CASE REPORT

A 60-year-old man presented with a painless blackish well defined nodule in the parotid duct region of the left buccal mucosa. The nodule was ~1.0 cm in diameter, freely movable, and present 2 months (Fig. 1). The medical history was noncontributory, and the main clinical diagnosis was of a foreign body. An excisional biopsy was performed under local anesthesia, and 3 blackened stone-like fragments associated with soft tissue were removed from the parotid duct and submitted to histopathologic examination.

Macroscopic analyses of the surgical specimens showed 1 well defined black structure inside the soft tissue and 3 stone-like black fragments (Fig. 2). Microscopic analyses of the soft tissue fragment revealed a sialolith within the dilated excretory salivary duct, which presented squamous metaplasia (Fig. 3, A). The sialolith displayed a lamellated pattern of calcification with alternation between eosinophilic and basophilic zones disposed concentrically (Fig. 3, B). In an attempt to elucidate the nature of the black stone-like material, scanning electron microscopy (SEM; Jeol JSM-5600LV) and energy-dispersive x-ray analysis were performed. The SEM analysis of the external surface displayed a cobblestone aspect, sparse cellular elements, and organic membranous remains on the surface. Also, the longitudinal fracture surface of the black stone-like material showed parallel arrangement of the crystalline structures (Fig. 4, A). The energy-dispersive x-ray analysis detected large amounts of carbon (C), silicium (Si), calcium (Ca), phosphorus (P), and sodium (Na) on the rough external surface, with a predominance of C over the other elements (Fig. 4, B). The chemical components observed in microanalyses of the black stone-like material allowed the diagnosis of sialolith. At the time of writing, the patient had been under clinical follow-up for 12 months with no recurrences and no alteration of parotid gland function.
DISCUSSION

Sialoliths often develop in the ducts of the salivary glands, accounting for 30% of salivary diseases and most commonly involving the submandibular glands (83%-94%) and less frequently the parotid glands (4%-10%) and sublingual glands (1%-7%). Many theories have been proposed to explain salivary calculus formation, including calcification around foreign bodies, desquamated epithelial cells, and microorganisms. In general, sialoliths are composed of an organic and an inorganic matrix presenting calcium phosphate as the major component; show a central core and a laminar peripheral structure.

Sialolithiasis usually appear around the age of 40 years old, though it can also have an early onset in teenagers and can also affect older patients. Sialolithiasis has a predilection for male patients, particularly in cases of parotid gland. In the parotid gland, salivary calculi usually occur unilaterally inside the duct, and their size is frequently <1 cm. The present case showed similar clinical features compared with previously reported cases: the patient was a 60-year-old man at the time of the diagnosis, presenting with an unilateral asymptomatic growth in the left parotid duct measuring ~1 cm.

Most patients present with a single stone. However, multiple stones occur in 32% of cases in the parotid gland and 22% in the submandibular gland. Ben Lagha et al. evaluated 239 published cases of sialoliths of the minor salivary glands and found multiple sialoliths described in 3 cases. Liu et al. evaluating a semirigid endoscopic technique for diagnosis and management of sialoliths in the Stensen’s duct, encountered 6 out of 12 analyzed ducts presenting multiple sialoliths. In the present case, the patient presented 4 sialoliths in the Stensen’s duct.

Some different blackened foreign materials have been described in different sites of the oral mucosa, such as plastic fragments from a child’s toy, artificial finger nail, and iron fragment, but none inserted in the Stensen’s duct. Moreover, the clinical and macroscopic appearance of the material (blackened multiple fragments) was very suggestive of foreign bodies, not sialoliths. Therefore, SEM and energy-dispersive x-ray analysis was used to determine the nature of the material. Riesco et al. and Kasaboğlu et al. investigated the

Fig. 3. A, Dilated excretory salivary duct presenting squamous metaplasia and containing a sialolith (hematoxylin-eosin [HE], ×25). B, Lamellated pattern of calcification with alternation between eosinophilic and basophilic zones disposed concentrically (HE, ×100).

Fig. 4. A, Scanning electron microscopy of the stone-like fragments. B, Energy-dispersive x-ray analysis: peaks of carbon.
structure of sialoliths and their apparent parallel arrangement of the crystalline structures to determine their microscopic morphology and chemical composition. They observed that salivary calculi are mainly composed of Ca, P, carbonate, and small amounts of Mg, potassium chloride, and ammonium. In the present case, SEM analysis showed parallel arrangement of the crystalline structures, and the energy-dispersive x-ray analysis of the crystalline structures detected varied amounts of C, Si, Ca, P, and Na with a predominance of C, leading to the diagnosis of sialolith.

In conclusion, this case showed that SEM and energy-dispersive x-ray analysis are useful tools for diagnosis of some oral lesions with distinct presentation, and these special diagnosis techniques might be used to identify the origin of structures associated with the lesions.

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REFERENCES


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