



Original Research Article

Salivary Gland Lesions In Erbil: A Clinicopathological Study With Particular Reference To Gender, Age of Patients, and Site

Layla Muhammad* Saman Salah Al-Deen Abdulla
College of Dentistry, Hawler Medical University, Erbil, IRAQ

*E-mail:dr.layla_horamy@yahoo.com

Accepted 28 May, 2017

Abstract

This is a retrospective study; 204 cases of salivary glands were collected from the archives of the histopathology departments of Rizgary Teaching Hospital and private laboratories in Erbil, Kurdistan region of Iraq in the period between 2010 and 2015. Data to be analyzed included sex, age of the patients, exact histological diagnosis and anatomical location as documented in the histopathology report. The pathologies were classified into inflammatory, benign and malignant neoplasms. 116 of 204 cases (56.86%) were males and 88 (43.14%) were females with (M: F ratio 1.32:1). The age range was 9-75 years; the mean age was 38.03 years. Peak incidence for neoplastic lesions was within the age group (21-30) years for both sexes, while for inflammatory lesion the mean age was under 20. Inflammatory lesions represented 19.60% of cases and the rest (80.39%) were neoplastic, of which 69.60% were benign and 10.78% were malignant. The commonest benign neoplasm was pleomorphic adenoma and Adenoid cystic carcinoma was the commonest malignant tumor, the most common site was the parotid gland (75% of malignant cases).

Key Words: Salivary gland lesions, benign tumors, malignant tumors, pleomorphic adenoma, adenoid Cystic Carcinoma.

آفات الغدد اللعابية في أربيل: دراسة طبية مع إشارة خاصة إلى الجنس، عمر المرضى، وموقع الغدد

الخلاصة

هذه دراسة بأثر رجعي. تم فيها جمع ٢٠٤ خزعة نسيجية من الغدد اللعابية من أرفيف أقسام التشريح المرضي في مستشفى رزكري التعليمي والمختبرات الخاصة في أربيل، إقليم كردستان العراق من عام ٢٠١٠ - ٢٠١٥. وتشمل البيانات التي تم تحليلها الجنس والعمر للمرضى والتشخيص النسيجي الدقيق والمكان التشريحي للغدد كما هو موثق في تقرير التشريح المرضي. تم تصنيف الأمراض إلى الحالات الالتهابية، الأورام الحميدة والأورام الخبيثة وقد أظهرت النتائج أن عدد المرضى من الذكور يفوق عدد الإناث بنسبة (١,٣٢:١) تركزت الإصابات الالتهابية في عمر العشرين أو دون العشرين عاما وللأورام الحميدة والخبيثة ضمن الفئة العمرية (٢١-٣٠) عاما وكانت الآفات الالتهابية ١٩,٦٠% من الحالات والباقي (٨٠,٣٩%) من الأورام، ٦٩,٦٠% حميدة و ١٠,٧٨% خبيثة وكانت الغدة الأكثر إصابة لجميع الآفات المرضية هي الغدة النكفية تم تحليل ومقارنة النتائج مع نتائج دراسات أخرى أجريت على أمراض الغدد اللعابية في العراق وفي بلدان أخرى عربية واجنبية. وكان الاستنتاج ان حالات الأورام للغدة اللعابية ليست شائعة ولكنها أكثر من الإصابات الالتهابية وكانت الغدة اللعابية الرئيسية أكثر من الغدد الطفيفة إصابة بالأورام وبشكل خاص الغدة النكفية، الورم الحميد متعدد الأشكال والسرطان الكيسي الغداني كانت الأورام الحميدة والخبيثة الأكثر شيوعا، على التوالي.

الكلمات المفتاحية: آفات الغدة اللعابية، الأورام الحميدة، الأورام الخبيثة، ورم غديم تعدد الأشكال، سرطان الغدة الكيسية.

Introduction

Salivary glands are exocrine organs comprises of ducto-acinar units that produce and secrete saliva [1]. The histopathology of the salivary glands and particularly of salivary gland tumors is complex and may be problematic even for the most experienced diagnostic pathologist [2].

In addition to neoplasia, salivary glands can be affected by a range of non-neoplastic conditions. Sialadenitis [3] is inflammation of the salivary glands which may be acute or chronic.[4] Infections agents involving the salivary glands could be viral or bacterial (or rarely fungal). Mumps is the commonest salivary gland viral infection; however due to immunization, its incidence has decreased. Mumps causes swelling of the parotid glands, but other major salivary glands may also be affected in about 10% of patients [5]. In debilitated dehydrated patients, acute bacterial infection of the major salivary glands occur. Prior to era of antibiotics and intravenous fluid rehydration, bacterial parotitis was often a pre-terminal event [6]. Chronic bacterial infection can occur in the setting of previous gland destruction by stones, irradiation or autoimmune disease [7]. Sialadenosis (sialosis) is an uncommon, non-inflammatory, non-neoplastic condition characterized by recurrent swelling of the gland. The cause is hypothesized to be abnormalities of neurosecretory control, and may be associated with alcoholism.⁶. Sjogren's syndrome is a chronic autoimmune disease of salivary glands. It preferentially affects the parotid gland, but the submandibular and minor salivary glands may also be affected. In addition, the lacrimal glands can also be affected. While Sjogren's syndrome can be primary, commonly it is accompanied by other systemic diseases, such as rheumatoid arthritis, systemic lupus erythematosus or primary biliary sclerosis [8]. Mucocele is seventeenth most common salivary gland

lesion seen in the oral cavity[9]. Extravasation mucocele results from trauma to salivary glands duct and the consequent spillage into the peri-glandular soft tissue. Retention mucocele on the other hand, is due to a reduction or absence of glandular secretion produced by blockage of the salivary gland ducts [10].

Salivary gland neoplasms are generally rare, and they account for 2-6.5% of all head and neck tumors [11]. However, despite the low frequency they are clinically important due to their cofounding histological and behavioral diversity in addition to their proximity to important head and neck structures which potentially complicate their management [12]. In addition, salivary gland tumors are the second most common neoplasm in the mouth with a widely variable histologic characteristics, which make it difficult to determine its pathogenesis [13]. Malignant salivary gland neoplasms are divided into luminal (arising in acinar and ductal cells) and abluminal (arising in myoepithelial and basal cells) types. Different proportions of these cell types results in a wide variety of histologically patterns. When the myoepithelial elements predominates the neoplasm is considered to be biologically low-grade and when the myoepithelium is absent, the lesion is considered high-grade [14]. The diversity of salivary gland tumors lead to disagreements over histological nomenclature which were resolved in 1971 by the World Health Organization (WHO) histological classification system, revised in 1999 and 2005 [15].

The objective of this study is to investigate the clinicopathological parameters of salivary gland lesions in Erbil, Kurdistan region of Iraq and compare it to other similar studies.

Materials and Methods

The materials used in this study consisted of (204) formalin fixed paraffin-embedded biopsy specimens of salivary gland retrieved from the archives of Rizgary teaching

hospital (Ministry of Health, Kurdistan region of Iraq) and private histopathology laboratories in Erbil cityin between January/2010 and December/2015. Data including (age, sex, and lesion site and type) were obtained from laboratory records derived from information provided in histopathology request forms. For all cases, the slides were collected and reviewed and classified according to the World Health Organization (WHO) histological typing for salivary tumors.

Statistical Analysis: Collected data were analyzed by using Chi square. All statistical calculations were done using SPSS (Statistical Package for the Social Science; SPSS Inc., version 17). A P value less than or equal to 0.05 was considered statistically significant.

Results

Out of the 204 cases included in this study 116(56.86%) were males and 88(43.14%) were females with (M: F ratio 1.32:1). The age range was 9-75 years, the overall mean age was 38.03 years. The pathologies were classified into inflammatory and neoplastic, see table 4 & table 5.

***Inflammatory lesions** represented 19.60% of the cases, 60 % of which were male and 40% were female. The age range was 9-60 years with mean age of 30.8years. The peak incidence for inflammatory lesion was in patients under the age of 20 years for both males and females with mean age of 23.8 years, (m: f ratio 1.5:1), this is summarized in Table-1. The most common location were the sublingual & minor salivary glands (57.5%) followed by the parotid gland 25%. The most common inflammatory lesion was mucocele (50%) and all of them involved the lower lip.

Table 1: Distribution of salivary gland inflammatory lesions according to gender and age groups

Age (years)	Inflammatory		
	males	females	Totals
≤ 20	12	3	15(37.5 %)
21 -30	3	2	5(12.5%)
31 – 40	2	1	3(7.5%)
41 – 50	4	6	10(25 %)
51 – 60	3	3	6(15%)
≥ 61	0	1	1(2.5%)
Total	24	16	40(100%)

*

Benign neoplasms presented 69.60% of the cases, 54.9% of them were males and 45.1% were females. The age range was 9-70 years and the mean age was 54.6 years. The peak incidence for benign neoplasms was within the age group (21-30) years for both sexes.

The most common anatomical site was the parotid gland (58.45%) followed by

submandibular gland (24.65%). The most common benign neoplasm was pleomorphic adenoma which made (83.54%) of all neoplasms and (96.48%) of benign neoplasms. 78 cases developed in the parotid, 35 cases in the submandibular and 24 cases in the sublingual and minor salivary glands, these are shown in Table-2.

Table 2: Distribution of benign salivary gland tumors according to anatomical location

Benign tumors	Parotid	Submandibular	Sublingual And minor salivary glands	Total
Pleomorphic adenoma	78	35	24	137(96.48)
Warthin tumor	4	/	/	4(2.82)
clear cell adenoma	1	/	/	1(0.70)
Total	83	35	24	142(100%)

*Malignant neoplasms represented 10.78% of total lesions, 63.6% of the cases were male while 36.4% were female. The age range was 12-75 years with mean age of 36.68 year. The peak incidence for malignant tumors was within the age group (21-30) years for both sexes.

The most common location was the parotid gland (68.18%) followed by the sublingual and minor salivary glands (27.27%), the commonest malignant tumors was adenoid cystic carcinoma (54.55%), of which 9 cases developed in the parotid gland and 3 cases in the sublingual and minor salivary glands, these are shown in table-3.

Table 3: Distribution of malignant tumors according to site

Malignant tumors	Parotid gland	Submandibular gland	Sublingual & minor salivary glands	Total
Adenoid cystic carcinoma	9	\	3	12(54.55%)
Mucoepidermoid carcinoma	4	\	3	7(31.81%)
Large duct adeno-carcinoma	1			1(4.55%)
Malignant mixed cell tumour	1	1		2(9.09%)
Total	15	1	6	22(100%)

Table 4: Distribution of salivary gland lesions according to site

Site	Inflammatory No (%)	Benign No (%)	Malignant No (%)	Total No (%)
Parotid	10(9.26)	83(76.85)	15(13.89)	108(52.94)
Submandibular	7(12.28)	35(81.40)	1(2.33)	43(21.08)
Sublingual & minor salivary	23(43.40)	24(45.28)	6(11.32)	53(25.98)
Total	40	142	22	204(100%)

$P < 0.0001$ (So there is a strong statistical relationship between the type of salivary gland lesions and the site of those lesions).

Table 5: Distribution and percentage of salivary gland neoplasms according to gender and age groups.

Age (years)	Benign			Malignant		
	males	females	Total	males	females	Total
≤ 20	11	9	20(14.08%)	0	1	1(4.54%)
21-30	14	19	33(23.24%)	1	4	5(22.73%)
31-40	13	18	31(21.83%)	1	1	2(9.09%)
41-50	9	12	21(14.79%)	1	1	2(9.09%)
51-60	14	5	19(13.38%)	5	0	5(22.73%)
≥ 61	17	1	18(12.68%)	6	1	7(31.82%)
Total	78	64	142(100)	14	8	22(100%)

Discussion

The sample used in this study consisted of 204 cases. 116(56.86%) were males and 88(43.14%) were females with (M: F ratio 1.32:1). The age range in our study was between 9 and 75 years, the mean age was 38.03 years. These findings are consistent with Ali Zeki Naji study [16] from Babil in which (M: F ratio was 1.4:1), the age range was 19-72 years and the mean age was 40 years, while Artur Cunha et al [17] study reported a mean age of 46.47 years. In addition, our finding is also comparable with

figures from Basra, Mosul and Baghdad, [18- 20]

In this study, inflammatory lesions represented 19.60% of all cases with a peak incidence of under 20 years for both sexes, the most common sites were sublingual & minor salivary glands (43.4%), while in Ali Zeki Naji [16] study, inflammatory lesions made (38.2%) of all cases and the peak incidence was the third decade of life and the most common site of salivary gland lesion was the submandibular gland (70%). In our study the most common inflammatory

lesion was mucocele and most of the patients (65%) were under 20 years of age. Oral mucocele was more common in male with M: F ratio of 1.5:1. Our findings simulated the findings of Yamasoba et al [21] and Oliveira et al [22] who reported that more than 65% of their patients with oral mucocele were under 20 years of age and male more effected with M:F ratio of 1.07:1. The most common site for oral mucocele in our study was the lower lip, the same finding was reported in Chandramani et al [23] study.

In our study (61.8%) of cases were neoplastic with M: F ratio of 1.27:1, this findings is consistent with Yusuf et al, 2013[24]in which salivary gland tumors were more common in men and the M: F ratio was 1.23:1 However other studies performed in Brazilian population, found that salivary gland tumors were more common in females with a M:F ratio of 0.8:1 [25]. In addition, in Faris Al-Khiro [26] study the incidence was higher in females than males for most of salivary gland tumor types.

In our study the peak incidence for benign and malignant tumors was within the age group (21-30) years for both sexes while in Ali ZekiNaji[16] study, benign lesions were mostly seen in the third decade of life, andmalignant tumors mostly seen in those above 61 years. On the other hand, in Faris Al-Khiro [26] study the peak incidence for benign tumors was in the sixth decade and for malignant tumors in the seventh decade for both sexes.

In our study, benign salivary gland tumor comprised (69.60%) of all salivary tumors and predominated in major glands. Similar results were reported by other authors in Iran [27], Jordan [28], and Yusuf et al [24] studies in which benign tumors represented (68.4%), (70%), and (70.2%) respectively. In Ali Zeki Naji [16], Faris Al-Khiro [26] studies however, benign tumors comprised (83.33%), (82.5%), of cases respectively.

In this study, pleomorphic adenoma (PA) was the most common neoplasm (83.54%) and made (96.48%) of the benign tumors, and most occurred in the parotid gland (56.9%). These findings are in agreement with Artur Cunha et al [17] and Iran [27], studies in which PA compromised (81.2%), (85%) of all salivary gland neoplasms respectively and most of them were in the parotid gland, while in Yusuf et al, 2013[24] study, PA constituted (45.3 %) of all salivary gland tumors and (64.5 %) of benign tumors, and the majority of cases were in the parotid gland. Also in Ali Zeki Naji [16], Faris Al-Khiro [26] and Al-Khateeb et al [28], studies PA compromised (64.2%), (59.7%), (54%), of all salivary gland neoplasms respectively, most of them were in the parotid gland.

In this study only (16.66%) of the neoplastic cases were malignant, the benign malignant ratio was 6.5:1, the same result was documented in a study in Baghdad [20], while malignant tumors had a higher percentage in Basrah (29%) and Mosul (27.6%) studies [18, 19]. In Faris Al-Khiro, [26] study, malignant cases made (17.5 %)of the cases, while Yusuf et al, 2013[24] classified (29.8 %) of cases as malignant with a benign malignant ratio of 5:1. The benign malignant ratio in other studies were 5:1 in Ali Zeki Naji [16], 4:1 in Brazil[17], 3.16:1 in turkey [29], 2.33:1 in Jordan [30], 1.6:1 and 1.34:1 in China [31]. While in Fonseca et al [25]. (74.8%) of cases were benign and (25.1%) were malignant, the benign malignant ratio was 2.9:1 [25].

In our study, adenoid cystic carcinoma (ACC) was the most common malignant neoplasm (54.55%) of all the malignant cases, similar results were reported by Artur Cunha et al [17] study in which ACC compromised (58.3%). of malignant cases, our results are also consistent with those reported by Yusuf et al [24], Basra and Mosel [18, 19]. Chidzonga et al[32] from Zimbabwe, Al-Khateeb et al [28],and Iran

[27] studies, in which ACC) was the most common malignant neoplasm.

ACC with a slight male predilection had a mean age of 49.9, while Sur et al [33] in South –Africa reported a mean age of 52 years and an equal male: female occurrence. Other studies on the other hand from Brazil [17], Jordan [30] and Mexico [34] all reported a female preponderance.

As for the exact anatomical location, our study showed that 75% of ACC cases involved the parotid gland. However, Faris Al-Khiro [26], Artur Cunha et al [17], Ali Zeki Naji [16], studies reported that ACC were more common in the minor salivary glands and more interestingly, Otoh et al [35] reported 100% of ACC cases to occur in the palate, a finding in stark contrast to those documented by Al-Khateeb et al [28] who found that only 25% of ACC occurs in the palate.

Conclusion

Neoplastic salivary gland lesions are much more common than non-neoplastic lesions. Mucocele is the commonest inflammatory lesion typically occurring in the lower lip. Pleomorphic adenoma is the commonest neoplasm. Major salivary glands were more affected than minor glands by neoplastic processes mostly the parotid gland, pleomorphic adenoma and adenoid cystic carcinoma were the most frequent benign and malignant tumors respectively. While most inflammatory lesions were more common the under 20s, the neoplastic lesions has no for predilection age and the older age groups neoplastic lesions are more common in males.

References

1. Strick M J, Kelly C, Soames J V, McLean N R. Malignant tumors of the minor salivary glands—a 20 year review. *Br J Plast Surg*. 2004; 57:624–631
2. Speight PM, Barrett AW. Salivary gland tumours. *Oral Diseases*. 2002; 8:229–40.

3. Barnes L, Eveson JW, Reichart P, Sidransky D. Tumours of the salivary glands. In: Barnes L, Eveson JW, Reichart P, Sidransky D, editors. *World Health Organization classification of tumors. Pathology and genetics of head and neck tumors*. Lyon: IARC Press; 2005. p. 209-81
4. Hviid A, Rubin S, Muhlemann K; Mumps. *Lancet*. 2008 Mar 15;371(9616):932-44.
5. Syebele K, Butow KW; Oral mucoceles and ranulas may be part of initial manifestations of HIV AIDS *Res Hum Retroviruses*. 2010;26(10):1075-8.
6. Jump up Pape, SA; MacLeod, RI; McLean, NR; Soames, JV (1995). Sialadenosis of the salivary glands. *British J plastic surg.*, 48 (6): 419–22.
7. Tauro LF, George C, Kamath A, et al; Primary tuberculosis of submandibular salivary gland. *J Glob Infect Dis*. 2011;3(1):82-5.
8. Von Bultzingslowen I, Sollecito TP, Fox PC, et al; Salivary dysfunction associated with systemic diseases: systematic review and *Oral Surg Oral Med Oral Pathol Oral RadiolEndod*. 2007;103 Suppl:S57.e1-15.
9. Sunil Kumar Y, et al. Role of Fine needle aspiration cytology in salivary gland tumors in correlation with their histopathology: A two year prospective study. *J clin diagn Res*, 2011; 5(7): 1375-1380.
10. Flaitz CM, Hicks JM (2006). Mucocele and ranula. *eMedicine*. Retrieved 19 October from <http://www.emedicine.com/derm/topic648.htm>
11. Boneu BF, Vidal HE, Maizcurrana TA, Gonzalez LJ. Submaxillary gland mucocele: presentation of a case. *Med Oral Patol Oral Cir Bucal* 2005;10:180-
12. Speight PM, Barret AW. Salivary gland tumors. *Oral disease*, 2002; 8: 229-40.
13. Atarbashi S, Elahi M, Khani M, Rakhshan. Immunohistochemical analysis of B-cell lymphoma-2 in pleomorphic adenoma and mucoepidermoid carcinoma. *Dent Res J (Isfahan)*; 2014.11(2): 257–6
- 14- Gaurav Goyal, MBBS, Syed A. Mehdi, MD, and Apar Kishor Ganti, MD, *MSONcology Journal, Cancer*. October 15, 2015, 29(10):773-780

15. Lawal AO, et al. A review of 413 salivary gland tumours in the head and neck region. *J ClinExp Dent.* 2013; 5(5): E 218–22. doi: 10.4317/jced.51143
- 16-Ali Zeki Najji, Salivary gland lesions in Babil: clinicopathological study. *Medical Journal of Babylon* 2012 -Vol. 9- No. 2.
17. Artur Cunha VASCONCELOS , Felipe NÖR , Luise MEURER, Gabriela SALVADORI, Lélia Batista de SOUZA, Pablo Agustin VARGAS , Manoela Domingues MARTINS, Clinicopathological analysis of salivary gland tumors over a 15-year period.*Braz. oral res.* vol.30 no.1 São Paulo 201621.
18. GhaydriaH.Badri, Sudad A. Al-Nakshabandi, Mohammaed K. AL- Wisasy. Salivary gland neoplasm: analysis of 89 cases from Basra. *Mjbu* , 2004; 22(192): 12-14.
19. Ahmed ST. Salivary neoplasms (Analysis of 108 cases from Mosul). *Iraq med J* 2002, 51:27 – 30.20. 20-Alash NI, Al-Saleem T. Tumors of the minor and major salivary glands (analysis of 225 cases). *J Fac Med Baghdad* 1987; 29:103 – 10914. 13.
21. Yamasoba T, Tayama N, Syoji M, Fukuta M. Clinicostatistical study of lower lip mucoceles. *Head Neck.* 1990;12:316–20
22. Oliveira DT, Consolaro A, Freitas FJ. Histopathological spectrum of 112 cases of mucocele. *Braz Dent J.* 1993;4:29–36
23. Chandramani B More, Khushbu Bhavsar, Saurabh Varma, and Mansi Tailor1. *J Oral Maxillofac Pathol.* 2014 Sep; 18 (Suppl 1): S72–S7
24. Yusuf Kızıl, corresponding author UtkuAydil, ÖzgürEkinci, AlperDilci, Ahmet Köybaşıoğlu, Mehmet Düzlü, and Erdoğanİnal: Salivary Gland Tumors in Turkey: Demographic Features and Histopathological Distribution of 510 Patients *Indian J Otolaryngol Head Neck Surg.* 2013; 65 (Suppl 1): 112–120.
25. Fonseca FP, de Vasconcelos Carvalho M, de Almeida OP, Rangel AL, Takizawa MC, Bueno AG, Vargas PA. Clinicopathologic analysis of 493 cases of salivary gland tumors in a Southern Brazilian population. *Oral Surg Oral Med Oral Pathol Oral Radiol.*2012; 114:230239.
26. Farisl Al-Khiro, Salivary gland tumors: A review of 171 cases, with Particular reference to histological types, site, age and gender distribution. *J Bagh Coll Dentistry* 2014; 26(1):88-91)
27. Mahmoud Shishegar, Mohamad J. Ashraf, Negar Azarpira, BijanKhademi, Basir Hashemi, and Amir Ashrafi, Salivary Gland Tumors in Maxillofacial Region: A Retrospective Study of 130 Cases in a Southern Iranian Population. *Pathology Research International surgery Volume 011* (2011), Article ID 934350, 5 pages.
28. AlKhateeb TH, Ababneh KT. Salivary tumors in north Jordanians: a descriptive study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007; 103(5):e53-59. 2016.
- 29-M. İsa Kara , Fahrettin Göze , Şeref Ezirganl, et al Neoplasms of the salivary glands in a Turkish adult population *Gaziantep University Faculty of Dentistry.* 2010: 270-274.
- 30-Ma'aitha JK, Al-KaisiN, Al – Tamimi S, Salivary gland tumors in Jordan: a retrospective study of 221 patients. *Croat Med J.* 1999; 40(4): 539-42.
- 31-Li LJ, Li Y, Wen YM, Liu H, Zhao HW. Clinical analysis of salivary gland tumor cases in West China in past 50 years. *Oral Oncology.* 2008; 44:187-92.
32. Chidzonga MM, Lopez Perez VM, Portilla-Alvarez AL. Salivary gland tumours in Zimbabwe: report of 282 cases. *Int J Oral Maxillofac Surg.* 1995; 24(4):293-297.
33. Sur RK, Donde B, Levin V et al. Adenoid cystic carcinoma of salivary glands: a review of 10 years. *Laryngoscope.* 1997; 107(9): 1276-1280.
- 34..Ledesma-Montes C, Garcés-Ortíz M. Malignant salivary gland tumors. *Rev Inst Nal Cancerol (Mex).* 2000; 46(3): 167-170.
35. Otoh EC, Johnson NW, Olasoji H, Danfillo IS, Adeleke OA. Salivary gland neoplasms in Maiduguri, north-eastern Nigeria. *Oral Dis.* 2005; 11:386-91