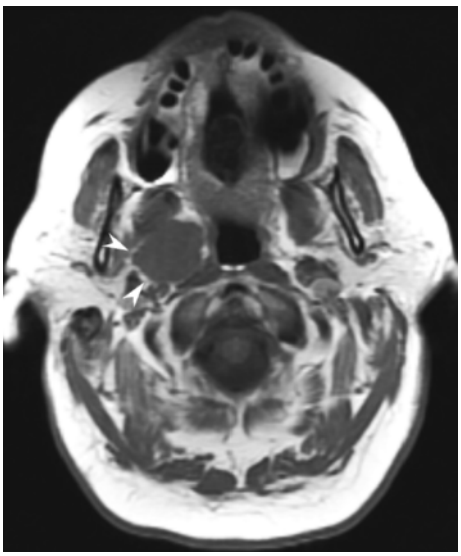

Fig. 18.6: Axial unenhanced T1-weighted image through the PPS demonstrates a 3-cm parapharyngeal mass separated from the deep lobe of the parotid by an intact fat plane (*arrowheads*). This mass, which displaces the fat plane medially, was excised and shown to be a pleomorphic adenoma

Table 18.2. Clinical presentation of prestyloid PPS tumors

Symptoms		Signs
Asymptomatic	→	Normal examination (incidentaloma)
Lump in the neck	→	Mass in the neck/parotid region
Difficulty swallowing or breathing	→	Intraoral mass
Asymmetry of the face	→	Facial paresis or palsy
Hearing loss or otalgia	→	Serous otitis media
Others		
Pain		Trismus
Globus sensation		

prestyloid PPS tumor. Dynamic MRI and magnetic resonance angiography (MRA) are additional tools that can provide supportive evidence for vascular tumors originating in the region.

The distinction between prestyloid and poststyloid space tumors is the most important aspect of radiological evaluation. Clinical correlation along with imaging can help to clearly define what type of tumor the patient has and provides us with a very clear plan of management based on location and histology. In most cases, this clinicoradiological correlation can serve as a substitute for a biopsy.

Recently other types of imaging studies have emerged. In a recent study, a three-dimensional (3D) digital reconstruction of the prestyloid PPS was performed with the help of two-dimensional MRI data and thin cadaveric sections of the PPS. The digitalized 3D model could clearly demonstrate the spatial relationship of various structures in the PPS. In the prestyloid PPS, besides the pharyngeal vein, the ascending pharyngeal artery with its branches and the submandibular nerve could be clearly demonstrated. Such 3D reconstructed images of the MRI would provide important data for radiological diagnosis, surgical planning, and radiotherapy. Positron emission tomography (PET) and PET with CT may also help to diagnose and monitor tumors of the PPS. The PET scan has been shown to have the ability to reflect tumor growth in pleomorphic adenomas, which are the most common tumors found in the prestyloid PPS [12]. In the same way as F-DOPA-PET with CT does seem to improve the diagnostic accuracy of paragangliomas in the PPS [1, 2], an image fusion of the PET and CT may help to improve diagnostic accuracy and anatomical definition of the prestyloid PPS lesions.

Tumors of the deep lobe of the parotid gland can be differentiated from those arising de novo in the prestyloid PPS by the presence of a fat plane between the deep lobe of the parotid gland and the tumor. This is a very important point in planning the surgical approach for these tumors, since the tumors independent of the parotid gland may be removed through a cervical approach whereas tumors arising in the deep lobe of the parotid gland with extension into the PPS must be approached through a parotid-submandibular approach with dissection of the facial nerve off the deep lobe in order to avoid injury to the facial nerve.

Fine-needle Aspiration Biopsy (FNAB)

Fine-needle aspiration biopsy may contribute to preoperative histopathological evaluation of prestyloid PPS tumors. Palpable tumors can be easily aspirated; however more deeply seated tumors may need accurate fine-needle aspiration with ultrasound or CT guidance [13]. The current literature on histopathology of prestyloid PPS tumors is based on the study of surgical specimens, with much less emphasis on FNAB or incisional biopsies. This may have been due to the fact that regardless of preoperative histological findings, most tumors will require excision. Secondly, there is a theoretical possibility of hemorrhage, infection, and tumor seeding with FNAB creating a bias against performing FNAB for diagnostic purposes. More recent reports have shown these beliefs to be unfounded [14]. Wilson et al. reported no instances of tumor seeding after diagnostic aspiration [23]. With respect to hemorrhage, the aspiration of a carotid body tumor, which is

not a tumor found in the prestyloid PPS, seems to be the only contraindication to FNAB. A recent review of PPS tumors has shown that FNAB for PPS tumors has an accuracy, sensitivity, and specificity of 94%, 86%, and 100%, respectively [14].

Fine-needle aspiration biopsy may be especially helpful in patients suspected of harboring malignant tumors. Clinical findings such as pain, nerve involvement, rapid growth, and fixation, with radiological evidence of bone involvement are suggestive of a malignant tumor. In these cases, an FNAB may be helpful to confirm the clinical suspicion and provide valuable information for treatment planning and counseling the patient and family preoperatively. It does seem reasonable to assume that FNAB of prestyloid PPS tumors can be done safely under image guidance, if necessary, to help in treatment planning. However, traditionally we have not advocated FNAB prior to surgical resection since in most cases it does alter the plan of management.

Surgical Approaches to Tumors of the Prestyloid Parapharyngeal Space

There are a variety of surgical approaches which may be used for the management of tumors of the PPS (see Table 18.3). The traditional approaches to the prestyloid PPS are the transcervical or transcervical-transparotid approaches, either of which may be augmented with a mandibulotomy [5, 21]. Other than PPS extensions of deep lobe parotid tumors, most PPS masses can be excised by the transcervical technique alone.

Transoral/Transoral-Transcervical Approach

Transoral excision has been advocated for neoplasms arising in the prestyloid PPS especially when the tumors are limited to the prestyloid PPS and cannot be felt in the neck or parotid gland. A pure transoral approach provides several advantages. It is the most direct approach to the tumors of the prestyloid PPS, which may bulge into the oropharynx or lateral pharyngeal wall. Exposure of the tumor requires less surgery, and careful dissection will prevent damage to important adjacent structures, including the facial nerve [7]. Disadvantages of this approach include incomplete exposure and lack of proximal control of the internal carotid artery. Transoral excision alone has also been criticized for an associated increased risk of bleeding, tumor spillage, and increased rate of recurrence [5]. In our opinion, lack of adequate exposure deprives the surgeon of the opportunity to identify the closely related neurovascular structures or Stensen's duct, which can increase the risk of injury to these structures. Transoral excision may also compromise the wound through contamination by oral secretions or seed the tumor into the mucosa of the palate.

For these reasons we do not advocate transoral/ transmucosal biopsies or partial removal. In addition to contaminating the mucosa, scarring increases the difficulty of subsequent removal. In cases where prior biopsy has been done, a combined transoral-transcervical approach would ensure complete and safe resection. In case of a recurrence, the scar from the previous transoral surgery should be removed at the time of the transcervical revision surgery.

Table 18.3. Surgical approaches used in surgery of the prestyloid PPS

Surgical approaches
• Transoral
• Transoral-transcervical
• Transcervical
• Transcervical-transparotid
• Mandibulotomy

Transcervical/Submandibular Approach

The prestyloid PPS is ideally approached using the transcervical submandibular technique (see Fig. 18.7). The skin incision is made in the major transverse skin crease in the neck. A facelift incision may also be used. This is carried down through the subcutaneous tissue and platysma muscle. The mandibular branch of the facial nerve must be identified and preserved. Identification of the anterior border of the sternocleidomastoid muscle facilitates identification of the posterior belly of the digastric muscle. The submandibular gland is then dissected free of the surrounding tissues. The facial artery is identified deep to the posterior belly of the digastric muscle and is clamped, transected, and doubly ligated with silk suture. The submandibular gland is then mobilized anteriorly where it is pedicled on the submaxillary ganglion and Warthin's duct

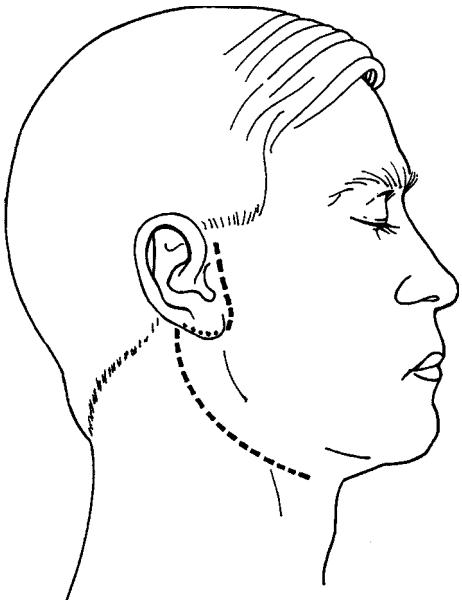

Fig. 18.7: Transcervical approach. [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

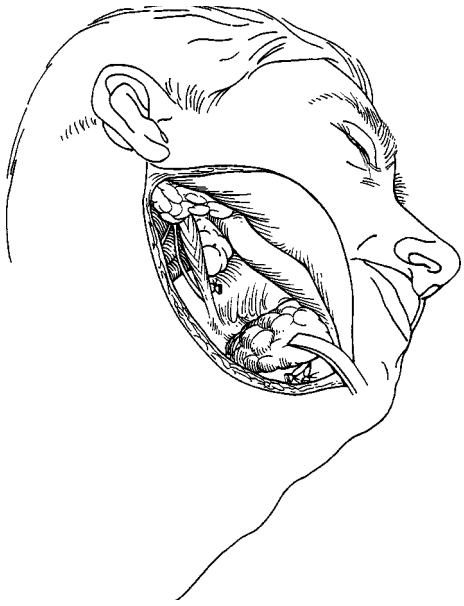

Fig. 18.8: Mobilization and anterior retraction of the submandibular gland to gain access to the parapharyngeal space. [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

(see Fig. 18.8). It is not necessary to remove the submandibular gland as has been reported by Malone et al. [11], but it is important to retract it anteriorly since this exposure provides direct access to the apex of the prestyloid PPS. Once the gland has been mobilized the tumor is identified and using sharp and blunt dissection the tumor is separated from surrounding tissues (see Fig. 18.9). There are some specific maneuvers that can increase exposure at this stage of dissection. A stylomandibular release and anterior dislocation of the mandible can increase exposure by 50%. Subsequently, the styloid process, styloid musculature, and posterior belly of the digastric muscle can be removed for additional exposure [5, 16].

Tumors in the prestyloid PPS are usually pleomorphic adenoma which does not invade the surrounding soft tissue. However, to prevent recurrence every effort should be made to preserve the capsule of the tumor. A suction drain is placed in the depths of the wound and brought out just posterior to the skin incision in order to collapse the dead space. The wound is then meticulously closed and a dressing applied.

Transcervical-Transparotid Approach

The majority of tumors of the prestyloid PPS require formal identification and preservation of the main trunk of the facial nerve. We advocate the parotid-submandibular approach for prestyloid PPS tumors which arise from the deep lobe of the parotid gland. Other authors have also recommended the transcervical-transparotid approach for all deep lobe parotid tumors [15, 19]. The potential injury to the facial nerve from tumors that either arise from the deep lobe of the parotid or are adherent to it are the most important reasons for this approach which allows adequate exposure and early identification of the facial nerve.

An extended parotid-submandibular incision includes a modified Blair incision in the preauricular skin crease, carried around the earlobe and then extended into the neck in a prominent horizontal skin crease to the level of the submandibular gland (Fig. 18.10). The submandibular gland is then mobilized by ligating the facial artery and displacing the gland anteriorly. The skin

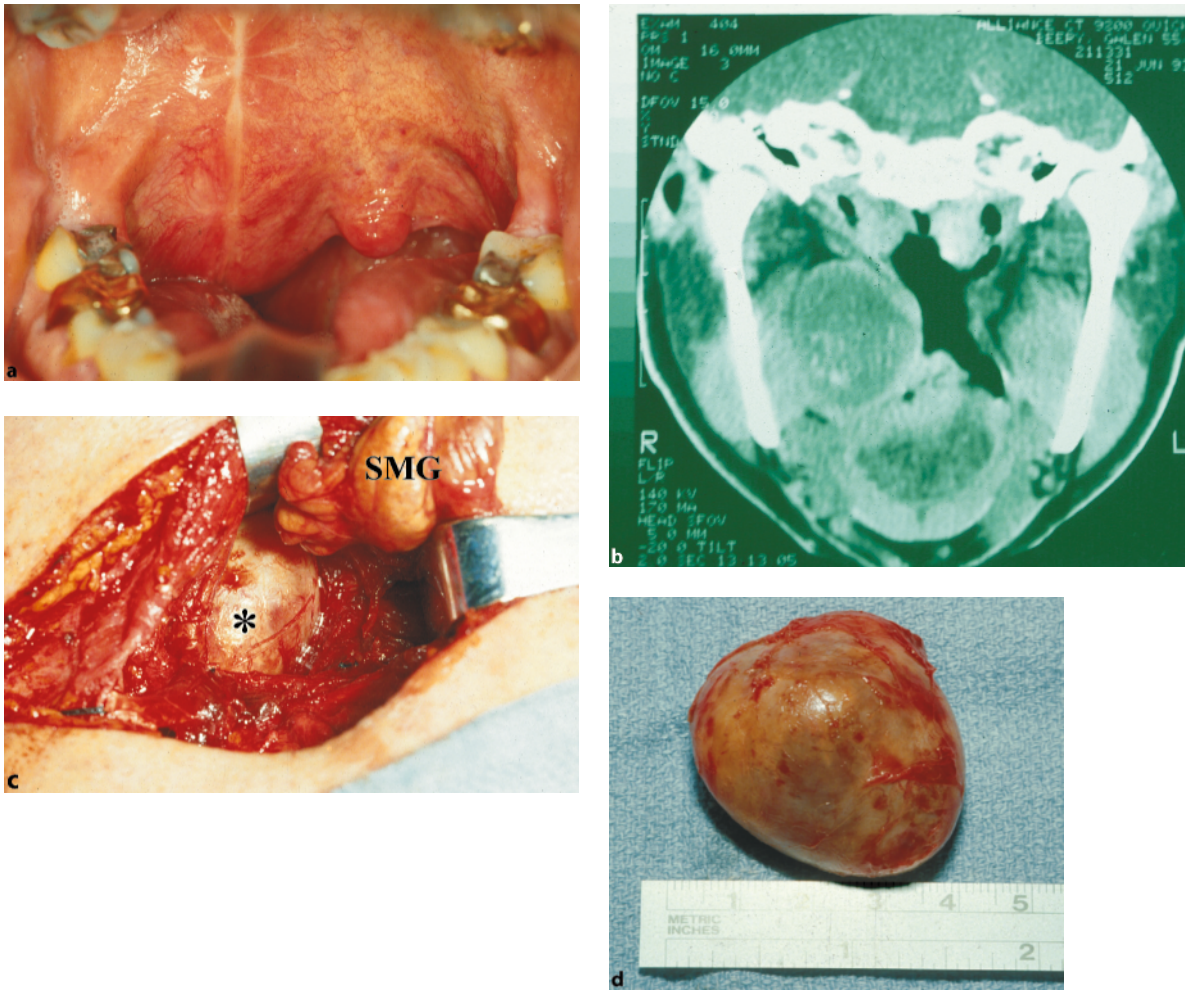

Fig. 18.9: **a** A prestyloid PPS tumor presenting as an intraoral submucosal mass. [Reprinted with permission from: Myers EN, Johnson JT, Curtin HD (2003) Tumors of the parapharyngeal space. In: Myers EN, Suen JY, Myers JN, Hanna EH (eds) Cancer of the Head and Neck, 4th edn. Saunders, Philadelphia] **b** A coronal CT scan showing the mass occupying the prestyloid PPS displacing the lateral oropharyngeal wall medially. [Reprinted with permission from: Myers EN, Johnson JT, Curtin HD (2003) Tumors of the parapharyngeal space. In: Myers EN, Suen JY, Myers JN, Hanna EH (eds) Cancer of the Head and Neck, 4th edn. Saunders, Philadelphia] **c** The mass (*asterisk*) is exposed through a transcervical incision displacing the submandibular gland anteriorly (*SMG*). **d** Specimen of the prestyloid PPS tumor showing the smooth surface of the mass which facilitates mobilization by blunt dissection

flaps are raised as in a parotidectomy, and the main trunk of the facial nerve is identified by using the landmarks of the anterior border of the sternocleidomastoid, the mastoid tip, and the cartilaginous external auditory meatus. The main trunk of the facial nerve is identified and the divisions of the facial nerve are exposed (Fig. 18.11). In doing this, the superficial lobe is dissected from the facial nerve, pedicled anteriorly and preserved. Tumors of the deep lobe of the parotid gland which involve the prestyloid PPS will most often lie just beneath the branches of the facial nerve. The branches of the facial nerve are dissected free of the capsule of the tumor and the nerve

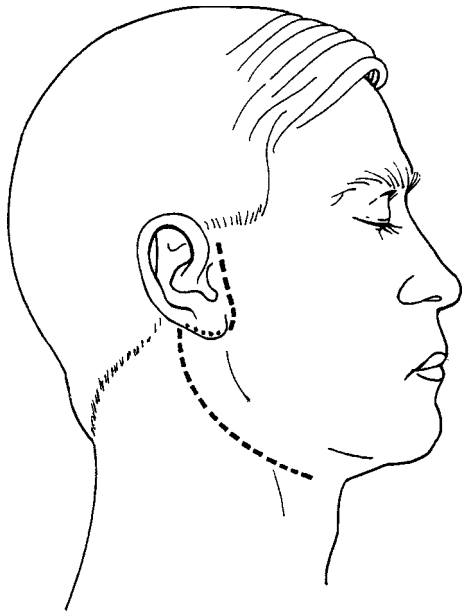

Fig. 18.10: Incision for the transcervical-transparotid approach. [Reprinted with permission from: Johnson JT (1997) Prestyloid parapharyngeal space. In: Myers EN (ed) Operative Otolaryngology: Head and Neck Surgery. Saunders, Philadelphia]

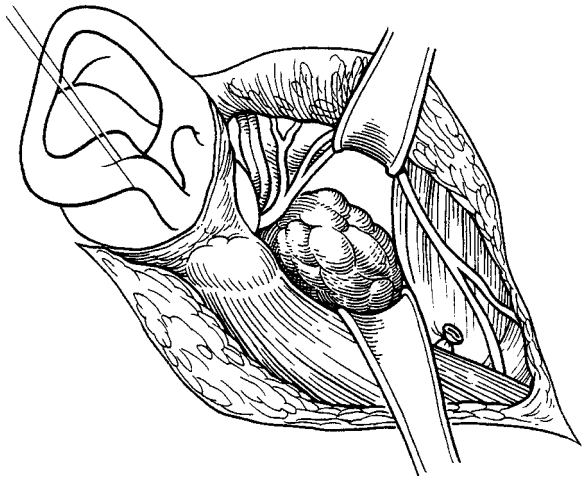

Fig. 18.11: Identification and dissection of the facial nerve displaying the pes anserinus. [Reprinted with permission from: Myers EN, Johnson JT, Curtin HD (2003) Tumors of the parapharyngeal space. In: Myers EN, Suen JY, Myers JN, Hanna EH (eds) Cancer of the Head and Neck, 4th edn. Saunders, Philadelphia]

is mobilized. The deep lobe tumor is then delivered through this exposure in a three-dimensional manner with a combination of blunt and sharp dissection. Blunt finger dissection is often sufficient for extraparotid salivary gland tumors of the prestyloid PPS. The maneuvers used to increase exposure for the transcervical approach such as a stylomandibular tenotomy and anterior retraction of the mandible can also be employed to increase exposure if needed. At the end of the procedure, after hemostasis is obtained and the wound irrigated, the superficial lobe of the parotid gland is replaced in its anatomical position in order to ensure that the contour of the face is preserved. The wound is then closed in layers over a suction drain.

Mandibulotomy Approach

The mandibulotomy approach is usually reserved for tumors of the poststyloid PPS. Such a midline or anterior mandibulotomy may be helpful to increase exposure for lesions in the superior PPS, tumors larger than 8 cm, tumors encasing the internal carotid artery, and malignant tumors invading the skull base or vertebral bodies. This approach has limited utility for the management of prestyloid PPS tumors. In our opinion, most prestyloid PPS tumors can be managed satisfactorily with a transcervical approach and its modifications with the exception of deep lobe parotid tumors, which can be safely approached via a transcervical-transparotid approach. An interesting new approach described by Teng et al. [21] described a subcutaneous mandibulotomy which the authors feel affords excellent access to the PPS without the lip-split, chin-split, and floor of mouth incisions which are a part of the usual midline mandibulotomy. They propose the approach for tumors which are inaccessible through the transcervical approach yet do not require a full midline mandibulotomy for a safe and complete removal.

Complications

Complications of the surgery could be either sequelae expected from the operation (e.g., if a cranial nerve is

Table 18.4. Complications of PPS surgery

Complication	Causative factor
Facial nerve weakness	Traction injury to the facial nerve
First bite syndrome	Parotid "sympathectomy"
Trismus/temporomandibular joint pain	Dislocation of the temporomandibular joint during mandibular swing
Tongue weakness	Hypoglossal nerve injury
Hematoma	Inadequate hemostasis, slippage of ligature especially from the facial artery
Seroma	

resected for oncological reasons) or unexpected complications such as facial nerve damage and the first bite syndrome which are the most frequent complications of surgery for prestyloid PPS tumors [5] (Table 18.4).

Damage to the Facial Nerve

The most common complication of dissection of the prestyloid PPS relates to the facial nerve. If the tumor is separated from the deep lobe of the parotid by a distinct fat plane, removal of tumor completely without injury to the nerve can be expected. If, however, the tumor is a PPS extension of a deep lobe parotid tumor, then it is possible that injury to the facial nerve, either from inaccurate dissection or traction on the nerve, may occur. Traction injuries to the facial nerve can be expected to recover within 3 months [5].

Proper eye care is essential for patients with facial nerve injury. In the immediate postoperative period a moisture chamber is used. Patients who are expected to have a prolonged recovery from facial paralysis benefit from insertion of a gold weight into the upper eyelid. In cases where excision of the facial nerve is necessary, options for rehabilitation of facial function include an immediate reconstruction with an interposition nerve graft (greater auricular nerve) or a temporalis muscle sling to reanimate the oral commissure [9] (refer to Chapter 24, Facial Nerve Reconstruction, and Chapter 26, Reconstruction after Excision of Cancer of the Salivary Glands, for further details on facial nerve rehabilitation and reconstruction).

First Bite Syndrome

The "first bite syndrome" may occur in patients with dissection of prestyloid PPS tumors. It is characterized by a pain in the parotid region immediately after the first bite of each meal, which lasts for a few seconds, improves with each bite, and is at its worst with the first meal of the day. Symptoms are usually mild but can be severe enough to hinder a patient's quality of life and ability to eat. This syndrome is commonly seen when parotid tissue is left behind after deep lobe parotid surgery via the transcervical-transparotid approach, accompanied by an interruption of sympathetic supply to the parotid either due to a injury to the cervical sympathetic chain or due to a selective sympathetic denervation accompanying an external carotid artery ligation. This concept of a parotid "sympathectomy" has been proposed by Chiu et al. [4]. In the authors' experience, current treatment options have not been effective. Medical treatment is symptomatic with nonsteroidal anti-inflammatory medications or carbamazepine. If medical treatment fails, tympanic neurectomy may provide relief in some patients [4].

Conclusion

The management of prestyloid PPS masses is surgical. A detailed preoperative evaluation will help define the location, type, and the extent of the tumor. In most cases a complete resection of the tumor is possible via the transcervical approach. For tumor originating in the deep parotid lobe, facial nerve identification and dissection should be performed to prevent inadvertent injury to the facial nerve.

Take Home Messages

- Tumors in the prestyloid PPS are usually of salivary gland origin.
- Modern imaging techniques permit the surgeon to formulate a plan of management without a preoperative biopsy.
- Image-guided fine-needle aspiration can be considered for tumor limited to the prestyloid PPS, particularly if malignancy is suspected.
- A transcervical approach with its modifications will provide adequate exposure for a complete resection in most cases if the mass is not a PPS extension of a tumor of the deep lobe of the parotid gland.
- Excision of a tumor in the deep lobe of the parotid gland with extension to the PPS requires that the branches of the facial nerve be identified and mobilized off the tumor.
- Transoral incisional biopsy of a tumor of the PPS may result in contamination of the mucosa and make eventual transcervical resection more difficult.

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