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Salivary Gland Obstruction and its Distribution in Iraqi Population

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Abstract: ***Background:*** *saliva is the mixed glandular secretion which constantly bathes the teeth and the oral mucosa. It is constituted by the secretionsof the three paired major salivary glands; the parotid, submandibular and sublingual. It also contains the secretions of the minorsalivary glands, Sialolithiasis is the most common disease of salivary glands and is characterized by obstruction of salivary secretion by calculation inside the duct or even in the glandular parenchyma.* ***Aim of study:*** *This study aimed to investigate the age,sex,and the distribution of salivary gland obstruction especially stone,ranula and mucocele in Iraqi population.* ***Materials and method:*** *A total of 42 cases with salivary gland obstruction was collected from two major teaching and referral hospital in Baghdad ''Medical city hospital of surgical specialties'' and'' AL-Kinidy hospital ''maxillofacial department from 2015-2019.* ***Results:*** *The study population comprised of 42 cases of salivary gland obstruction. The age distribution was from (5-70) years with average of 30 years. The females were 16 cases (38%) and the males were 26 cases (62%).* ***Conclusion:*** *Salivary calculi are a common cause of salivary gland disorder and may occur in any of the salivary glands and at almost any age. Success is measured by treatment that is efficient, clinically effective, cost effective, and gland sparing.*

Keywords: Sialolithiasis, mucocele, ranula

1. Introduction

The salivary glands are exocrine glands, glands with ducts, that produce saliva. They also secrete amylase, an enzyme that breaks down starch into maltose. These glands produce saliva, which functions as a lubricant for speech and swallowing, assists taste, has antibacterial and immunologicproperties and contains digestive enzymes [1].

1.1 Classification of salivary gland diseases

1) Developmental.
2) Obstructive conditions
   a) Sialolithiasis (Salivary Stones)
   b) Mucocele- Ranula
3) Infectious conditions (Acute & chronic Sialadenitis)
4) Conditions associated with immune defect (Benign Lymphoepithelial lesion)
5) Salivary gland tumors (benign and malignant) this paper will study the salivary gland obstruction and its distribution.

1.2 Obstructive Salivary Gland Disease

Salivary gland stones (sialolithiasis)
The chemicals in saliva can sometimes crystallize into a stone that can then block the salivary gland duct. The reason why a stone forms is not known. Most salivary stones are mainly made of calcium. However, there is no abnormality of the blood calcium level or any other problem with calcium in the body. The size of the stone can vary from less than 1 mm to a few centimeters in diameter [2]. The diagnosis can be made clinically and confirmed radiographically by plain films, ultrasound, Sialography, or sialo-endoscopy [3].

Mucocele
Salivary ducts, especially those of the minor salivary glands, are occasionally traumatized, commonly by lip biting, and severed beneath the surface mucosa. Subsequent saliva production may then extravasate beneath the surface mucosa into the soft tissues. Over time, secretions accumulate within the tissues and produce a pseudocyst (without a true epithelial lining) that contains thick, viscous saliva. These lesions are most common in the mucosa of the lower lip and are known as mucocele [4].

Ranula
The most common lesion of the sublingual gland is the ranula, which may be considered a mucocele of the sublingual salivary gland. Ranulas result from mucous retention in the sublingual gland ductal system or mucous extravasation as a result of ductal disruption. Ranulas may reach a larger size than mucoceles because their overlying mucosa is thicker and because trauma that would cause their rupture is less likely in the floor of the mouth [4].

2. Materials and method

A retrospective study analysis of 42 cases with salivary gland obstruction was collected from two major teaching and referral hospital in Baghdad "Medical city hospital of surgical specialties"and" AL-Kinidy hospital "maxillofacial department from 2015-2019.The collected data obtained from outpatient clinic, surgical ward and operative theater of maxillofacial department and a questionnaire form utilized according to age, gender, the salivary gland involved and the side of that gland, and surgical approach. All information about the cases were obtained from patient file, case sheet, operative notes with pictures taken preoperative and postoperative for few cases.

3. Results

The study population comprised of 42 cases of salivary gland obstruction. The age distribution was from (5-70) years with average of 30 years. The females were 16 cases (38%) and the males were 26 cases (62%). The sialoliths comprised 22 cases (52% of the salivary gland obstruction) with age distributionfrom 10-70 year with average of 36 years. The females were 7cases (32%)and males were 15(68%) and the majority of cases was submandibular gland 16 cases (72%) followed by the sublingual gland 5 cases (22%)and the parotid gland form (6%).The presence of stone was similar on both side and the surgical approach was applied by removal of stone in 11 case and the removal of gland in 11 case.

Table 1: Sialolithiasis according to age group

Age group	Males	females	Total
10-20	2	1	3
20-30	1	3	4
30-40	5	2	7
40-50	5	1	6
50-70	2	0	2
Total	15	7	22

Mucocele comprised 18 cases (42% of salivary gland obstruction with age distribution from (14-40) years with average of 25 years. The females were 7 (38%) cases and the males were 11(62%) cases and all the cases were present in the lower lip (15 cases were in the right side and 3 cases on the left). The only surgical approach was excision of the minor salivary gland. While ranula rarely appear and present with 2 cases only (4% of salivary gland obstruction). Both cases were females and their age were 5 and 8 years old. The surgical approach was marsupialization of the ranula.

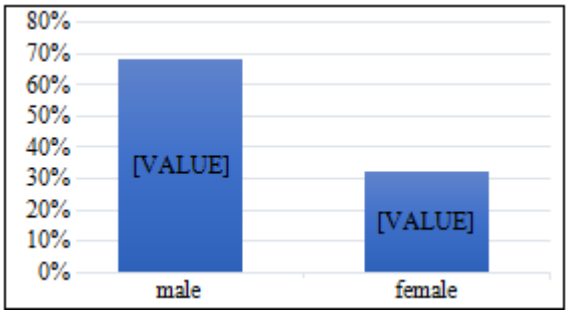

Figure1: Percentage of stones according to gender

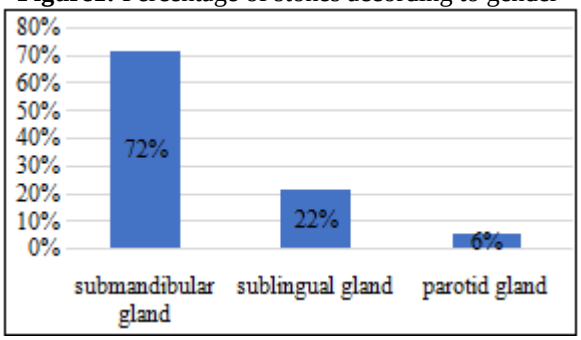

Figure 2: Percentage of stone according to the gland

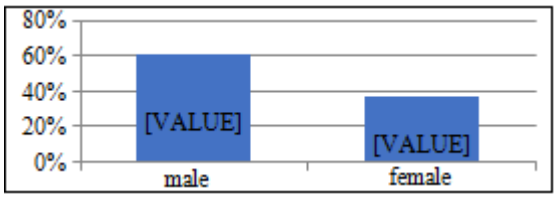

Figure3: Percentage of mucocele according to gender

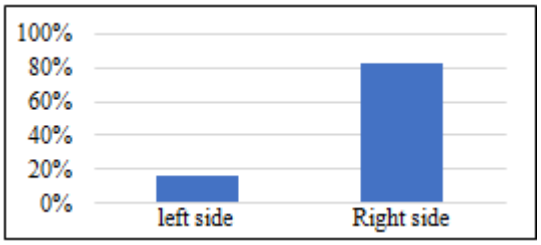

Figure4: Percentage of Mucocele according to the side

4. Discussion

Salivary gland diseases are relatively common. The most frequent non-neoplastic salivary disorder is obstructive sialadenitis, which may be due to calculi, fibro mucinous plugs, duct stenosis, foreign bodies, anatomic variations, or malformations of the duct system leading to a mechanical obstruction associated with stasis.Sialolithiasis is the main cause of obstructive salivary diseases [5] being involved in 52% of cases and it is more frequent in male patientswith percentage (68%), it is uncommon in children [6][7] as only 9% of all sialolithiasis cases occur inour population.

Sialolithiasis affects the submandibular gland in 72% of cases, mainly unilaterally but without a preferred side which agree with *(Stimetic Bet al 2006)* [8] which was partly explained by post-mortem morphometric studies which found a symmetry between the right and left gland. About 4% of cases occur in the parotid gland. The striking difference between parotid and submandibular stones is partially related to several anatomic factors, Wharton's duct is the longest salivary duct; therefore, saliva has a greater distance to travel before being emptied into the oral cavity. In addition, the duct of the submandibular gland has two sharp curves in its course: The first occurs at the posterior border of the mylohyoid muscle, and the second is near the ductal opening in the anterior floor of the mouth. Finally, the punctum of the submandibular duct is smaller than the opening of Stensen's duct also the type of submandibular gland secretion (mainly mucous),these features contribute to a slowed salivary flow and provide potential areas of stasis of salivary flow, or obstruction, which is not found in the parotid or sublingual ductal systems[9]. Sialolithiasis still represents the most frequent reason for submandibular gland resection.
The sublingual and other minor salivary glands are unexpectedly affected 22% of cases.In (*Bodner L 1993)* [10]study the sublingual gland is rarely affected (about 0-5% of cases).

Mucocele is a common lesion of the oral mucosa that results from an alteration of minor salivary glands due to a mucous accumulation. Mucocele involves mucin accumulation causing

limited swelling. The lower lip is the most common site as it is the most probable place for a trauma. It affected males more than females in this study unlike other studieswhich found that there is no difference between genders.

By definition ranula is defined as a mucus filled cavity in relation to sublingual gland present in the floor of mouth. The name "ranula" has been derived from the Latin word “rana” which means "frog". Ranula usually occurs in children and young adults.

5. Conclusion

Salivary calculi are a common cause of salivary gland disorder. Itaffects male more than female and may occur in any of the salivary glands mostly the submandibular gland. It may occur at any age mainly during the third and fourth decade of life and rarely in children. The stones may be small and intraductal or lie within the gland substance when they may become very large. They cause symptoms by obstructing salivary flow. Sialography is an important tool for the assessment of salivary gland obstruction in patients presenting with sialadenitis.Treatment were either by stone excision or gland excision. Success is measured by treatment that is efficient, clinically effective, cost effective, and gland sparing.

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