Case Report

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Parotid duct sialolith in a male dromedary camel (*Camelus dromedarius*)

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ABSTRACT

A male camel, aged 11 years, had a solid and mobile mass on the left side of the upper jaw. X-ray imaging showed a distinct, radiopaque and oval-shaped mass at the level of the parotid duct. The condition was diagnosed as left parotid duct sialolithiasis. The sialolith was surgically removed through a transcutaneous approach. The male camel had uneventful recovery without complications. This paper reported a rare case of sialolithiasis in dromedary camel and described its clinical presentation, diagnostic findings, and surgical treatment.

Case presentation

An 11-year-old male dromedary camel weighing 550 kg was presented to the Veterinary Teaching Hospital, Assiut University. The complaint was a mass located in the left cheek region (Fig. 1). According to the owner, the mass was initially noticed about 6 months ago and gradually increased in size since then. The camel has experienced difficulty in eating for the past 3 months but has had no issues with drinking or working.

Fig. 1. Swelling on the left check at the level of facial crest.

During a general physical examination, no abnormalities were detected except for a hard mass located in the left maxillary region at the level of third maxillary cheek tooth. It was observed to be firm, easily movable, and did not cause any pain when palpated (Fig. 2). The mass measured approximately 3 cm in diameter and 6 cm in length. Slight fluid dilatation was observed caudal to the mass. Based on the provided information, the mass in the left maxilla region of the camel could potentially be attributed to various conditions. These include sialolithiasis, sialodenitis, buccal neoplasia, chronic tooth root abscess, metaplasia (abnormal tissue transformation), or dystrophic calcification (calcium deposits in tissues). These are potential differential diagnosis that should be considered based on the observed characteristics of the mass.

Fig. 2. Holding a freely hard object at the level of facial crest.

Dorso-ventral radiograph of the head revealed an ovoid mineralized radiopaque structure abaxial to the left maxilla and dorsocaudal to the commissure of the lips. The case was diagnosed as left parotid duct sialolithiasis. The camel underwent a surgical procedure to remove the sialolith using a transcutaneous approach. Prior to surgery, the camel was sedated by intravenous administration of Xylazine HCl (Xyla-Ject, ADWIA

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Co., SAE, Egypt) at a dose of 0.2 mg/kg of body weight. Local anesthesia was achieved by infiltrating lidocaine 2% (Alexandria Co. for Pharmaceutical and Chemical Industries, Alexandria, Egypt) into the area. The camel was positioned in a kush position with head tilted in a way that the left cheek was up. A 5 cm skin incision was inflicted using a #10 scalpel blade over the mass (Fig. 3). The underlying tissue was dissected until the parotid duct was reached (Fig. 4). The duct wall was incised over the mass exposing a creamy white hard object. The mass was exteriorized (Fig. 5) and the duct was flushed with normal saline. The parotid duct was checked for patency by introducing a polypropylene tube toward the duct ostium (orally). The parotid duct was then sutured by double layer of simple continuous sutures using #2/0 polyglycolic acid (PGA, M-Natur, Internation Suture Manufacturing Co., Egypt) followed by closure of the subcutaneous tissue by a layer of simple continuous sutures using the same suture material. The skin was then closed by a simple continuous suture pattern (Fig. 6) using #2 silk (Silk, M-Natur, Internation Suture Manufacturing Co., Egypt). After the surgery, the camel received systemic antibiotics (Combikel 20+20, KELA N.V., St. Lenaartseweg 48, 2320 Hoogstraten, Belgium ,12.5ml/200kg.bwt) for 5 days, phenylbutazone as an anti-inflammatory drug (Phenyloject, ADWIA Co., SAE, Egypt) for 3 days, and local antibiotic spray (Bivatracin, Egyptian Company for Advanced Pharmaceuticals (ECAP)) for the skin wound.

Fig. 3. Surgical incision (5 cm) over the swelling.

Fig. 4. Exposure of the stone from the parotid duct.

Fig. 5. Extraction of the stone from the parotid duct.

The sialolith was cleaned by distilled water and examined. It appeared nearly cylindrical with blunt ends, creamy white in color, with rough surface at one aspect and smooth at the rest of surface. It measured 6 cm in length, 3 cm in diameter, and weighed 50 g (Fig. 7). A longitudinal section in the stone was induced using a m*et al* saw revealed an easy cut as in a chalky material indicating that the composition was mostly Calcium carbonate. The cut surface was homogenous without lamellae nor presence of a nidus of expholiated cell or foreign material at the center (Fig. 8).

Fig. 6. Closure of the surgical wound.

Fig. 7. Sialolith: 6 cm length, 3cm diameter and 50g weight.

Fig. 8. Salivary stone after splitting into two halves.

Discussion

The case report here described rare case of sialolithiasis in the parotid duct of a dromedary camel. Sialolithiasis has been reported frequently in mare and donkeys (Misk and Nigam, 1984; Singh *et al*., 1987; Bouayad *et al*., 1991; Kay, 2006), buffalo (Joshi *et al*., 2003), cattle (Ali *et al*., 1978; Tyagi and Kumar, 2015), camel (Barvalia *et al*., 1992), dog (Bartels, 1978; Han *et al*., 2016), monkey (Ensley *et al*., 1981), chimpanzee (Orkin *et al*., 1990) and even in human (Biddle and Arora, 2008). Sialolithiasis is long standing condition in which the stone takes a long time to form (Singh *et al*., 1987). Currently the salivary stone has been formed in camel in about 6 months without serious clinical manifestations. Typically, sialoliths are solitary, as observed in the current case; however, multiple stones have also been reported (Singh *et al*., 1987). In general, sialolithes are smooth and oval-shaped unlike this case where the stone was rough cylinder with

blunt ends and relatively rough depressed surface at one side. Although, a nidus has been reported to be in the center of the stone in other species (Orkin *et al*., 1990), such nidus in the form of foreign body or exfoliated epithelium was not observed in the current case. Moreover, the lamellate pattern in cross section was not currently the seen, unlike the shape in most other species (Misk and Nigam, 1984; Kay, 2006). These stones are commonly made up of concentric layers of calcium carbonate surrounding a central core of organic matter, similar to what is seen in horses (Bouayad *et al*., 1991; Baskett *et al*., 1995). The diagnosis of sialolithiasis relies on observing clinical signs and digital palpation. In the current case, the sialolith was typically manifested as firm, painless swellings located in front of the facial crest, specifically at the level of the upper third cheek tooth similar to what was found in other cases (Baskett *et al*., 1995; Kay, 2006). To confirm the diagnosis, radiographs can be used to show a clear mineral density within the soft tissue in this specific area (Baskett *et al*., 1995). Other potential diagnoses to consider include sialodenitis, tooth abscesses, and buccal tumors (Baskett *et al*., 1995; Kay, 2006). Additionally, metaplasia or dystrophic calcification is alternative possibilities to consider as well. The exact cause of sialolithiasis is not known, but it is believed that organic matter serves as a core around which calcium salts accumulate (Orkin *et al*., 1990; Bouayad *et al*., 1991; Rakestraw, 2006; Kay, 2006). This organic matter can be a foreign object, like grains or grass, entering the parotid duct through the salivary papilla as reported before in horse (Baskett *et al*., 1995) and buffalo (Joshi *et al*., 2003). It can also be cellular debris and bacteria resulting from sialodenitis (Bouayad *et al*., 1991; Baskett *et al*., 1995). In horses, sialoliths can grow to be more than 10 cm long, leading to blockage of the parotid salivary duct. This obstruction can cause saliva retention, stasis, and movement of bacteria, resulting in acute sialodenitis (Bouayad *et al*., 1991; Baskett *et al*., 1995).). Although not observed in this particular case, sialolithiasis can sometimes lead to discomfort, difficulty swallowing (dysphagia), and potential gland atrophy due to salivary gland dysfunction and oral mucosal ulceration (Bouayad *et al*., 1991; Baskett *et al*., 1995; Kay, 2006). Unlike the cases mentioned earlier, the owner of this particular case did not report any of these complications. It seems that sialolith formation has not been reported to show a predisposition towards any specific gender or age group (Ensley *et al*., 1981). It is worth noting that sialolithiasis tends to occur more frequently in animals residing in drier environments. In human medicine, studies have indicated that individuals with higher levels of calcium in their saliva may have a higher likelihood of developing sialoliths. This elevated calcium level could potentially be attributed to lower levels of myoinositol hexaphosphate (phytate), which acts as an inhibitor for crystallization (Biddle and Arora, 2008). Additionally, certain factors such as renal lesions, primary hyperparathyroidism, granulomatous disease, and hypervitaminosis D could potentially lead to hypercalcemia and subsequently increase salivary calcium levels (Biddle and Arora, 2008). Based on the information provided, the camel in this case did not exhibit any clinical signs associated with hypercalcemia, such as increased urination and thirst, or any other noticeable lesions. Surgical removal of sialoliths is typically done through a transoral approach, allowing the incision to heal naturally (Baskett *et al*., 1995; Kay, 2006). Previously, a percutaneous approach was commonly used for sialolith extraction (Misk and Nigam, 1984; Kay, 2006), especially for larger or hard-to-reach stones. However, this method may lead to complications like the formation of a salivary fistula if the closure of the duct is not successful (Barvalia *et al*., 1992; Kay, 2006; Rakestraw, 2006). Another potential risk associated with the percutaneous approach is unintentional damage to the facial nerve, specifically the dorsal branch, which runs just above the surgical site. When incisions are allowed to heal naturally, complications are minimal (Kay, 2006). However, in some cases, secondary sialodenitis may occur after simple sialolith extraction, requiring postoperative rinsing and antimicrobial treatment (Baskett *et al*., 1995). Healing of this case of sialolithiasis in the parotid duct of the camel was uneventful, and there were no complications following the percutaneous approach for its surgical removal.

Conflict of interest

The authors declare that they have no conflict of interest to disclose.

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