

### INTRODUCTION

Although tumours of the salivary glands are not frequently encountered in general practice, it is important that they are correctly managed. This chapter presents an overview of the assessment and management of such tumours, and includes South African data.

Salivary glands comprise the major paired salivary glands (parotid, submandibular, sublingual) and minor salivary glands in the mucosal lining of the upper aero digestive tract. Other than radiation therapy many years previously, the aetiology of salivary neoplasms is unclear. As a rule of thumb, the smaller the salivary gland from which the neoplasm has originated the greater the chance of it being malignant: the majority of parotid neoplasms are benign; about 40% of submandibular, 50% of sublingual and 60% of minor salivary gland neoplasms are malignant.

### PATHOLOGY OF NEOPLASMS

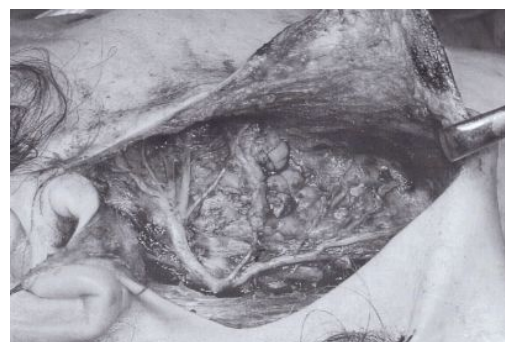
The histopathological classification of parotid neoplasms is complex. The most commonly encountered tumours are outlined in Table I.

<b>Adenomas</b>
• Pleomorphic adenoma
• Adenolymphoma
• Other adenomas
<b>Carcinomas</b>
• Acinic cell
• Mucuepidermoid
• Adenoid cystic
• Polymorphous low grade
• Ex pleomorphic
• Undifferentiated
• Squamous
• Adenocarcinoma
<b>Non-epithelial (eg. Vascular, lymphatic, neural origin)</b>
<b>Malignant Lymphomas</b>
<b>Secondary (metastases)</b>
<b>Unclassified tumours</b>
<b>Tumour like lesions</b>

*Table I: Most commonly encountered salivary tumours*

### RELEVANT ANATOMY OF THE PAROTID GLAND

As the term “parotid ” implies, the parotid glands are situated anteriorly and inferiorly to the external ear. Saliva drains via the parotid duct that pierces the buccal mucosa in the region of the 2<sup>nd</sup> upper molar tooth. The facial nerve and its multiple branches pass through the parotid gland. Approximately 70% of the gland’s volume is superficial to the facial nerve and its branches. Parotid tumours occur most commonly in the superficial lobe. The parotid gland also contains several lymph nodes that may become enlarged by cancer metastases, lymphoma or infection, including tuberculosis. The deep lobe extends into the retromandibular sulcus, and is related on its deep aspect to the styloid process and deep to this, the internal carotid artery.



*Figure 1: The superficial parotid lobe has been removed to expose the facial nerve and its branches. The deep lobe is visible beneath the facial nerve.*

### DIFFERENTIAL DIAGNOSIS

Parotid tumours may either be primary salivary gland tumours, or tumours may arise in lymphatic tissue (lymphoma), or be metastases. Rarely, tumours may originate from other local tissues e. g. blood vessels, nerves (neurofibromas, schwannomas), fat (lipomas) etc. Lymphoma is increasingly encountered due to its

association with HIV. It is therefore important to take a thorough history and do a complete head and neck examination when confronted with a patient with a parotid mass.

Figure 2 summarizes the incidence of different parotid neoplasms in Cape Town.

Although 69% were benign. 45% of parotid neoplasms in males were malignant. The majority of benign tumours were pleomorphic adenomas. Parotid tumours are more likely to be malignant in children than in adults. Therefore one cannot simply reassure a patient with a parotid mass that it can be observed, without excluding a malignant tumour.

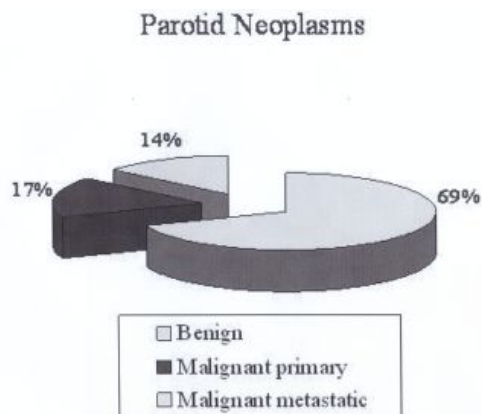


Figure 2: Most common causes of parotid tumours in South Africans

Cases	196	
Malignant	31%	
Top 3 cancers	Squamous cell carcinoma of skin	23%
	Mucoepidermoid carcinoma	17%
	Malignant melanoma of skin	15%

Table 1: Top 3 parotid malignancies in South Africans

Metastases to parotid nodes occur most commonly from skin cancers e.g. squamous cell carcinoma and melanoma of the facial, temporal and auricular skin. Metastases from skin malignancies may be cystic. One

should therefore question sp patient with a parotid mass specifically about previous skin lesions that might have been excised or frozen in the past, and examine the scalp in detail. Rarely metastases may occur from cancers of the eye, and even distant sites such as breast cancer.

### CLINICAL APPROACH TO PATIENT PRESENTING WITH PAROTID TUMOUR

The principal goals of history and clinical examination are to determine whether the tumour is:

- Neoplastic
- Benign or malignant
- If malignant
  - Primary (salivary) or metastatic or lymphoma
  - Localised or metastasized to the neck nodes or distantly

Clinical pointers of malignancy include:

- Previous skin cancers of the head and neck
- Irradiation to the parotid region many years previously
- Rapid growth
- Pain
- Local invasion
  - Trismus: invasion of muscles of mastication or temporomandibular joint
  - Skin infiltration
  - Fixity of the mass to deeper tissues
  - Facial nerve weakness or paralysis
  - Metastases to cervical lymph nodes or lungs

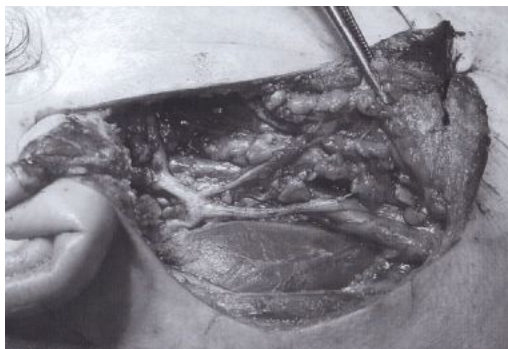
### Is imaging always required?

Imaging of parotid tumours such as ultrasound. sialography. CT scans, MRI scans and PET scans is not always required. Imaging generally cannot distinguish between benign and malignant tumours. Therefore the decision whether to request imaging and what imaging to get should be left to the surgeon treating the mass. The

surgeon may request CT scanning or rarely, MRI, to better determine the relationship of the tumour mass to the facial nerve and to exclude deep extension to the parapharyngeal space.

Even though the facial nerve itself cannot be seen on CT or MRI scan, it lies adjacent to the retromandibular vein which is visible on contrasted CT and MRI (Figure 3).

CXR is required for patients with malignant tumours to rule out metastases.



*Fig 3: Position of facial nerve relative to tumour can be predicted by identifying the retromandibular vein on CT / MRI, as the nerve always is closely applied to the vein*

### **Fine needle aspirafion cytology (FNAC)**

FNAC also is not always required. It is not 100% accurate, even in the very best hands. In a clinically benign tumour that is mobile and readily resectable, one would proceed straight to parotidectomy. It may however be useful in the following circumstances:

- Exclude inflammatory disease eg TB, sarcoidosis
- Exclude lymphoma
- Exclude metastasis from skin cancers, as such patients might require neck dissection in addition to parotidectomy
- Patients who do not wish to, or are unfit to have surgery
- Inoperable tumours

### **Trucut and open biopsy**

Trucut and open biopsy are generally not done in parotid tumours, as it may lead to seeding (tumour deposits) along the biopsy tract. It is therefore reserved for inoperable cases before committing a patient to radiation therapy, or when FNAC is suggestive of lymphoma.

### **PAROTIDECTOMY**

All surgically resectable parotid tumours, other than lymphoma, are removed by partial or total parotidectomy with preservation of the facial nerve under general anaesthesia. This is done both to remove the tumour, and to obtain definite histological diagnosis.

### **Consequences of surgery**

- **Scar**  
The incision extends in a skin crease in front of the ear, and into a horizontal skin crease in the upper neck. It usually heals with very little visible scarring
- **Greater auricular nerve**  
Patients have permanent loss of skin sensation of the lower half of the external ear, and over the parotid area. Some years later they may develop a neuroma in the upper neck, just below the ear, where the nerve has been transected which is tender to touch
- **Facial nerve**  
The nerve is very sensitive to surgical manipulation, and it is not unusual to have temporary weakness of the face, that recovers within a few weeks or months. Permanent weakness is very uncommon following parotidectomy for benign tumours. However the nerve or nerve branches may have to be resected

and grafted if invaded by malignant tumours

- **Frey's syndrome (gustatory sweating)**

Many patients will note sweating over the parotidectomy area when eating/drinking, some years after surgery. It is due to short-circuiting between the secretomotor nerves that supply the parotid gland, and the nerves that innervate the sweat glands. Sweating may rarely be quite marked, and can in such cases be treated by injecting Botox intradermally. Injections may have to be repeated a few times.

### RADIATION THERAPY

Table 2 presents broad guidelines for postoperative radiation therapy for the most commonly encountered parotid tumours. Cape Town has one of a few neutron facilities internationally. Radiation therapy alone is also employed for advanced, inoperable tumours, and neutrons have proved to be particularly effective in this setting.

<p><b>Benign</b></p> <ul style="list-style-type: none"> <li>• Monomorphic adenomas</li> <li>• Pleomorphic adenomas</li> </ul> <p><b>Malignant low grade carcinoma</b></p> <ul style="list-style-type: none"> <li>• Acinic cell</li> <li>• Low grade mucoepidermoid</li> <li>• Polymorphous low grade</li> </ul>	<ul style="list-style-type: none"> <li>• Complete resection: no radiation</li> <li>• Microscopic residual: photons</li> <li>• Macroscopic residual: Neutrons / (photons)</li> </ul>
<p><b>Malignant, High grade carcinoma</b></p> <ul style="list-style-type: none"> <li>• High grade mucoepidermoid</li> <li>• Adenoid cystic</li> <li>• Adenocarcinoma</li> <li>• Squamous cell</li> <li>• Undifferentiated</li> <li>• Carcinoma ex pleomorphic</li> </ul>	<ul style="list-style-type: none"> <li>• Complete resection: no radiation</li> <li>• Microscopic residual: photons</li> <li>• Macroscopic residual: Neutrons / (photons)</li> </ul>

Table 2: Postoperative radiation therapy

### FOLLOW UP

Unlike most other malignancies, salivary malignancies may recur locally or present with distant metastases >15 years after initial treatment. Therefore patients with malignant parotid tumours need to be followed up lifelong, and require an annual CXR.

### SUBMANDIBULAR GLAND NEOPLASMS

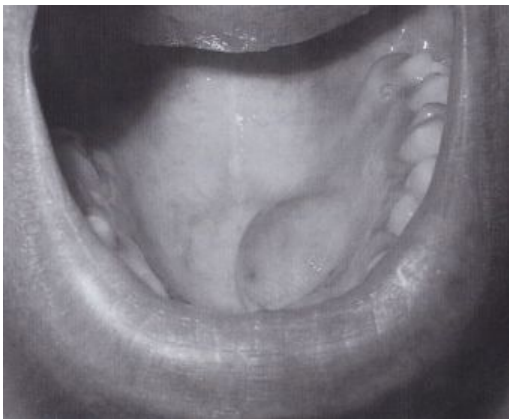
The paired submandibular salivary glands are tucked below the horizontal rami of the mandible. A neoplasm of the submandibular salivary gland generally presents as a mass arising from the gland that projects into the neck or less commonly into the lateral floor of the mouth. It has to be distinguished from other reasons for enlarged submandibular salivary glands such as sialolithiasis (calculi), sialadenitis (inflammation), and enlarged submandibular lymph nodes. Bi-digital examination of the mass, with one gloved finger on the floor of the mouth and the other on the skin overlying the mass, will generally differentiate between a lymph node (palpable only with the outside finger) and an enlarged salivary gland (palpable with both fingers), as lymph nodes are situated lateral to the salivary gland. The hypoglossal, lingual and marginal mandibular nerves pass close to the submandibular gland, and may become dysfunctional if invaded by a malignant tumour, and are also potentially at risk of injury with surgical resection. Diagnosis is by FNAC, or by resection of the mass with the submandibular salivary gland that it originated from.

## **SUBLINGUAL GLAND NEOPLASMS**

These tumours present as a smooth or ulcerated mass in the anterior floor of mouth, just behind the mandible. The mass should be biopsied in the oral cavity prior to resection, as there is a significant likelihood of it being malignant.

## **MINOR SALIVARY GLAND NEOPLASMS**

These tumours present anywhere in the mucosal lining of the upper aero digestive tract as a smooth or ulcerated mass (Figure 4). These should be biopsied prior to excision.

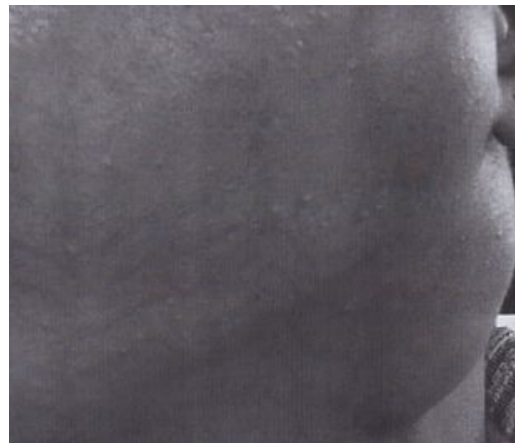


*Fig 4: Example of a minor salivary gland tumour of the hard palate*

## **HIV PAROTID LYMPHOEPITHELIAL CYSTS**

Parotid cysts may occur with a number of conditions such as traumatic sialoceles, salivary cysts, lymphangiomas, haemangiomas, tuberculous cold abscess, Sjogren's disease, hydatid disease and metastatic skin cancer and melanoma. However one should always consider HIV lymphoepithelial cysts, especially when cysts are multiple, bilateral, there are associated cervical lymph nodes,

and if the patient is HIV positive. The diagnosis is mainly clinical, and malignancy and infection can be excluded with FNAC. Ultrasound or CT scan will typically demonstrate multiple parotid and peri-parotid cysts. Cysts typically increase in size with time, may become uncomfortable, and are cosmetically disfiguring. Cysts generally reduce in size with antiretroviral therapy. Should the patient not qualify for antiretroviral therapy, then one can treat the cyst by aspirating the contents, and then injecting a sclerosant such as 90% alcohol into the cyst. As the cysts are multiple, this might have to be repeated.



*Figure 5: Typical picture of HIV-related lymphoepithelial cysts*



This work is licensed under a [Creative Commons Attribution 3.0 Unported License](https://creativecommons.org/licenses/by/3.0/).