

Case Report

Anatomical variation of submandibular gland duct

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Abstract: The submandibular gland is one of the three mayor salivary glands, in which his excretory duct is called Wharton's duct, which empties into the caruncles, on the floor of the mouth. In this case annex vivo finding in cadaveric male, black race, who is in the amphitheater of the Faculty of Medicine of Universidad de Cartagena, in which during the face dissection it was discovered that the excretory duct of the right submandibular gland, changes the path and localization of the duct and anastomoses with the excretory duct of the parotid gland duct, also called is Stenon duct, leading to the buccal mucosa adjacent to the second molar; Wharton's duct on the left is in its normal travel position. Very few cases with this finding are reported, therefore is of great importance to science and health professionals.

Keywords: Submandibular gland, parotid gland, anatomical variation

INTRODUCTION

The submandibular gland is a salivary major gland located in both sides of the face, in the pit of the sub maxillary region, at the same level of the body of the jaw [1]. This gland posses acini that are composed of either mucous or serous cells, but with major predominance in the human being of serous secretion [2]. It weights from 7 to 8 gr and its surrounded by its own capsule to separate it from other organs [2]. It is divided in a lateral face, medial face, inferior border and anterior, top and posterior prolongation [3].

The submandibular gland posses an excretory duct named the Wharton duct, whose diameter is of 2 to 3 mm, and its main function is to conduct the saliva to the oral cavity [4]. This excretory duct has a travel pathway of 4 or 5 cm long, in which emerges from the medial part of the medial face of the gland, crossing inward the space between the hyoglossus muscle medially, and the mylohioid muscle laterally to end in the vertex of the salivary caruncles [5], which are located in the floor of the mouth, to the sides of the lingual frenum, through the perforation of the mucous on both sides [3, 4]. Nevertheless, in some occasions they present a few slightly common variations in the evacuation channels of the glands; therefore, the present case describes an unusual variation of the path of Wharton's duct.

ANATOMICAL VARIATION DESCRIPTION

Corpse of masculine sex of 45 years old and black race, to whom in finding postmortem it was found anatomical variation in the right submandibular gland. In the room of dissection of the amphitheater of the Faculty of Medicine of the University of Cartagena there is received corpse donated by the office of Legal Medicine of Cartagena - Colombia. To the moment of the dissection in face it is found a variation in the disposition and location of the excretory duct of the right submandibular gland. The finding consists of the external location of the excretory duct of the right submandibular gland that crosses and finishes in Stenon's duct of the right Parotid gland (See Fig.1). The excretory duct of the left submandibular gland appeared normally, with the suitable tour ending in the caruncles, in the floor of the mouth. (See Fig.2).



Fig 1: It can be seen the variation of the submandibular gland duct (yellow) joining to the parotid gland duct in the right region, the facial vein (blue) and facial artery (red).



Fig 2: It can be seen that the left parotid gland duct path is normal, without the presence of any variation (yellow), the facial vein (blue) and facial artery (red).

DISCUSSION

Nowadays, as researchers keep developing new organs or tissues it is possible that one of them produces an anatomical variation, either concerned to the form, the place where it is located or where it ends [6]. In this case, it is found a variation of the submandibular gland duct in the right region, where instead of the duct ending in the caruncles located in the floor of the mouth, is diverted in the path to join the excretory duct of the parotid gland. This variations can produce several alterations such as an obstruction in the Wharton's duct as Koybasioglu *et al.*; found in 2000 due to an accessory duct of the Submandibular gland [7], also can happen that several things may be inside the duct and could cause new problems such as a tooth found by Gupta *et al.*; in 2011 in submandibular gland duct [8] or can produce most commonly sialolithiasis, in which the clinical symptoms are swelling of the salivary gland, and pain [9].

It is very important to report these finding so further studies can be initiated regarding to alterations that may cause such variations, such as an anomaly or condition either by the submandibular gland because of a decrease in salivary flow, or in the parotid gland by an excess of salivary flow, Therefore, in this case it was observed a variation in the travel of the right portion of the Wharton's duct, which doesn't end in the caruncles because the duct joins and anastomoses with the excretory duct of parotid gland. Usually the Wharton duct empties into the floor of the mouth, but rarely joins the duct of the parotid gland, called Stensen duct, which ends leading to a single hole in the oral cavity, adjacent the second upper molar at the level of the Stensen's papilla [2]. This finding was found in an ex vivo male human specimen so it is unknown which clinical alterations was presented or the consequences brought with this variation. It was not performed subsequent histological study so there is no exact information about the type of tissue in each duct.

However, many cases show evidence of anatomical variations of the parotid gland in the presence of double ducts, which may also be associated with the binding of a submandibular duct with the parotid duct. Unfortunately, although there are no reported cases concerning the union of the submandibular gland duct with duct of the parotid gland unilaterally, as it was found in this case. Although, Fernandez De Souza *et al.*; reported the case of a parotid gland with the presence of two ducts located on the right side unilaterally ending a single orifice leading to the Stensen's papilla, which by histological study evidence that the two ducts belongs to the parotid gland [10]. In 2011, Astik *et al.*; also reported the case of bilateral parotid gland ducts and states that the presence of these can be explained by these morphological development [11].

Therefore, it is important to know the different anatomical variations that can be present in the excretory ducts of the salivary glands, because not only these variations can confuse the real diagnosis suffered by a patient if he is not aware of the existence of these, but is also of special attention for surgeons when operating to avoid any complications or laceration of the duct [12]. Additionally, it is essential that radiologists are enlightened about it to facilitate and assist in the diagnosis of these ducts by radiographic studies [13, 14].

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REFERENCES

1. Rastogi R, Bhargava S, Mallarajapatna GJ, Singh SK; Pictorial essay: Salivary gland imaging. *The Indian Journal of Radiology & Imaging*. 2012;22(4):325-33.
2. Amano O, Mizobe K; Anatomy and Histology of Rodent and Human Major Salivary Glands: — Overview of the Japan Salivary Gland Society-Sponsored Workshop—. 2012;45(5):241-50.
3. Michael Latarjet AR; Anatomía Humana. 4 ed: Ed. Médica Panamericana; 2005. 910 p.
4. Karaca Erdoğan N, Altay C, Özenler N, Bozkurt T, Uluç E, Dirim Mete B, *et al.*; Magnetic Resonance Sialography Findings of Submandibular Ducts Imaging. *BioMed research international*. 2013;2013.
5. Buckenham T; Salivary Duct Intervention. *Seminars in Interventional Radiology*. 2004;21(3):143-8.
6. Mori S, Wada T, Harada Y, Toyoshima S; Accessory duct in the submandibular gland. *Oral surgery, oral medicine, and oral pathology*. 1986;62(5):607-8.
7. Koybasioglu A, Ileri F, Gencay S, Poyraz A, Uslu S, Inal E; Submandibular accessory salivary gland causing Warthin's duct obstruction. *Head & neck*. 2000;22(7):717-21.
8. Gupta DS, Tandon PN, Sharma S, Jurel SK, Majumder K; Intraglandular tooth--rare case report of tooth in submandibular salivary gland duct. *Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons*. 2011;69(9):e305-7.
9. Primo BT, da Costa DJ, Stringhini DJ, Rebellato NL, de Moraes RS, Muller PR, *et al.*; Sialolithiasis in the duct of submandibular gland: a case report in patient with epidermolysis bullosa. *The journal of contemporary dental practice*. 2013;14(2):339-44.
10. de Souza Fernandes AC, Lima RG, Rossi MA, Aguiar MC, Fernandes A, Lima G, *et al.*; Parotid gland with double duct: an anatomic variation description. *Int J Morphol*. 2009;27(1):129-32.
11. Astik RB; Embryological basis of bilateral double parotid ducts: a rare anatomical variation. *International Journal of Anatomical Variations* 2011;4:141-3.
12. Stork K, Hope A, Gunzel T, Jungehulsing M; Removal of Wharton's duct during submandibular gland excision. *The Laryngoscope*. 2008;118(5):810-2.
13. Harrison JD; Magnetic resonance identification of an accessory submandibular duct and gland: an unusual variant. *The Journal of laryngology and otology*. 2008;122(9):1015.
14. Gadodia A, Seith A, Neyaz Z, Sharma R, Thakkar A; Magnetic resonance identification of an accessory submandibular duct and gland: an unusual variant. *The Journal of laryngology and otology*. 2007;121(9):e18.