

Magnetic resonance identification of an accessory submandibular duct and gland: an unusual variant

A GADODIA, A SEITH, Z NEYAZ, R SHARMA, A THAKKAR*

Abstract

We report a case of an accessory submandibular gland and duct which is extremely rare.

Material and methods: A 20-year-old male presented with complaints of painful swelling in the right submandibular region. As a part of the radiological investigation, a radiograph occlusal view was taken digital sialography, magnetic resonance imaging and magnetic resonance sialography were performed.

Results: Digital sialography revealed a small calculus distal to the punctum with diffuse dilatation of the main duct and intraglandular branches, which passed out spontaneously prior to magnetic resonance examination. The presence of an accessory submandibular duct was well delineated on both digital as well as magnetic resonance sialography.

Conclusions: Magnetic resonance sialography is helpful in delineating the anatomy of the submandibular duct non-invasively and without associated radiation exposure. To the best of our knowledge this is the first report of magnetic resonance identifying an accessory submandibular duct and gland.

Key words: Submandibular Gland; Salivary Ducts; Sialography; Magnetic Resonance Imaging

Introduction

Congenital abnormalities of the submandibular duct are rare. Congenitally imperforate submandibular ducts and duplications of the submandibular gland and duct have been reported.¹ To the best of our knowledge, up until now, only eight cases of duplication anomalies of the submandibular duct have been reported. In this article we present a case of an accessory submandibular gland and duct.

Case report

A 20-year-old male presented with complaints of swelling in the right submandibular region for two months. The swelling was painful and increased during food intake. No history of weight loss, anorexia or dry mouth was present. On physical examination the right submandibular gland was enlarged and mildly tender. There was no cervical adenopathy. Intraoral examination revealed a single right submandibular papilla which was mildly inflamed. No calculus could be palpated in the submandibular duct. There was no abnormality in gingival or oral mucosa.

No calculus was seen in the submandibular duct and the gland on the radiograph occlusal view. Digital sialography of the right submandibular gland revealed a small filling defect just distal to the punctum suggestive of calculus, with diffuse dilatation of the main duct and intraglandular branches (Figure 1a). In addition, an accessory duct was seen running parallel to the main duct and joining it distal to the papilla (Figure 1b). On post-lemon delayed images there was stasis of contrast in the main duct.

Magnetic resonance imaging (MRI) and magnetic resonance sialography of the submandibular region was planned to assess the status of the gland and duct. When the patient

came for magnetic resonance examination he gave a history of the spontaneous passage of a small calculus two days after digital sialography. Magnetic resonance sialography was done by performing a T2-weighted three-dimensional constructive interference in steady state sequence (Figure 2a). No calculus or ductal narrowing was identified and ductal dilatation was reduced as compared to the digital sialography. The presence of an accessory submandibular duct was also well delineated, which was approximately 2 cm long and joined the main duct 5 mm distal to the papilla (Figure 2a). A turbo spin echo T2-weighted sequence was performed to assess the status of the gland. The signal intensity of the submandibular gland was normal and a small accessory gland was seen near the middle of the main duct (Figure 2b). The left submandibular gland and duct were normal. The patient's symptoms gradually resolved following passage of the calculus and surgery was deferred. He was advised to come back if the symptoms reoccurred.

Discussion

Wharton's duct is the main duct of the submandibular gland, which forms by a hollowing of the epithelial tissue in the floor of the mouth during development.¹ When the terminal part of the duct fails to develop it results in imperforation of the submandibular duct and development of cystic lesions in the floor of the mouth. If the developing duct invaginates in two places or if a premature ventral branching of the duct occurs an accessory submandibular gland and duct will form.²

Our literature search revealed only eight case reports of a duplication anomaly of the submandibular duct.¹⁻⁸ Most of the reported ductal duplications were unilateral.

From the Department of Radio-diagnosis and the *Department of ENT, All India Institute of Medical Sciences, New Delhi, India.

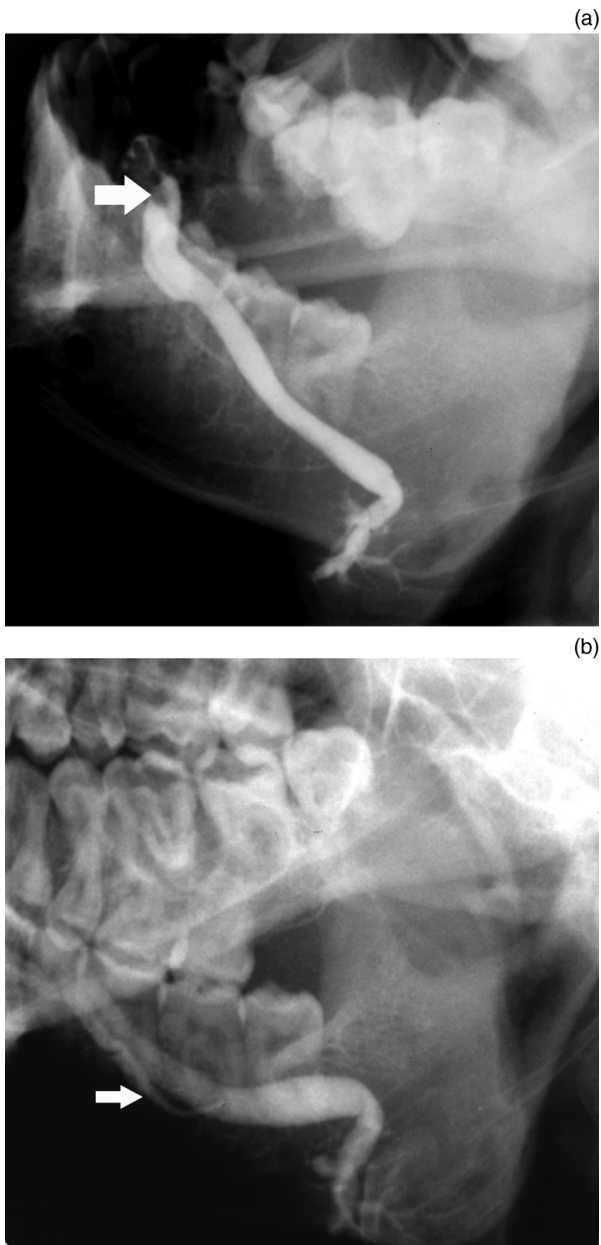


FIG. 1

(a) Digital sialography of the right submandibular gland reveals a small calculus just distal to the punctum (arrow) with diffuse dilatation of the main submandibular duct and intraglandular branches. (b) Digital sialography also shows an accessory duct (arrow) which is running parallel to the main duct.

There are two case reports of bilateral duplication of the submandibular duct.^{7,8} An accessory duct is usually smaller in calibre and runs parallel to the main duct. The length of the accessory duct may be variable, ranging from small to almost the same length as the main duct. Most of the previously reported cases of duplication anomaly were detected incidentally during sialography, however, in one case the presentation was sialadenitis and ranula in another.¹⁻⁸ As duplication anomalies are mostly asymptomatic, treatment is only needed for associated disease process involving the duct.

Conventional or digital sialography has been used for investigating the ductal system of the major salivary

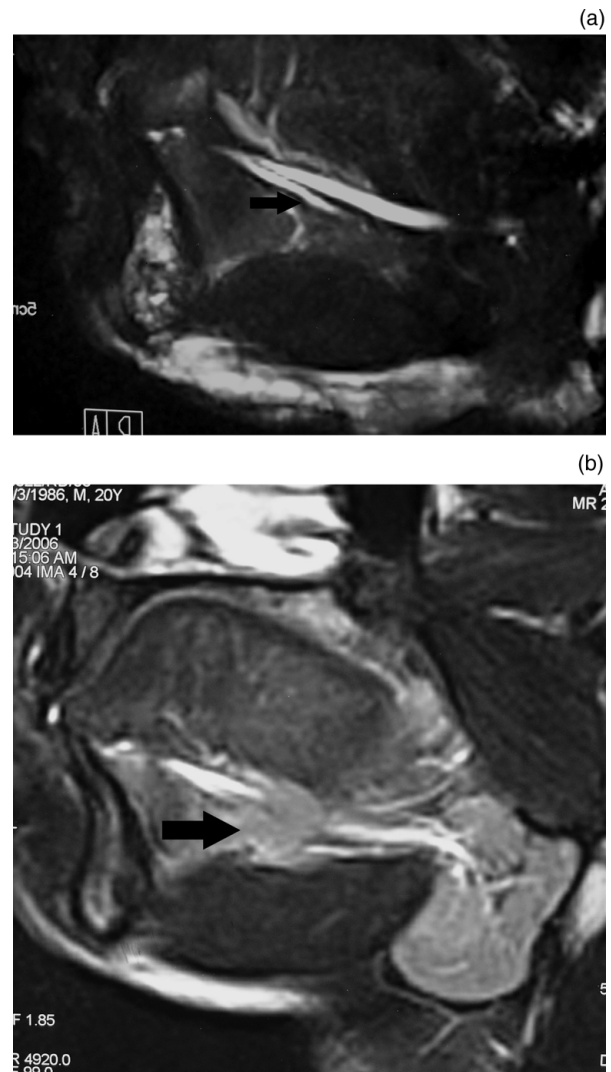


FIG. 2

(a) T2-weighted three-dimensional constructive interference in steady state sequence: maximum intensity projection along the plane of the submandibular duct reveals the presence of an accessory submandibular duct (arrow). (b) A turbo spin echo T2-weighted sequence lateral oblique image demonstrates normal signal intensity of the submandibular gland and a small accessory gland near the middle of the main duct (arrow).

glands. This technique requires cannulation of the duct, instillation of contrast material and exposure to radiation. Magnetic resonance sialography is a new non-invasive technique that produces images similar to those of conventional sialography without use of contrast media or radiation.⁹ Magnetic resonance sialography with T2-weighted three-dimensional constructive interference in steady state sequence is highly sensitive and specific for delineation of the submandibular ductal system.¹⁰ Being a cross-sectional modality, MRI also tells us about the presence and location of any accessory gland and any underlying disease process involving glandular tissue.

In our case there was a unilateral duplication of the submandibular duct with a small duct (approximately 2 cm long) running parallel to the main duct and draining a small accessory gland, which is similar to the case described by Towers.⁶ In all previously reported cases, conventional sialography has been used to demonstrate ductal

anomalies. This is the first case to demonstrate the appearance of an accessory submandibular duct and gland on magnetic resonance sialography. Although on digital sialography the presence of a calculus and ductal dilatation was seen, MRI was performed to evaluate the status of the underlying gland. In the presence of chronic sialadenitis the gland is usually enlarged and there is an altered signal intensity which reflects the degree of chronic inflammation.¹¹

References

- 1 Pownell PH, Brown OE, Pransky SM, Manning SC. Congenital abnormalities of submandibular duct. *Int J Pediatr Otorhinolaryngol* 1992;**24**:161–9
- 2 Jafek BW, Strifo JL. Accessory lobe of the submandibular glands. *Radiology* 1973;**109**:75–7
- 3 Rose BH. Bifurcation of the submaxillary duct. *Am J Surg* 1932;**17**:257–8
- 4 Mori S, Wada T, Harda Y, Toyoshima S. Accessory duct in the submandibular gland. *Oral Surg Oral Med Oral Pathol* 1986;**62**:607–8
- 5 Rahmothulla M. A rare case of accessory duct in submandibular sialography. *J Ind Dental Assoc* 1973;**45**:563–5
- 6 Towers JF. Duplication of the submandibular salivary duct. *Oral Surg Oral Med Oral Pathol* 1977;**44**:326
- 7 Myerson M, Crelin ES, Smith HW, Conn NH. Bilateral duplication of the submandibular ducts. *Arch Otolaryngol* 1966;**83**:488–90
- 8 Codjambopoulo P, Ender-Griepkoven I, Broy H. Bilateral duplication of the submandibular gland and the submandibular duct. *Rofo* 1992;**157**:185–6
- 9 Kalinowski M, Heverhagen JT, Renberg E, Klose KJ, Wagner HJ. Comparative study of magnetic resonance sialography and digital subtraction: sialography for benign salivary gland disorders. *AJNR Am J Neuroradiol* 2002;**23**:1485–92
- 10 Jager L, Menauer F, Holzknrecht N, Scholz V, Grevers G, Reiser M. Sialolithiasis: MR sialography of the submandibular duct – an alternative to conventional sialography and US? *Radiology* 2000;**216**:665–71
- 11 Som PM, Brandwein MS. Salivary glands: anatomy and pathology. In: Som PM, Curtin HD eds. *Head and Neck Imaging*, 4th edn. St. Louis: Mosby 2000;**2**:2005–133

Address for correspondence:

Dr Ashu Seith,
Department of Radio-diagnosis,
All India Institute of Medical Sciences,
New Delhi, India,
110029.

Fax: (91) 11 2686 2663

E-mail: ashubhalla1@yahoo.com

Dr A Seith takes responsibility for the integrity of the content of the paper.

Competing interests: None declared
