

A Clinical Study on Salivary Gland Tumours in a Tertiary Health Care Setup

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ABSTRACT

BACKGROUND

Salivary gland (SG) neoplasms are rare, constitute of 3 - 4 % of head and neck tumours. 70 - 80 % of SG neoplasms occur in parotid gland. These are unique in the way they present, generally slow growing. A study was conducted to analyse various modes of presentation of SG tumours and to review the role of FNAC (Fine Needle Aspiration Cytology) in the diagnosis of SG tumours.

METHODS

This was a prospective study, conducted in the department of surgical oncology, October 2016 to July 2018. Individuals aged >18 years, came with swelling of the SGs were considered. Swellings that were not neoplasms, the individuals with inflammatory or infections of SGs, autoimmune diseases were excluded. Statistical analysis were performed by SPSS software version-21 and MS excel 2013.

RESULTS

Out of 40 participants, male female ratio was 2.07. The age was ranged between 31 – 70 years, maximum (80 %) members were in 41 – 60 group. Parotid gland was the most commonly followed by submandibular gland (20 %). Swelling alone was observed in 82.5 % (33) cases, two cases (5 %) presented with swelling along with pain with facial nerve involvement.

CONCLUSIONS

SG tumours occur in 4th to 6th decade, common among men. Parotid gland is most frequently involved, most often benign. FNAC had good accuracy in diagnosis and surgery is the main modality of treatment.

KEYWORDS

Salivary Gland, Tumour, Neoplasms, FNAC

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BACKGROUND

Salivary Gland (SG) neoplasms are rare, constitute of 3 - 4 % of head and neck tumours. 70 - 80 % of SG neoplasms occur in parotid gland, of which 80 % are benign, 20 % are malignant and out of benign tumours 80 % are pleomorphic adenomas.¹ Submandibular gland tumours constitute 22 % of tumours and sublingual gland tumours constitute of 8 % of all major SG tumours. In submandibular SGs, 50 % are benign and rest are malignant. In sublingual glands, 85 % are malignant and only 15 % are benign. The incidence of malignancy in submandibular gland is higher than parotid gland and the prognosis is poorer than parotid malignancies.² SG tumours are interesting to the surgeons, as they are unique in the way they present, that is with a diverse array of clinical patterns and varied histological patterns. So, there are benign and malignant tumours and again several pathological subtypes in each.

SG tumours are generally slow growing and have been present for several years before the patients seek medical advice. Because most of them are benign in nature and due to lack of health awareness in our setup, the number of patients seeking the treatment is less. Thus, the patients with the malignant tumours present very late and need radical treatment which carries high morbidity. Though the carcinoma of SG is an uncommon disease accounting for less than 1 % of all head and neck malignant neoplasms, yet it provides a challenge to surgeon and radiation oncologist. These tumours display a diverse clinical presentation depending on the stage and grade of tumours. Ultimately there are no reliable criteria to differentiate on clinical grounds, the benign from the malignant lesions and morphological evaluation is necessary.³

Treatment of SG tumours need good surgical skills, sound anatomical knowledge as there are vital structures with both parotid and submandibular gland. Factors such as advanced age, tumour site, treatment modality can predict 5-year survival rate in SG tumours.⁴ Survival in parotid malignancy is influenced by multiple factors. Patients with multiple poor prognostic features include extra glandular extension, aggressive tumour histology and nodal disease will exhibit poorer survivals and may be candidates for aggressive treatment protocols.⁵

A study was conducted to analyse the various modes of presentation of SG tumours and to review the role of FNAC in the diagnosis of SG tumours.

METHODS

This was a prospective observational time bound, hospital-based study. It was conducted in the Department of Surgical Oncology, GSL Medical College, Rajahmundry, Andhra Pradesh. Study was conducted from 1st October 2016 to 31st July 2018. Patients admitted with SG tumours in the Department of General Surgery, GSL Medical College, Rajahmundry, Andhra Pradesh, all the individuals who satisfied the inclusion criteria, admitted in Department of

Surgical Oncology, GSL Medical College during the study period were considered.

Individuals aged 18 years or more, who came with swelling of the SGs and those who submitted informed consent were considered. Swellings that were not neoplasms of SGs, the individuals with inflammatory or infections of SGs, individuals with autoimmune diseases, individuals who did not submit the informed consent were excluded from the study. The study protocol was approved by the Institutional Ethics Committee.

All patients who came with history of swelling in the SG regions, were taken up for the study. Thorough history and clinical examination were done for all patients. In addition to the routine investigations, FNAC was done for all patients. Treatment planning was done as considered appropriate depending on clinical findings and investigations results. Postoperative complications were recorded. All patients were followed up for a period ranging from 1 to 6 months.

Statistical Analysis

All statistical analysis was performed by SPSS software version-21 and MS excel 2013. Results were presented as numbers and percentages. Bar diagrams and pie charts were drawn wherever needed.

RESULTS

40 participants were included in the study. Among them, 67.5 % were male members and 32.5 % were female participants (Table 1). The male female ratio was 2.07. The age was ranged between 31 – 70 years. Total, 12.5 % (5) participants were included in 31 – 40 years group, 45 % in 41 – 50 group, 35 % in 51 – 60 group, 35 % in 51 – 60 years group and 7.5 % were included in 61 – 70 years group (Table 2). In this study, parotid gland was the most commonly (80 %) involved in cases of neoplasms followed by submandibular gland (20 %) (Table 3). Swelling alone was observed in 82.5 % (33) cases, two cases (5 %) presented with swelling along with pain with facial nerve involvement. The remaining (12.5 %, 5) were presented with swelling with pain.

In parotid gland involved cases, most of the tumours were benign (93.75 %). The benign malignant ratio was 15 and 7 respectively in parotid and submandibular glands (Table 4). Out of 40 cases, there was matching between FNAC and biopsy findings in 38 cases whereas in 2 cases there was mismatch in diagnosis of tumours. One case was identified as PLA (Pleomorphic adenomas) in FNAC, whereas it was found as MEC (Mucoepidermoid carcinoma) on biopsy (Table 5). Similarly, one case was identified as MEC on FNAC which was confirmed as PLA on biopsy. Sensitivity was 66.67 % and specificity was 97.30 % with diagnostic accuracy of 95 %. The most common tumours in the present study are pleomorphic adenomas, majority of them involving the parotid gland. Mucoepidermoid carcinoma is the most common malignant tumour.

| Gender | Number | Percentage |
|--------------|-----------|------------|
| Male | 27 | 67.5 |
| Female | 13 | 32.5 |
| Total | 40 | 100 |

Table 1. Gender Wise Distribution of the Study Participants

| Age | Male | Female | Total |
|--------------|------------------|------------------|-----------------|
| 31 – 40 | 3 (7.5) | 2 (5) | 5 (12.5) |
| 41 – 50 | 14 (35) | 4 (10) | 18 (45) |
| 51 – 60 | 8 (20) | 6 (15) | 14 (35) |
| 61 – 70 | 2 (5) | 1 (2.5) | 3 (7.5) |
| Total | 27 (67.5) | 13 (32.5) | 40 (100) |

Table 2. Age Wise Distribution of the Study Participants; n (%)

| Gland | Male | Female | Total |
|---------------|------------------|------------------|-----------------|
| Parotid | 23 (57.5) | 9 (22.5) | 32 (80) |
| Submandibular | 4 (10) | 4 (10) | 8 (20) |
| Total | 27 (67.5) | 13 (32.5) | 40 (100) |

Table 3. Gland Wise Distribution of the Study Participants; n (%)

| Gland | Benign | Malignant | Total |
|---------------|------------|-----------|----------|
| Parotid | 30 (93.75) | 2 (6.25) | 32 (100) |
| Submandibular | 7 (87.5) | 1 (12.5) | 8 (100) |

Table 4. Distribution of Salivary Gland Neoplasms among the Study Participants; n (%)

| FNAC | Biopsy | | Total |
|--------------|----------------|------------------|-----------------|
| | MEC | PLA | |
| MEC | 2 (5) | 1 (2.5) | 3 (7.5) |
| PLA | 1 (2.5) | 36 (90) | 37 (92.5) |
| Total | 3 (7.5) | 37 (92.5) | 40 (100) |

Table 5. Comparison of FNAC and Biopsy Results Among the Study Participants; n (%)

DISCUSSION

This study reflected the features of the SG tumours among the population in and around Rajahmundry in general. In the present study, the age group that was most commonly affected is 41 to 60 years. This is higher than that of the Izandro R B S et al.⁶ study where the peak incidence is noted in 31 to 50-year-old group and that of Edda A M V et al.⁷ observation where the mean age at diagnosis is 38.1 years. Malignancies usually involve elder age group people and it is similar to the present study. The prevalence of SG tumours as per the present study was more among males (67.5 %) than females (32.5 %). There was male gender predilection for SG tumours as per the current data. This was not in concurrence with previously published studies on SG neoplasms. According to Izandro R B S et al.⁶, the incidence of SG tumours in males and females is 43.3 % and 56.7 %, respectively. Edda A M V et al.⁷ documented the incidence to be 42.2 % in males and 55.2 % in females as per their observation. The gender was not specified in 2.6 % of cases. However, male preponderance was reported by Fenn A.S. et al.⁸ and Renehan et al.⁹

The most commonly involved SG in the present study was parotid, which was in consistency to the documented literature. The incidence of tumours in parotid gland was 80 % in the current study, this was 70 % as per Robert R L et al.¹⁰ The next most commonly involved gland is submandibular gland (20 %). There were no cases of neoplasms of sublingual and minor SGs documented in the present study. This might be due to the small sample size of the study. As our centre was not a specialized head and neck cancer centre and the study period being only for about 2

years no cases of neoplasms of sublingual and minor SGs were encountered. Fenn AS et al.⁸ reported 70.2 % parotid, 22.8 % submandibular and 7 % sublingual glands involvement. Everson JN et al.¹¹ mentioned 72.9 % parotid, 10.7 % submandibular and 0.3 % sublingual glands involvement.

Patients with SG swellings usually present as painless swelling in the region of concerned SG (parotid and submandibular in this study). Patients with parotid gland tumours presented with a swelling typically in front of ear lobe. In most of the cases the swelling elevated the ear lobule on ipsilateral side with obliteration of ipsilateral retromandibular groove. The submandibular gland swellings presented in the submandibular triangle. All the patients irrespective of the gland involved and the type of tumour presented with swelling of varied duration.

The second most common symptom in this study was pain. 3 cases (9.3 %) of parotid tumours presented with pain along with the swelling out of 32 cases, while 2 cases (25 %) of submandibular tumours presented with pain out of the 8 cases. The incidence of pain as a symptom is more common in submandibular gland tumours as compared to parotid gland tumours. Apart from the above-mentioned cases, 1 case of recurrent pleomorphic adenoma of parotid presented with facial nerve palsy along with swelling and pain. Amongst the pleomorphic adenomas of parotid, deep lobe involvement is seen in 4 cases. One case of mucoepidermoid carcinoma of parotid gland presented with facial nerve palsy along with swelling and pain.

Benign tumours constituted 37 cases (92.5 %) of the study and the remaining were malignant. Among the benign tumours, the most common histopathological variant is pleomorphic adenoma which comprised 37 cases (92.5 %). Though pleomorphic adenoma amount to the most common neoplasm in other studies also, the percentage of cases diagnosed as pleomorphic adenoma in this study is more than that of the documented percentages. Pleomorphic adenoma constituted 74.3 % of cases in Izandro R B S et al.⁶ study and 74.8 % in Edda A M V et al.⁷ study.

The most common malignant SG neoplasm in this study was mucoepidermoid carcinoma which comprised 7.5 % of all tumours in the study. The results from Pinkston JA et al.¹² also shown that mucoepidermoid carcinoma was the most common malignancy in SG tumours. Similar to our study findings, more percentage of benign tumours were reported by Eversole¹³, Spiro R H¹⁴, Arathi Bhatia¹⁵, Renehan et al.⁹ and Cajulis RS.¹⁶

FNAC is widely accepted as initial investigation of choice in SG tumours in conjunction with other investigations.^{17,18,19} The fact that FNAC is more sensitive in benign tumours than in malignant tumours which was reflected in the study. This is in accordance to the above-mentioned study by Ashraf A et al.²⁰ The overall sensitivity and specificity of FNAC in diagnosing SG tumours was 66.67 % and 97.3 % respectively, which is different to that of the values obtained by Gandhi DSH et al.²¹ mentioned 97.5 % and 100 % respectively. So, the present study ratifies FNAC to be an initial investigation of choice in SG tumours.

Superficial conservative parotidectomy was the most commonly performed procedure in the present study. Facial nerve and its branches are identified in all the cases and utmost care is taken to prevent injury to the nerve and intervening blood vessels. Eight patients with deep lobe involvement of the parotid underwent total conservative parotidectomy where the deep lobe of the tumour is excised along with the superficial lobe with preservation of facial nerve. Another patient of mucoepidermoid carcinoma of parotid gland underwent total conservative parotidectomy. In a case of recurrent pleomorphic adenoma and mucoepidermoid carcinoma with signs of facial nerve palsy, total conservative parotidectomy with modified radical neck dissection is performed. For tumours arising from submandibular gland, excision of the submandibular gland is performed in all the 8 cases. In the submandibular gland excision, care is taken to safeguard the important vessels and nerves i.e., facial artery and vein and lingual nerve and hypoglossal nerve during the surgery.

The most common postoperative complication in the current study is facial nerve injury in 3 cases and wound infection in 2 cases. The case with temporary palsy of the facial nerve, was a recurrent pleomorphic adenoma in which patient preoperatively presented with facial nerve palsy. Total conservative parotidectomy with clearance of the tumour from the surface of facial nerve is performed carefully in this case. The temporary palsy subsequently recovered by 6 weeks. The complete transection of facial nerve occurred in two cases of pleomorphic adenoma of parotid gland where the tumour was adherent to the facial nerve. Transection of the nerve occurred while trying to dissect the nerve free from the tumour tissue. End to end anastomosis of the cut ends of the nerve was done in the same surgery but without any positive outcome. Similar findings were reported in the literature.^{22,23}

Wound infection was observed in two cases. One was total conservative parotidectomy, which subsided with a course of antibiotics and daily dressings of the wound and the other was superficial conservative parotidectomy. No cases with complications like haemorrhage, sialocele or salivary fistula, Frey's syndrome or flap necrosis were documented in the current study. Similarly, no major complications were observed in the eight submandibular gland excisions that were performed in the study. However, Owen ERTC et al.²⁴ reported 11 % cases with Frey's syndrome.

CONCLUSIONS

Individuals with SG swelling should be investigated for SG tumours. They occur commonly in 4th to 6th decade and are common among men. Parotid gland is most frequently involved, and is most often benign. FNAC had good accuracy in diagnosis and surgery is the main modality of treatment. Long term follow up is necessary as SG tumours tend to recur after long period of time.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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REFERENCES

- [1] Moyer JS, Teknos TN. Head and neck, salivary gland neoplasms. Chap - 42. In: Mulholland MW, Lillemoe KD, Doherty GM, et al. eds. Greenfield Surgery Textbook of Scientific principles of practice. 4th edn. Philadelphia: Lippincott Williams and Wilkins 2006: p. 647-655.
- [2] Khalid M, Durrani MB. Malignant mixed tumours of the submaxillary gland. J Plast and Recons Sur 1964;33(3):237-246.
- [3] Lingen MW. Head and neck, salivary gland neoplasms. Chap - 16. In: Kumar, Abbas, Fausto, et al. eds. Robbins's and Cotran Pathologic basis of disease. 8th edn. Philadelphia: Elsevier Publications 2010: p. 756-761.
- [4] Koul R, Dubey A, Binahmed A, et al. Prognostic factors depicting overall survival in lesser major submandibular, sublingual glands. Turkish J of Cancer 2008;38(4):159-166.
- [5] Bhattacharya N, Fried MP. Determinants of survival in parotid gland carcinoma: a population based study. Am J Otolaryngol 2005;26(1):39-44.
- [6] Santos IRB, Kowalski LP. Benign tumours parotid glands: retrospective analysis of a series of 222 cases. Bra J Otolaryngology 2000;66(2):94-100.
- [7] Edda AM, Vuhahula. Salivary gland tumours in Uganda: clinical pathological study. African Health Sciences 2004;4(1):15-23.
- [8] Fenn AS. Salivary gland tumours. Ind J Cancer 1982;44:101-104.
- [9] Renehan A, Gleave EN, Hancock BD, et al. Long term follow up of over 1000 patients with salivary gland tumours treated in single center. Br J Surg 1996;83(12):1750-1754.
- [10] Lorenz RR, Couch ME, Burkey BB. Head and neck. Chapter - 35. In: Townsend CM Jr, edr. Sabiston Textbook of Surgery: the biological basis of modern surgical practice. 19th edn. Philadelphia, PA: Elsevier Saunders 2012: p. 793-822.
- [11] Everson JW, Cawson RA. Salivary gland tumours, a review of 2410 cases with particular reference to histologic types, sites, age and sex distribution. J Path 1985;146(1):51-58.
- [12] Pinkston JA, Cole P. Incidence rates of salivary gland tumours: results from a population-based study. Otolaryngol Head Neck Surg 1999;120(6):834-840.
- [13] Eversole RL. Histological classification of salivary tumours. Arch Pathol 1921;92:433-443.
- [14] Spiro RH. Salivary neoplasms: overview of 35 years' experience with 2,807 patients. Head & Neck Surg 1986;8(3):177-184.
- [15] Bhatia A. Fine needle aspiration cytology in the diagnosis of mass lesion in salivary gland. Ind J Cancer 1993;30:26-30.

- [16] Cajulis RS, Gokaslan ST, Yu GH, et al. Fine needle aspiration biopsy of salivary gland a 5 year experience with emphasis on diagnostic pitfalls. *Acta Cytol* 1997;41(5):1412-1420.
- [17] Nanda KDS, Mehta A, Nanda J. Fine-needle aspiration cytology: a reliable tool in the diagnosis of salivary gland lesions. *J Oral Pathol Med* 2012;41(1):106-112.
- [18] Chan JK, Yip TT, Tsang WY, et al. Specific association of Epstein-Barr virus with lymphoepithelial carcinoma among tumours and tumourlike lesions of the salivary gland. *Arch Path Lab Med* 1994;118(10):994-997.
- [19] Horn-Ross PL, Ljung BM, Morrow M. Environmental factors and the risk of salivary gland cancer. *Epidemiol* 1997;8(4):414-419.
- [20] Ashraf A, Shaikh AS, Kamal F, et al. Diagnostic reliability of FNAC for salivary gland swellings: a comparative study. *Diag Cytopathol* 2010;38(7):499-504.
- [21] Gandhi SH, Purohit TM, Purohit MB, et al. FNAC diagnosis of salivary gland lesions with histopathological correlation. *National J Integrated Research in Medicine* 2013;4(3):68-75.
- [22] Anson BJ, McVay CB. *Surgical anatomy*. 5th edn. Philadelphia: Saunders 1971: p. 206.
- [23] Stringer MD, Mirjalili SA, Meredith SJ, et al. Redefining the surface anatomy of the parotid duct: an in vivo ultrasound study. *J Plastic & Reconstr Surg* 2012;130(5):1032-1037.
- [24] Owen ER, Banerjee AK, Kissin M, et al. Complication of parotid surgery. The need for selectivity. *Br J Surg* 1989;76(10):1034-1035.