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RESEARCH ARTICLE

CLINICO PATHOLOGICAL STUDY OF SALIVARY GLAND SWELLINGS AND ITS MANAGEMENT

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ABSTRACT

Salivary gland swelling commonly encountered in routine surgical practice can present with diverse pathology and associated with various etiologies like inflammation, sialolithiasis and tumors. Clinical examination often helps to differentiate between cysts, inflammation and tumor. Wide range of patients with acute bacterial and viral infection of the salivary glands present with varied symptomatology and severity. Successful management of the salivary gland swelling depends on accurate clinical assessment and diagnosis, with appropriate use of fine needle aspiration and CT or MRI imaging. Moreover, knowledge about individual tumour type guides the development of an appropriate treatment plan for individual patient.

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INTRODUCTION

The salivary glands of the upper aero digestive tract play a critical role in digestion, respiration, communication, and overall homeostasis. The major salivary glands are the paired parotid, sub mandibular and sublingual glands. The remaining are the thousands of small minor salivary glands that line the oral cavity and can be found in the pharynx, supraglottis, nasal cavity, and paranasal sinuses. These glands produce saliva, which helps in digestion, immunity, dental hygiene, lubrication, and hydration (Daniel *et al.,* 2005). Salivary gland tumours are less commonly encountered in surgical practice and constitute 3-4 % of head and neck tumours. The incidence of parotid gland tumours is between 1-3 / 1, 00,000 per year, approximately 75 – 85% of the salivary gland neoplasm occur in parotid gland of which 70-80% is benign and 80% benign tumours are pleomorphic adenoma. 80% of parotid tumours are located in the superficial lobe.

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Deep lobe neoplasms are associated with greater incidence of malignancy. Although mostly observed in adults, salivary gland tumors occur in all age and both sex. They exhibit a wide variety of behaviour and widely diversified histology. In this part of the world, management is more troublesome because of lack of awareness, late presentation and poor economic status.

Acute inflammatory conditions generally can be diagnosed by history and physical examination alone where as chronic inflammatory diseases and granulomatous disorders require other diagnostic information including laboratory tests, imaging studies or biopsy (Charle's W.Cummings, 2010). An accurate pathological diagnosis is necessary for proper management of the neoplastic disorders. Surgical resection is the main stay of treatment for both benign and malignant salivary gland tumours. Adjuvant radiation therapy is administered in selected malignant salivary gland neoplasms, and chemotherapy may have palliative benefit in malignant neoplasms (Charle's W.Cummings, 2010). The aim of this article was to study the clinical presentation, pathophysiology,

differential diagnosis and management of salivary gland swellings. Compare FNAC and histopathology of salivary gland swelling post operatively.

MATERIALS AND METHODS

This is a 3 year prospective study of salivary gland swelling managed at Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore from November 2010 to October 2013. All the clinical, investigational, operative, pathology details and Follow-up data were collected from patient records. 35 patients with swelling in the salivary glands were included. Paediatric patients, lymph node swellings were excluded.

RESULTS

Swelling was the commonest complaint of the patients at the time of presentation (Table 1). Males are most commonly affected (Fig. 1). The age group ranged from 20 to 65 years and average age of the patient was 42.5 years (Fig.2). The highest incidence was seen between 3rd and 4th decades of life. Parotid gland was the commonest site for salivary gland swelling (Table 2). Neoplasia was most common cause (Table 3) with submadibular sialadenitis being most common non neoplastic etiology (Table 4). Benign tumors are more common than the malignant tumors (Fig.3). Pleomorphic adenoma and mucoepidermoid carcinoma are most common benign and malignant tumors (Table 5).

Table 1. Mode of clinical presentation

MODE	No. of Cases	Percentage
Swelling	35	1 00
Pain	7	2 0.00
Fever	3	8.57
Increased Salivation	4	1 1.42
Fixity of Swelling	-	0 0.00
Ear Lobe Elevation	14	4 0.00
Deep Lobe Involvement	4	1 1.42
Facial Nerve Paralysis	1	2.85

Table 2. Site for various salivary gland swellings

No. of Cases	Parotid	Submandibular	Sub Lingual
35	25 (71.42%)	8 (22.85%)	2 (5.71%)

Table 3. Various causes of salivary swelling

Lesions	No. of cases	Percentage
Inflammatory Swelling	7	20.00
Non Inflammatory	3	08.57
Neoplastic	25	71.43
Total	35	100

Table 4. Incidence of inflammatory and non Inflammatory non Neoplastic Swellings

Lesions	No. of Patients	Percentage
Submandibular Sialadenitis	4	33.34
Parotid abscess	3	25.00
Sialolithiasis	1	08.34
Parotid cyst	2	16.66
Ranula	2	16.66
Total	12	100.0

Table 5. Incidence of various salivary glands tumours

LESION	No. of cases	Percentage
Pleomorphic Adenoma	19	82.60
Mucoepidermoid carcinoma	3	13.05
Acinic cell carcinoma	1	04.35
Total	23	100.0

Table 6. Fnac and Histopathology

LESIONS	No. of patients	FNAC (%)	BIOPSY (%)
Pleomorphic adenoma	18 (19)	94.7%	100.0
Mucoepidermoid carcinoma	3	100.0	100.0
Acinic cell carcinoma	1	-	-

Table 7. Surgical procedures adopted for various Salivary gland swellings

PROCEDURES	NO. OF Patients	Percentage
Excision of submandibular gland	8	23.53
Superficial parotidectomy	17	50.00
Total parotidectomy	4	11.76
Excision of Ranula	2	05.88
Incision & drainage	3	08.83
Total	34	100.0

Table 8. Post operative complications

Nature of Compli Cations	No. of Patients	Percentage
Facial nerve paralysis	2	5.88
Mandibular nerve paralysis	1	2.94
Wound infection	5	14.70

Table 9. Fnac comparision with pathologic diagnosis

Series	Benign	Malignant
Frable and Frable77 1982	91%	92%
Spiro RH et al78 1974	98%	93%
Present Study	94.72%	100%

Table 10. Location of various tumours

Series	Parotid	Submandibular	Sublingual
Budhraja et al73 1974	82.10%	12.40%	5.5
Sharkey F.E. et al74 1977	80.50%	6.00%	9.0
Everson et al75 1985	72.90%	10.70%	16.4
Rehehan et al67 1996	91.00%	4.0%	5
Present study	86.95%	13.04%	-

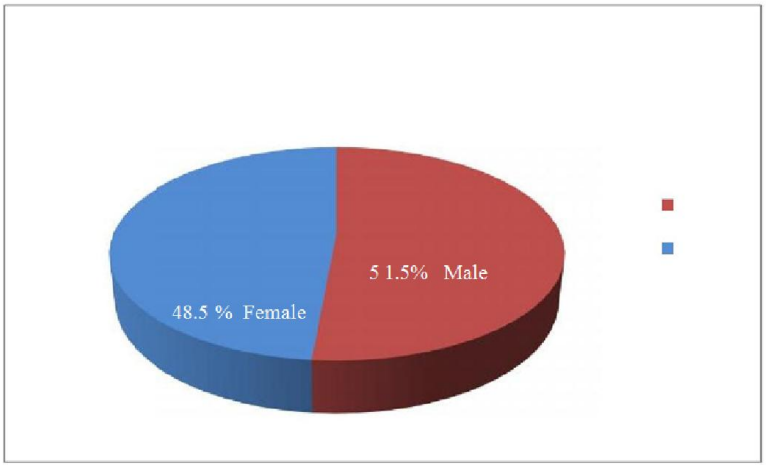

Figure 1. Sex incidence

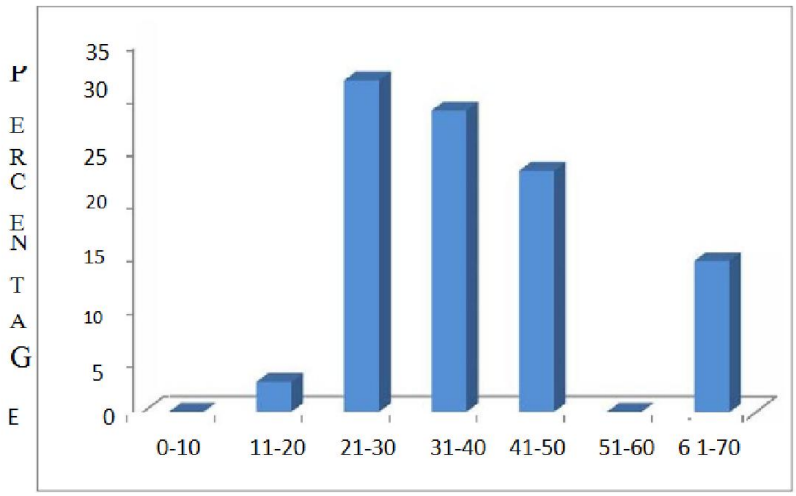

Figure 2. Age incidence

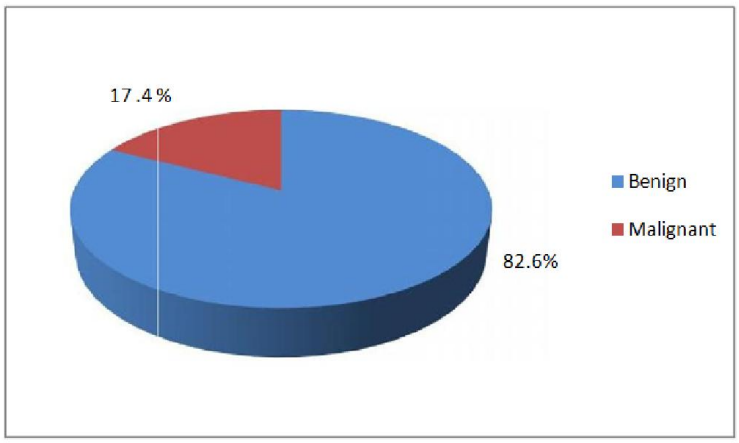

Figure 3. Incidence of benign and malignant salivary gland tumour

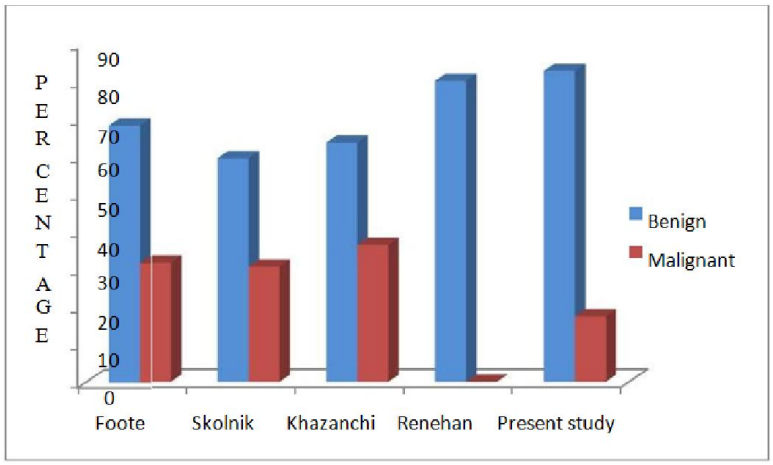

Figure 4. Frequency of benign and malignant salivary tumours

Sensitivity of FNAC was less compared to final histopathology (Table 6). Surgery is the treatment of choice in all the salivary swellings with superficial parotidectomy being most common procedure (Table 7) and wound infection was most common post operative complication (Table 8). In our study mortality was nil with no recurrence. With proper diagnosis and appropriate treatment, salivary gland swellings can be cured with almost 100%.

DISCUSSION

Salivary glands can be affected by wide variety of disorders. Bacterial and viral infections play a most important role in the etiopathogenesis of salivary gland swellings (Courtney *et al.,* 2004; McAnnally *et al.,* 1982). Calculus formation is associated frequently with acute bacterial infections and 85 to 90% salivary calculi are located in submadibular duct. Submadibular secretions are more mucinous than parotid and therefore more viscid. They are also more alkaline containing a higher percentage of calcium phosphates these characteristics contribute to the formation of calculi (Radd *et al.,* 1990). Neoplasia is a very important cause of salivary gland swelling with benign pathology constituting majority. In concordance to other studies our series too had benign tumours predominating (Fig. 4).

Sialadenosis is non- specific inflammatory swelling of unknown etiology, but are associated with nutritional deficiencies (Dale H Rice Malignant salivary gland neoplasms, 1999). In general little is known about the cause of salivary gland tumours and many factors have been implicated in the causation of salivary gland tumours (Dardic, 1982). Substantial evidences exist which suggests a relationship between exposure to ionizing radiation and the development of salivary gland tumours (Batsakis, 1985). Certain occupations have been reported to place people at increased risks for the development of salivary gland carcinomas (Batsakis, 1972). True cysts of the parotid gland account for 2% to 5% of all parotid lesions and are more common in the parotid than in other salivary glands. The neoplasms most frequently associated with cysts are pleomorphic adenoma, adenoid cystic carcinoma, mucoepidermoid carcinoma and Warthin's tumour.

Mucoceles and mucus retention cysts almost invariably involve the minor salivary glands, most commonly on the lips, buccal mucosa, and ventral portion of the tongue. If required, treatment of both is by excision or marsupialisation. A special kind of mucus retention cyst is the ranula of the sublingual gland and the so-called plunging ranula, which extends from the floor of the mouth into the neck. The treatment is excision.

Acute inflammatory conditions generally can be diagnosed by history and physical examination alone. Whereas chronic inflammatory diseases, granulomatous and neoplastic disorders usually require supplemental diagnostic information including laboratory tests, imaging studies or biopsy (Gary, 1991). Investigations used in diagnosing salivary pathology are Plain X-ray, Sialography, Radiosialography, Ultrasonography, Computed tomography, Magnetic resonance imaging, FNAC and Biopsy. The use of plain radiograph in imaging studies of salivary gland swellings is well established. Most submandibular calculi are radio opaque and about 94% can be diagnosed by the plain x-ray taken in intra oral view.

Sialography is currently used to evaluate calculi, obstructive diseases, inflammatory lesions, penetrating trauma and mass lesions. Sialography are reported to be up to 100% effective in detecting ductal and intraglandular calculi. Ultrasonography has also been used to direct needle aspiration of parotid abscesses. It has also been used to localize calculi. As many as 90% of all stones, greater than 2mm in size, can be detected as an echo dense spot on as USG (Eveson, 1985). CT has largely replaced other imaging studies for salivary masses. CT scans delineate solid from cystic masses and can detect masses as small as 1cm within the substance of the salivary glands. CT scan is especially useful in differentiating deep lobe tumours and para pharyngeal masses (Ellis, 1991). Indications for MRI include malignant or recurrent neoplasms, large neoplasms, suspected or known para pharyngeal space involvement, suspected carotid artery involvement or involvement of structures that indicate inoperability.

Direct evidence of facial nerve compression or invasion by tumour can be demonstrated by using MRI. The disadvantage of MRI is that it does not show stone and bone (Bullstrode, 2008; Ellis, 1991; Weissman, 1995; Weissman, 1995). FNAC is a simple and reliable method for obtaining a diagnosis of a salivary gland swelling. The diagnostic accuracy with regard to the benign versus malignancy is about 98% for benign salivary gland swellings, 93% for primary malignant salivary gland swellings, and 88% of metastatic tumours in other studies as compared to 94.72% for benign and 100% for malignant pathology in our study (Table 9). The treatment of salivary gland neoplasms is challenging because of their infrequency, their unpredictable and varied biologic behaviour and their prolonged risk of recurrence. In formulating a treatment a plan for salivary gland malignancies, following factors should be kept in mind that may affect prognosis histopathological diagnosis, size of tumour, lymph node metastases, facial nerve paralysis, skin involvement, pain location (deep or superficial), recurrent tumour, distant metastasis, irradiation and chemotherapy sensitivity.

Surgical resection is the treatment of choice for both benign and malignant salivary gland tumours. Proposed treatment for the benign tumours is conservative parotidectomy which is defined as partial or total removal of the gland with preservation of the facial nerve. If the tumour is malignant and infiltrated to surrounding structures, radical neck excision of the tumours with sacrifice of any portion of facial or lingual nerve is the treatment. Adjuvant radiation therapy is administered is selected malignant salivary gland neoplasms, and chemotherapy may have palliative benefit in uncontrolled malignant neoplasms (Eveson, 1985; Richard, 1994 and Peter *et al.,* 1994). In our study, 86.95% cases of salivary gland tumours were observed in parotid and 13.04% cases were found in submandibular gland. Comparative study was in accordance to Budhraja et al. Tumours of sublingual glands are extremely rare and no cases were recorded because of small number of cases and short study period (Table 10).

Postoperative radiation therapy is indicated when tumour grade is high, surgical margins are close or microscopically positive, recurrent disease, tumour has invaded skin, bone, nerve or extra parotid tissue, regional lymph nodes are confirmed as positive on neck dissection and gross residual or unresectable disease is present. Dose commonly used is 5500 to 6500 CGy, depending on the postsurgical tumour status. In case of adenoid cystic carcinomas, the radiation fields must include the courses of the adjacent cranial nerves because perineural spread is common. There are many reports of long term local control of large inoperable tumours by radiotherapy (Peter, 1994; Tapley, 1977; Norman, 1973). In our study RT given in one case of acinic cell carcinoma. In conclusion salivary gland tumours are treated primarily with surgery and radiotherapy, and there is no established role for induction or adjuvant chemotherapy tumours (Norman, 1973; Das, 1999; Joseph Califano, 1999). When these tumours recur, chemotherapy has been used with some success. In our study no chemotherapy was given. Treatment of common soft tissue tumors of the salivary glands such as haemangioma, lymphangioma, neurofibroma and neurilemmoma is mostly due to cosmetic reasons. If the vital structures are compromised or secondarily infected, treatment is by wide excision (Weissman, 1995).

Conclusion

As acute bacterial and viral infections of the salivary glands, present with a broad spectrum of severity, the morbidity of the bacterial and viral infections depends largely on the medical condition of the patient. Successful management of the salivary gland neoplasms depends on accurate clinical assessment and diagnosis, with appropriate use of fine needle aspiration and CT or MRI imaging. Moreover, knowledge of the particular behaviour of each tumour type guides the development of an appropriate treatment plan for each individual patient. Prognosis is good in benign as well as malignant tumours of salivary glands if treated early; there was no mortality in our study of 35 cases after follow up for 6 months to 2 years.

REFERENCES

Batsakis, J.G., 1972. Basal cell adenoma of the parotid gland. Cancer, 29; 226-230.

Batsakis, J.G., 1985. Myoepitholoma Ann Oto rhino laryngol. 94; 523-524.

Bullstrode, Christopher, k., Norman, S. William, Russell, R.C.G., Bailey and Love's 2008. Short Practice of Surgery 25th Edition, Page No: - 752 - 767

Charle's W. Cummings 2010. "Otolaryngology-Head & Neck surgery". Chapter 84-88; Edn.5th vol.2, Mosby.

Courtney, M Townsend, Daniel Beauchamp, R., Mark Evers, B., Kenneth, L., Mattox. 2004. Sabiston Text Book of Surgery, Elsevier, 17th Edition, Volume 1 Page No; 852-854

Dale, H. 1999. Rice Malignant salivary gland neoplasms: salivary gland diseases". Otolaryngologic Clinics of North America, Vol.32 (5):875-885.

Daniel, G. Deschler, Michael B Rho, 2005. Salivary gland Anatomy "salivary gland disease" surgical and Medical management, Robert L Witt: page No1-15.

Dardic, I, *et al.,* 1982. Histogenesis of salivary gland pleomorphic adenoma with evaluation of the role of the myoepithlial cell. Human pathol.13; 62-75.

Das, S. 1999. "A Practial guide to operative surgery". Chapter-15, 4th Edn. Calcutta, 191-199 pp.

Ellis, G.L, *et al.,* 1991. "Acinic cell adenocarcinoma" Surgical pathology of salivary glands. Chapter 17, Vol.25, 299-314 pp.

Eveson J. W. et al. 1985. "salivary gland tumours: A review of 2410 cases with particular reference to histological types, site, age, and sex distribution". *J Patholo.* 146; 51-58.

Gary R. Warnock, 1991. "Warthin's tumour" surgical pathology of salivary glands.

Joseph Califano, *et al,* 1999. Benign Salivary gland neoplasms. Otolaryngologic Clinics of North America, 32(5):861-873.

McAnnally, T. 1982. "parotitis: clinical presentation and management". Post grad med, 71; 87-99.

Norman, E Hugo, Peter Mc. Kinney, B Herold Griffth. 1973. Surg Clinic of North 1America, (53): 105 –111

Peter, J. 1994. Morries and Ronald A. Malt oxford, 2 sections 30-48, 1994: 2220-2226.pp.

Radd, II *et al.,* 1990. "Acute bacterial sialadenitis: A study of 29 cases and review". Rev Infect Dis, 12; 591-601.

Richard, L. Fabian, 1994. "Salivary glands". Oxford Text book of Surgery, vol.2, Edt.

Tapley, N.D. 1977. "Irradiation treatment of malignant tumours of the salivary glands". Ear Nose Throat J, 56; 110.

Weissman, J.L 1995. "Imaging of salivary glands" Semin Ultrasound CTMR, 16; 546-568: 1995.

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