

Original article

Management of salivary gland neoplasm – study of 32 cases

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Abstract

Objective: To study the clinical, radiological and histopathological characteristics along with the management outcome of salivary gland neoplasm. **Materials and Methods:** This study included thirty two patients (16 male and 16 female) with salivary gland tumours presented at Combined Military Hospital Dhaka, Apollo Hospital Dhaka and Ibn Sina Medical College and Hospital Dhaka from January 2006 to December 2009. The data of each patient included age, sex, presenting symptoms and signs, provisional diagnosis, preoperative investigations, operation notes, histopathological examination and state at follow up. **Results:** The mean age was 42.5 years. 14 (43.75%) patients presented at 5th decade. Main presenting symptom was swelling (100%) followed by pain (18.75%). All patients underwent fine needle aspiration cytology which was conclusive in 26 patients (81.25%). Thirty one patients underwent surgical excision. 24 cases were parotid neoplasm and 8 cases were submandibular neoplasm. 20 patients (16 parotid and 4 submandibular) were pleomorphic adenoma. **Conclusion:** There is no substitute for detailed clinical history and examination in the assessment of salivary gland neoplasm. Imaging studies are probably academic but determine the extent of the disease. Early diagnosis, adequate and proper treatment improves the prognosis.

Key words: Salivary gland tumour, Pleomorphic adenoma, Warthin's tumour, Adenoid cystic carcinoma, Mucoepidermoid carcinoma.

Introduction

Salivary gland neoplasms make up 6% of all head and neck tumours¹. The incidence of salivary gland neoplasm as a whole is approximately 1.5 cases per 100,000 individuals. An estimated 700 deaths (0.4 per 100,000 for males and 0.2 per 100,000 for females) related to salivary gland tumours occur annually². Salivary gland neoplasm most commonly appears in the sixth decade of life. Patients with malignant lesions typically present after age of 60 years, whereas those with benign lesions usually present when older than 40 years³. Benign neoplasm occurs more frequently in women than in men, but malignant tumours are distributed equally between the sexes⁴. The salivary glands are

divided into 2 groups: the major salivary glands and the minor salivary glands. The major salivary glands consist of the following 3 pairs of glands: the parotid glands, the submandibular glands and the sublingual glands. The minor salivary glands comprise 600-1000 small glands distributed throughout the upper aerodigestive tract. Among the minor salivary gland 15% are arise in the submandibular glands and the remainder arises in the sublingual and minor regions salivary glands. Most series report that about 80% of parotid neoplasms are benign adenoma which represents about 60% of all parotid neoplasm. Almost half of all submandibular gland neoplasm and most

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sublingual and minor salivary gland tumours are malignant⁶. Successful diagnosis and treatment of patients with salivary gland tumours require a thorough understanding of tumour etiology, biologic behavior of each tumour type and salivary gland anatomy.

Materials and Methods

A total 32 cases of salivary gland tumours both benign and malignant were studied. All patients were collected from the department of ENT – Head & Neck Surgery at Combined Military Hospital Dhaka, Apollo Hospital Dhaka and Ibn Sina Medical College and Hospital Dhaka during the period of 1st January 2006 to 31st December 2009. This series included all the cases which were clinically diagnosed as the salivary gland tumours and subsequently proved by histopathology. The patients were interviewed thoroughly about their occupation, exposure to irradiation especially in the neck region if any, any previous operation done to remove the tumour, habit of smoking, alcohol intake etc. After thorough and detailed history taking and clinical examination, laboratory investigations were carried out in all the cases and diagnosis was confirmed by histopathological examination after operation. Routine blood examination, fasting blood sugar, blood urea, urine examination. X-ray of the face and skull and chest X-ray were done. Pre-operative frozen section biopsy was done in suspected cases.

Results

The present series of 32 cases include the varieties of salivary gland tumours both benign and malignant. But no tumour of sublingual and minor salivary glands were found at that time and does not include in our study. The relative proportion of malignancy increasing in the smaller glands. A useful rule of thumb is the 25/50/75⁵. That is, as the size of the gland

decreases, the incidence of malignancy of a tumour in the gland increases in approximately these proportions. The most common tumour of the parotid gland is the pleomorphic.

Table I: Distribution of location of different tumours (n= 32)

Distribution of Tumours	No. of cases	%
Parotid gland	24	75%
Submandibular gland	8	25%
Sublingual gland	-	-

Table I shows the relative distribution of different tumours. Out of 32 cases parotid tumours (both benign and malignant) was 24 (75%) and that of submandibular tumour was 8 (25%). No sublingual and minor salivary gland tumour was found.

Table II: Distribution of benign and malignant tumours (n = 32)

Gland	Benign	Malignant	%
Parotid gland	18	6	75%
			25%
Submandibular gland	5	3	62.5%
			37.5%

Table II shows the distribution of benign and malignant tumours of different glands. Out of total 24 parotid tumours, 18 (75%) were benign and 6 (25%) were malignant tumours. Likewise out of 8 submandibular gland tumours, 5 (62.5%) were benign and 3 (37.5%) were malignant tumours.

Table III shows the histopathological diagnosis of different types of benign and malignant tumours of the parotid and submandibular gland. Out of 18 benign parotid tumours 16 (66.67%) were pleomorphic adenoma and only 2 (8.33%) were warthin's tumours. Out of 6 malignant parotid tumours 2 (8.33%) were mucoepidermoid carcinoma, one (4.17%) was anaplastic carcinoma, 2 (8.33%) were carcinoma in pleomorphic adenoma, one (4.17%) was adenoid cystic carcinoma. In cases of submandibular gland, out of 5

benign tumours 4 were pleomorphic adenoma and only one was warthin's tumour and out of 3 malignant tumours 2 (25%) were adenoid cystic carcinoma and 1 (12.5%) was mucoepidermoid carcinoma.

Table III: Histopathological diagnosis

	<i>Parotid gland (%)</i>	<i>Sub-mandibular gland (%)</i>
Benign tumours		
Pleomorphic Adenoma	16 (66.67%)	4 (50%)
Warthin's Tumours (Adenolymphoma)	2 (8.33%)	1 (12.5%)
Total	18	5
Malignant Tumours		
Mucoepidermoid carcinoma	2 (8.33%)	1 (12.5%)
Anaplastic carcinoma	1 (4.17%)	-
Carcinoma in pleomorphic adenoma	2 (8.33%)	-
Adenoid cystic carcinoma	1 (4.17%)	2 (25%)
Total	6	3

Table IV: Sex Distribution

Parotid	Benign	Malignant
Male	8 (44.44%)	3 (50%)
Female	10 (55.56%)	3 (50%)
Total	18 (100%)	6 (100%)
Subman-dibular	Benign	Malignant
Male	3 (60%)	2 (66.67%)
Female	2 (40%)	1 (33.33%)
Total	5 (100%)	3 (100%)

Table IV shows the sex distribution of different tumours. In benign parotid tumours incidence of female was more [10 (55.56%)] than male [8 (44.55%)] and in case of malignant parotid tumours male was 3 (50%) and female was 3(50%). In case of submandibular gland tumours, male 3(60%) patients were more than female 2 (40%) and in malignant tumours, male

incidence was 2 (66.67%) and female was 1(33.33).

Table V: Age Distribution

Age in years	No. of case	(%)
10 – 20 yrs	-	0
21 – 30 yrs	2	6.25
31 – 40 yrs	2	6.25
41 – 50 yrs	14	43.75
51 – 60 yrs	8	25.0
61 – 70 yrs	4	12.5
71 – 80 yrs	2	6.25
Total	32	100

Table V shows the distribution of salivary gland neoplasm in different age groups. Carcinoma was common in older age group and rare in children but benign neoplasm in children and adolescent was not so uncommon. Highest incidence of tumours was found in 5th decade (41-50yrs) of life (43.75% of cases). Next common age incidence have been noted in 6th decade of life (25%). In this study the highest age was 80 years.

Presenting symptoms (Common clinical presentation of patients)

Table VI (A): Parotid neoplasm

	No. of cases	Benign	Malignant
1. Swelling	32	18 (56.25%)	6 (18.75%)
2. Pain	9	-	6 (18.75%)
3. Facial nerve paralysis	2	-	2 (6.25%)
4. Skin involvement	2	-	1 (3.125%)
5. Trismus	1	-	1 (3.125%)
6. Metastasis to lung	1	-	1 (3.125%)
7. Palpable lymph node	3	-	1 (3.125%)
8. Swelling in parotid tail	2	2 (6.25%)	-

The most common and constant presentation was lump (swelling) in the parotid and submandibular region. Swelling was found in all of the cases (32) i.e., 100% cases. Pain is an important symptom of malignancy in the salivary gland and all 9 malignant tumours were associated with pain. Out of 6 malignant parotid tumours only 2 (6.25%) presented with facial nerve paralysis. Trismus was present in 1 case of parotid malignancy.

Table VI (B): Submandibular neoplasm

	No. of cases	Benign	Malignant
1. Swelling	32	5 (15.63%)	3 (9.375%)
2. Pain	9	-	3 (9.375%)
3. Facial nerve paralysis	2	-	-
4. Skin involvement	2	-	1 (3.125%)
5. Trismus	1	-	-
6. Metastasis to lung	1	-	-
7. Palpable lymph node	3	-	2 (6.25%)
8. Swelling in parotid tail	2	-	-

Table VII shows that tumour of the parotid gland does not involve whole of the gland. Generally tumour arises in a portion of the gland. Most of the benign and malignant tumours in the present series arise in front

of the ear in the parotid region. 10 benign tumours (55.56%) and 3 (50%) malignant parotid tumours arise from this regions. Next common site for the benign tumour is the inferior pole of the parotid gland. 2 (11.11%) benign and 2 (33.33%) malignant tumours arise behind the ear and in front of the mastoid process. Last of all 2 extensive benign (11.11%) and one malignant (16.67%) tumour arises in the parotid gland and involved surrounding areas.

Table VII: Location of tumours in the parotid gland (n = 24)

Site of Tumour	Number of cases (%)	
	Benign	Malignant
In front of ear lobule	10 (55.56%)	3 (50%)
Inferior pole of the gland	4 (22.22%)	-
Behind the ear and in front of the mastoid process	2 (11.11%)	2 (33.33%)
More extensive	2 (11.11%)	1 (16.67%)
Total	18	6

Table VIII: Site of Parotid pleomorphic adenoma (n = 18)

Superficial lobe	16	88.89%
Deep lobe	2	11.11%

Table VIII shows site of pleomorphic adenoma in parotid gland. 16 (88.89%) cases were in superficial lobe and 2 (11.11%) in deep lobe respectably.

Table IX: Investigations

	Cases	Pleomorphic adenoma	Warthin's tumour	Carcinoma pleomorphic adenoma	Mucoepi-dermoid carcinoma	Adenoid cystic carcinoma	Anaplastic carcinoma
1. FNAC	32	20	3	2	3	3	1
2. Sialography	2	2	-	-	-	-	-
3. Isotope scanning	3	-	3	-	-	-	-
4. CT Scan	6	-	-	2	1	2	1
5. MRI	3	-	-	-	2	1	-
6. Frozen section	3	-	-	2	1	-	-
7. Histopathology	32	20	3	2	3	3	1

Table IX shows, FNAC was done in all 32 cases of salivary gland neoplasm of which 26 cases (81.25%) was positive, 2 cases (6.25%) was false negative, 4 cases (12.50%) was doubtful/ unsatisfactory results. Sialography was done in 2 cases in suspected sialolithiasis, later on found pleomorphic adenoma. Isotope scanning was done in 3 cases of suspected warthin's tumour. In suspected malignant cases CT scan was done in 6 cases and MRI in 3 cases. All cases were confirmed post operatively by histopathology.

Table – X: Treatment

Nature of treatment modalities	Parotid gland [No.(%)]	Submandibular gland [No.(%)]
Benign tumour		
Superficial parotidectomy with preservation of facial nerve	16 (88.89%)	-
Total conservative parotidectomy	2 (11.11%)	-
Submandibular gland resection	-	5 (100%)
Total	18 (100%)	5 (100%)
Malignant tumour		
Radical surgery with preservation of facial nerve	2 (33.33%)	-
Surgery + radiotherapy	3 (50%)	-
Radiotherapy	1 (16.67%)	-
Submandibular triangle resection with suprahyoid nodal clearance + radiotherapy	-	2 (66.67%)
Submandibular triangle resection + radiotherapy	-	1 (33.33%)
Total	6 (100%)	3 (100%)

Table X shows various modalities of treatment given in the management of the cases in the present series. 16 (88.89%) patients were treated by superficial parotidectomy in case of benign parotid tumour, 2 cases (11.11%) out of 18 benign parotid tumours were treated by total conservative parotidectomy. 5 (100%) cases of benign submandibular tumour were treated by submandibular gland resection in this series. In 3 malignant

parotid tumours (50%) and one malignant submandibular tumour (33.33%) radical surgery (Excision + Debulking operation) was done followed by radiotherapy.

In one parotid tumour hemi mandibulectomy was done due to involvement of the mandible with complete inability to open the mouth. One (16.67%) parotid tumour was highly malignant and inoperable, only incision biopsy followed by radiotherapy was given to alleviate pain. 2 (33.33%) parotid low grade mucoepidermoid carcinoma were treated by radical surgery with preservation of the facial nerve. 2 (66.67%) submandibular gland adenoid cystic carcinoma were treated by submandibular triangle resection together with suprahyoid nodal clearance followed by radiotherapy.

In post operative period 8 patients developed some complications. Temporary facial weakness occurred in 3 (16.67%) patients, haematoma in 2 (11.11%) patients, infection in one (5.56%) patient and Frey's syndrome developed in one (5.56%) patient. 5 (100%) patients with benign submandibular gland neoplasm were treated by total submandibular gland resection but there was no post operative complication.

Regarding the follow up of the treated patients in the present series only 12 out of 32 patients (37.50%) could be followed up in this study, rest 20 patients (62.50%) lost follow up.

Of the 16 (operated by superficial parotidectomy) patients, no one had developed recurrence but one patient reported with permanent facial nerve paralysis of the buccal branch of the facial nerve. Another 2 patients that were followed up – one had no complication but the other had developed parotid fistula which was healed automatically. Out of 2 patients treated by total conservative parotidectomy, only one (50%) reported

with Frey's syndrome. The other patient, who developed post operative facial paresis, could not be followed up. One patient (20%) with total excision of submandibular gland (benign tumour) reported with no complication. Out of the patients treated with surgery and radiotherapy, 4 were reported. 2 were parotid & 2 were submandibular gland tumours with gross involvement of the surrounding structures.

Discussion

Out of 32 cases, 24 cases were in the parotid gland and 8 were in the submandibular gland. There were 24(75%) cases of parotid neoplasm and 8(25%) cases of submandibular neoplasm. Among the parotid neoplasm, 18(75%) cases were benign and 6(25%) cases were malignant neoplasm. Among submandibular neoplasm, 5 (62.5%) were benign and 3(37.5%) were malignant neoplasm. This result conforms to other studies⁷. Incidence of benign parotid tumour in present series shows pleomorphic adenoma in 16 cases (66.67%) which corresponds with the higher incidence in the different western series⁸. Warthin's tumour was in 2(8.33%) cases which also confirm to other studies⁸. In case of benign submandibular salivary neoplasm, pleomorphic adenoma was 4 (80%) in this series compared to 48.2% in other series⁹. Incidence of malignancy is higher in submandibular gland which confirm to other studies¹⁰. Among the parotid malignancy, mucoepidermoid carcinoma was in 2(8.33%), carcinoma in pleomorphic adenoma in 2(8.33%), adenoid cystic carcinoma in 1(4.17%) and anaplastic carcinoma in 1(4.17%) case. In this study highest numbers of patients were in the 4th & 5th decade (68.75%), which correlate with other studies¹⁰.

Regarding the sex distribution of different neoplasm, benign parotid tumours were found in 10 (55.56%) cases in female and in 8 (44.45%) cases in male. Malignant parotid neoplasm was in 3(50%) cases in

female and in 3(50%) cases in male. In submandibular salivary gland, 3 (60%) were male cases and 2 (40%) were female cases and malignant submandibular neoplasm was in 2 (66.66) cases in male and in 1 (33.33%) case in female. This correlates with other study¹¹. Regarding malignant tumour of the salivary gland, female also predominates male to some extent except squamous cell carcinoma where male predominates female. In Hiroshima after the atom bomb explosion the incidence among the exposed was higher in women¹².

In our series all the cases presented with a swelling. Size of the swelling in most pleomorphic adenoma more than 2 cm and the malignant tumour varied between 2 to 4 cm. The longer the duration larger the swelling. The two deep lobe tumours of parotid pleomorphic adenoma presented with a swelling in palate and tonsil. Patients reported with signs of malignancy are pain in 9 (28.13%) cases, facial nerve paralysis in 2 (6.25%) cases, fixation to skin in 2 (6.25%) cases, trismus in 1 (3.12%) case, lymph node metastasis in 2 (6.25%) cases and distal metastasis in 1 (3.12%) case.

9 patients presented with pain in the tumour region – with radiation to the ear and head of which all had malignant tumour. In this series pain in the malignant tumour was present in all cases, in one case it was intractable due to involvement of the base of the skull and perineural sheath and this was inoperable case.

Generally facial nerve paralysis occurs in only 1/3rd of all cases of malignant parotid tumours¹³. In the present series out of 6 malignant parotid tumours 2 patients had paralysis of the facial nerve the incidence being (33.33%). No benign tumour had facial nerve involvement. According to other study¹⁴ involvement of the facial nerve in the malignant parotid tumour is 40%.

Tumours of the parotid gland do not involve the whole gland. In the present series 10 (55.56%) benign tumour & 3 (50%) malignant tumours appear in front of the ear lobule. 4 (22.22%) benign tumours arise from inferior pole of the gland. 2 (11.11%) benign tumours and 2 (33.33%) malignant tumours arise from the area behind the ear and in front of mastoid process. In both benign and malignant tumours of the submandibular gland, the whole gland was involved clinically. In one patient, anaplastic carcinoma involved the whole of the left side of the face and neck with facial nerve paralysis and another patient had wide local invasion of parotid tumour with involvement of the temporomandibular joint. Frazell¹⁵ showed that 62.7% of the parotid tumours appeared in front of the ear lobule. In this series 13 (54.17%) parotid tumours were present in front of the ear lobule. It seems most of the tumours used to appear in front of the ear lobule but the cause for preference of this region is not known.

Regarding investigation in the present study, FNAC was done in all 32 cases (100%), of which 26 cases (81.25%) were positive, 2 cases (6.25%) were false negative and 4 cases were doubtful/unsatisfactory results, which also conforms to other studies¹⁶. Sialography was done in 2 cases in suspected sialolithiasis. Isotope scanning with technetium ⁹⁹ was done in 3 cases of suspected warthin's tumour. In suspected malignant cases, CT scan was done in 6 cases and MRI in 3 cases. Histologically all cases were confirmed post operatively by histopathological examination.

Medical imaging gives useful information about topography of the tumour and helps in planning the treatment. Ultrasound has little place in modern treatment, again except in inflammatory conditions. It is not-invasive, harmless, painless, quick and cheaper. It distinguishes between solid and cystic lesions. It may be useful for vascular

tumours in children, in detection of ectopic tumours and in the follow-up for early diagnosis of recurrence. CT scan demonstrates the parenchyma of the gland and is routinely used by some clinicians. Recently, MRI has been found to be superior to CT particularly under the following circumstances¹⁷:

- (1) To determine the exact site and extent of the lesion,
- (2) In cases of deep lobe tumour,
- (3) In suspicion of malignancy,
- (4) In cases of recurrent tumour,
- (5) In parotid swelling with reduced mobility.

Current reports¹⁷ suggest that a good quality T2 weighted image can delineate the position of the facial nerve with respect to the tumour. Here in this series only 6 patients had CT scan which only confirmed the clinical picture and determined the extent in cases of malignant tumours.

Almost all the patients in this series were subject to some forms of surgery. Most of them were treated by superficial or total parotidectomy/ submandibular triangle resection + block dissection/ radiotherapy, which is also in agreement with the general principle of treatment of salivary gland neoplasm¹⁸. Only one case was inoperable and treated with radiotherapy.

None of the pleomorphic adenoma showed any recurrence. The warthin's tumours were followed up between 6 months to 1 year and none showed any recurrence. Out of 9 patients with malignant tumours (both parotid and submandibular gland) treated by surgery and/or radiotherapy, only 3 (33.33%) achieved local control of tumour. These patients relieved of pain and the tumour did not grow during the follow up period. Other 6 (66.67%) patients got minimum benefit from surgery or radiotherapy and there was recurrence within 6 months. Beahrs *et al*¹⁹, (1960) reported post operatively local recurrence

rate of 37.6% for moderately malignant and 72.5% for highly malignant tumours of the parotid gland.

Conclusion

There is no substitute for detailed clinical history and examination in the assessment of salivary gland neoplasm. MRI has proved to be superior to CT scan as far as parotid neoplasm is concerned. FNAC is a useful tool for preoperative diagnosis. The management of patients with submandibular gland diseases is

challenging. Accurate clinical diagnosis can often be obtained after good history taking, through examination and the use of selective investigations in both parotid and submandibular neoplasm. Early diagnosis, adequate and proper treatment improves the prognosis. Parotidectomy is still the treatment of choice for parotid neoplasm. Superficial parotidectomy is preferred to enucleation which was practiced earlier. In suspected cases of malignancy frozen section biopsy is a useful tool for preoperative diagnosis.

References

1. Eisele, DW, Johns, ME. Salivary Gland Neoplasm. In, *Head & Neck Surgery-Otolaryngology*, Ed, BJ Bailey. Philadelphia, Lippincott Williams & Wilkins; 2004: 1279-1297.
2. Eds. Seifert, G, Miehke, A, Haubrich, J, Chilla, R. *Diseases of the Salivary Glands*. New York, Thieme Inc; 1996: 539-40.
3. Califano, JC, Eisele, DW. Benign Salivary Gland Neoplasm. *Otolaryngology Clinics of North America*. Oct 1999, 35 (5); 861-873.
4. Rice, DH. Malignant Salivary Gland Neoplasm. *Otolaryngology Clinics of North America*. Oct 1999, 35 (5); 875-886.
5. Kelly, DJ, Spiro, RH. Management of the parotid neoplasm. *American Journal of Surgery*. Dec 1996, 172; 695-697.
6. Stewart, CJ, MacKenzie, K, McGarry, GW, Mowat, A. Tumours of salivary gland: a review of 341 cases. *Diagnostic Cytopathology*. 2000, 22 (3); 139-146.
7. Conley J, Myers E, Cole R: Analysis of 115 patients with tumours of the submandibular gland. *Annals of Otolaryngology, Rhinology and Laryngology*, 1992; 81: 323-330.
8. Spiro RH, Haros AG and Strong EW: Cancer of the parotid gland, A Clinical pathologic study of 288 primary cases. *Am. J. Surg.* 1995; 452-459.
9. Evans RW, Cruickshank AH: Epithelial tumours of the salivary glands, Philadelphia, 1990; WB Saunders, pp: 13-16.
10. Shaneen OH: Benign salivary gland tumours. In: Scott-Brown's otolaryngology. 6th edition. Volume 5, Butterworth Heinemann, pp: 431-448.
11. Cesteley, L, Smith RG, Akuamo-Boateng, E, Kovacs B, Peiffer R: Current diagnosis and therapy of parotid tumors. *Acta Stomatologica Belgica*, 1990: 88: 157-170.
12. Tran L, Sadeghi A, Juilliard G, Calcattera T, Hanson D, Mackintosh R, Parker RG: Major salivary gland tumours: treatment results and prognostic factors. *Laryngoscope*, 1997; 96(10): 1139-1144.
13. Eneroth C: Parotid tumours and facial nerves: Surgery of the Facial Nerves Philadelphia WB Saunders Co. 1996; pp – 125.
14. Maran AGD: Tumours of major salivary glands. In: *Head and neck surgery*. 3rd edition. Butterworth- Heinemann Ltd. 1993; pp 269-295.
15. Frazell EI: Observation on the management of salivary gland tumours *Cancer*, 2003; 235-240.
16. Eneroth CM, Franzen S, Zajicek J: Cytologic diagnosis of an aspirate from 1000 salivary gland tumours. *Acta Otolaryngologica*, 1997; (Suppl 224): 168-171.
17. Fouts FW, Frazell EL: Tumours of the major salivary glands *Cancer*, 2003; 6: 1065-1133.
18. Behrs GH, Woolner LB, Carveth SW, and Devine KD: Surgical management of salivary lesion review of 760 cases, *Arch, Surgery*, 2000, 80; 890-904.
19. Skolink EM, Friedman M, Becker S, Sisson GA, Keyes GR: Tumours of the major salivary glands. *Laryngoscope*, 1997; 37: 843-861.