Unusual exophytic gingival lesion in a newborn treated with diode laser

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Gingival lesions rarely occur in newborns. However, when present, they commonly worry the parents and impair the infant's feeding, thus affecting growth. Such lesions are usually nonneoplastic in nature, although malignancies may develop; therefore, specimens must be submitted for histopathologic examination. A 2-month-old girl presented with a 10-mm nodule on the anterior lower alveolar ridge in association with natal tooth extraction and neonatal tooth eruption. The lesion was excised with high-power laser under local anesthesia, and a histopathologic diagnosis of a peripheral ossifying fibroma was made. In addition to peripheral ossifying fibromas being rare in newborns, the use of high-power lasers for surgical procedures in newborns have been proven to be safe, comfortable, and efficient. (Oral Surg Oral Med Oral Pathol Oral Radiol 2020;130:e74–e79)

Gingival lesions rarely occur in newborns. However, when present, they commonly cause the parents to worry, make the infants irritable, and impair their eating and breathing. These lesions usually represent benign entities, but malignancies, in rare cases, can develop. Thus, histopathologic examination of these lesions must be performed. The use of high-power lasers in pediatric dentistry has been explored to help reduce stress and fear in infants during surgery, a pivotal issue in pediatric dentistry.[1]

Peripheral ossifying fibroma (POF) is a reactive nonneoplastic lesion, arising exclusively in the gingiva.[2,3] POF is believed to originate from hyperreactive undifferentiated cells of the periodontal ligament, stimulated to proliferate by chronic irritation or trauma.[3,4] This lesion most commonly affects females in the second and third decades of life. POF is the most common reactive gingival lesion (33%) in patients 0 to 19 years of age.[5] However, 95% of these cases were reported in individuals 10 and 19 years of age.[2,5] Occurrence in newborns is rare, with only 3 cases reported to date.[3,6,7] This case report seeks to present a case of POF in a newborn and discusses clinical differential diagnoses, as well as the safe and efficient use of high-power lasers in the surgical excision of the lesion.

CASE REPORT

A 2-month-old female infant was admitted to the Oral Medicine Clinic of the School of Dentistry at the Universidade Federal de Minas Gerais (UFMG) in Belo Horizonte, Brazil, for treatment of a nodular lesion on the anterior lower alveolar ridge, which was reported to have appeared 45 days before clinical examination. The baby had been born preterm (36 weeks' gestational age) via normal delivery, and the mother had a prenatal history of diabetes and eclampsia during pregnancy. According to the parents, the infant had a natal tooth (primary mandibular left central incisor, tooth #71), which was removed when she was 15 days old. Moreover, the parents reported current impairment in sucking, swallowing, and breathing, leading to irritability in the infant.

Physical examination revealed a nodular, firm, pedunculated lesion, measuring 10 × 5 mm and covered by pink, flat, smooth mucosa (Figure 1A). The patient demonstrated no pain when the lesion was pressed. An occlusal radiograph failed to demonstrate the lesion, but it did show the absence of tooth #71 and the primary mandibular right central incisor (tooth #81) erupting under the lesion (Figure 1B).

The clinical diagnostic hypotheses were a nonneoplastic proliferative lesion and congenital epulis. Therefore, excisional biopsy was performed under

Statement of Clinical Relevance

Peripheral ossifying fibromas are rare in newborns and usually associated with natal/neonatal teeth. The lesion can impair the infant's feeding, thus affecting physical and cognitive development. Differential diagnoses of oral soft tissue growths in newborns are discussed.

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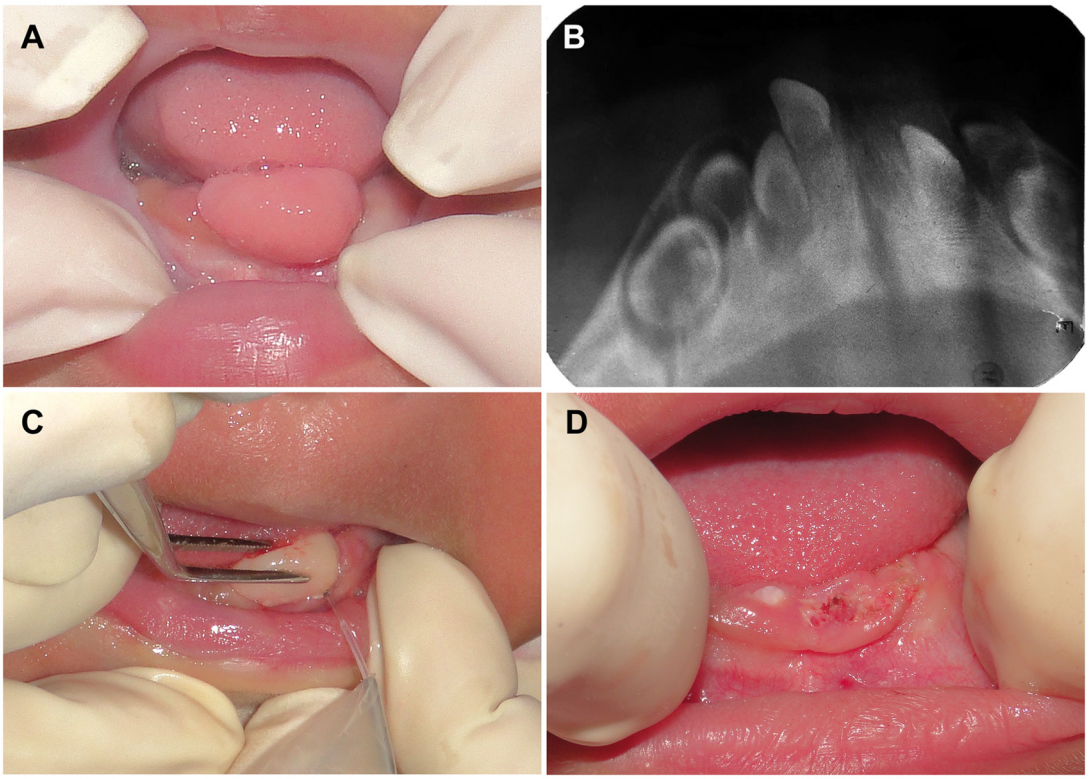

Fig. 1. Clinical and imaging findings. **A,** Initial presentation: pedunculated nodule on the anterior lower alveolar ridge, covered by healthy mucosa. **B,** Occlusal radiograph: the absence of tooth #71 (previously removed), tooth #81 erupting under the lesion, and no further image associated with the lesion itself. **C,** Surgical approach: linear incision using a diode laser, performed along the pedicle, showing minimum bleeding. **D,** Immediate postoperative hemostasis, with ulceration and presence of tooth #81.

local anesthesia (lidocaine 2% with epinephrine 1:100,000), using a diode laser (Thera Lase Surgery; DMC Equipamentos, São Carlos, SP, Brazil). Laser specifications were 808 nm, optical fiber of 400 μm, and potency of 2.5 W in continuous-wave mode. Protective stabilization was followed to ensure a safe procedure.[8] A linear incision was made in the pedicle (Figure 1C). Minimum bleeding and the presence of tooth #81 was noted (Figure 1D). The patient could feed and suck comfortably the day after the surgery, and there was no recurrence after 13 months of follow-up.

Microscopic examination of the surgical specimen revealed a lesion covered by hyperplastic squamous epithelium, presenting a proliferation of round mesenchymal cells in the lamina propria, which was associated with deposits of mineralized material, similar to bone (Figure 2). No evidence of odontogenic epithelium was observed. Therefore, the final diagnosis was peripheral ossifying fibroma.

DISCUSSION

Diverse lesions may appear as a soft tissue mass in the oral cavity of newborns and/or children and consist of clinical differential diagnoses in such cases.[5,9]

The congenital granular cell lesion, also known as congenital epulis, is a rare lesion in newborns, appearing at birth, and commonly emerges on the maxillary alveolar ridge of female newborns as a sessile or pedunculated nodular mass, with a smooth and pink surface.[7,10,11] Despite sharing some clinical similarities with a congenital granular cell lesion (female newborn with nodular and pink lesion), in the current case, the mandible was affected, and the lesion was not present at birth.

Fibrous hyperplasia is a common reactive lesion, although rarely described in newborns.[12,13] From the 2 cases reported in the literature, it appears that fibrous hyperplasia of newborns presents features similar to those of lesions occurring in adults, that is, pedunculated, firm, and pink-colored lesions with a smooth surface. Both reported lesions were associated with natal teeth.[12-15] On the basis of its prevalence in the general population and its similarity to both previous reports in newborns, fibrous hyperplasia was considered in the current case.

Hamartomas are nonneoplastic tissue malformations,[16] and there are reports of an association with natal teeth and both genders being affected.[17-19] In such cases, the lesions are firm, pink, and pedunculated

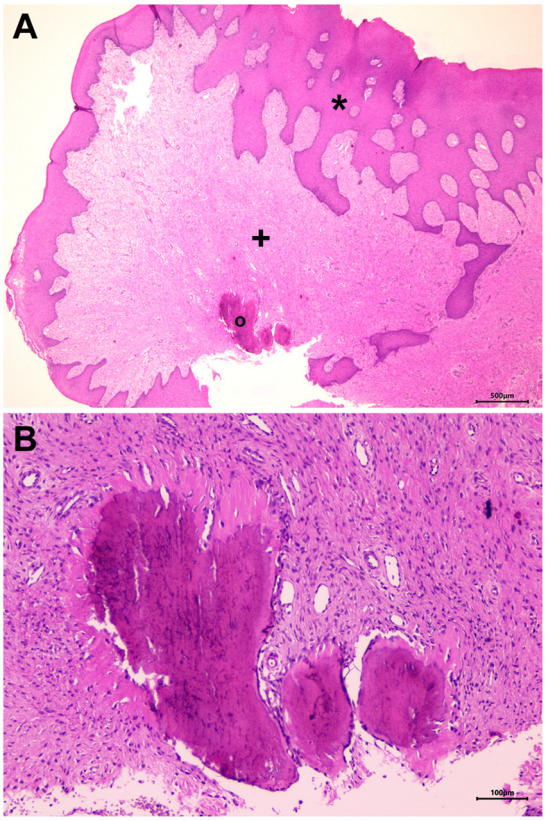

Fig. 2. Microscopic findings. **A,** Oral mucosa covered by hyperplastic squamous epithelium *(asterisk)*. Lamina propria presenting proliferation of round fibroblasts *(cross)* intermixed with calcified deposits *(circle)* (hematoxylin and eosin [H&E], original magnification × 20). **B,** High-power view of fibroblast proliferation in association with mineralized round deposits (H&E, original magnification × 100).

nodular masses, approximately 10 mm in diameter and located on the lower gingiva.[17-19] The clinical aspects reported are similar to those of the present case, and as such, hamartoma was included as a hypothesis.

Pyogenic granuloma is also a reactive lesion, with rare occurrence in infants.[20] In newborns, most lesions were associated with the presence of a natal tooth, the patients were predominantly males, and the lesions occurred preferentially in the anterior mandibular alveolar ridge. Clinically, the lesions presented an exophytic pedunculated growth, irregular shape, smooth or lobulated surface, red coloration, and spontaneous bleeding when breastfeeding in some cases.[21-23] The lesion reported here showed no red coloration, lobulated surface, or bleeding typical of pyogenic granuloma. Therefore, this diagnosis was considered less likely.

Martelli-Júnior et al.[24] reported the case of a 4-month-old female with a congenital peripheral odontogenic fibroma presenting as an isolated, exophytic, sessile, firm, and well-defined lesion on the upper alveolar ridge.[24] The clinical aspects of the current case were compatible with those in the previous report, except that the lesion in our case was pedunculated and appeared in the mandible. However, this hypothesis was considered improbable because of the rarity of this type of lesion.

Glial choristoma is a tumor-like mass consisting of mature brain tissue and occurs in the oral cavity; however it has no connection to the central nervous system and is extremely rare.[25] Some cases of oral glial choristoma have been reported in infants and children (age range newborn to 3 years), mainly in female infants, on the palatopharyngeal area and the tongue.[26] Clinically, it appears as a large, firm mass, covered by normal oral mucosa.[25] Although it is an extremely rare entity, glial choristoma shares some clinical features with the lesion in the current case.

Hemangioma is a common neoplasm found in infants and can appear at birth or during the early neonatal period.[27] Oral hemangioma commonly affects the lips, tongue, or buccal mucosa and appears as a red macula, papule, or nodule. The lesion occurs commonly in white females, twins, and premature infants.[28] Some cases of oral hemangiomas have been reported in neonates,[29] usually arising as extensive lesions, affecting more than 1 site in the oral mucosa or other head and neck regions.[29,30] However, the clinical appearance, location, and behavior of oral hemangiomas of newborns did not seem to be in accordance with those in the present case.

Rhabdomyosarcoma is a malignant muscular neoplasm that predominantly affects children and most commonly occurs in the head and neck region. However, the oral cavity is not usually involved, representing 10% to 12% of all head and neck cases.[31] The tongue, palate, and buccal mucosa are the most common sites, and most studies have shown a slight predilection for males. Clinical presentation in the head and neck area tend to vary from a small cutaneous nodule on the face to an extensive fast-growing facial swelling. The lesion may be asymptomatic or associated with pain, trismus, paresthesia, facial palsy, aural discomfort, or nasal discharge. Congenital presentation of oral rhabdomyosarcoma has been reported, but it is quite unusual.[32] The fast-growing nature of rhabdomyosarcoma, which can reach large dimensions and affect diverse structures in the head and neck region, weakened the possibility of this diagnosis in the current case. Nevertheless, this is an important malignancy to be considered in the differential diagnosis of oral lesions in children.

One case of a large pulp polyp that has been reported in the literature, and the lesion in that case appeared as a pedunculated, pink-colored mass on the alveolar ridge of a 4-month-old female, who had mandibular

natal teeth.[33] The current case showed clinical features similar to those of an exuberant pulp polyp, but this was a rare possibility.

Neurofibroma is a benign neural neoplasm, with a peak incidence in the second and third decades of life.[34] We could not find any report of a solitary neurofibroma occurring in the oral cavity of a newborn. We found some reports of plexiform neurofibromas in neonates, but most were located in the posterior pharyngeal wall.[35-37] Therefore, this hypothesis was not considered plausible for the current case.

Peripheral giant cell granuloma is a reactive lesion, but there are no reports of it occurring in newborns.[38,39] This lesion has a slight predilection for females in the fourth and fifth decades of life and commonly affects the mandible, presenting as a red-to-purple gingival nodule.[38,40,41] This hypothesis was not considered in this case because of the color of the lesion and the age of the patient.

The melanotic neuroectodermal tumor of infancy is a rare benign neoplasm that occurs in the first year of life, mainly in males. It occurs preferentially in the anterior maxilla as a fast-growing, expansive, asymptomatic, bluish swelling, with firm consistency.[42,43] The tumor appears as a well-defined radiolucent lesion, with bone destruction and tooth displacement.[43] Considering that the lesion in the present case was localized, with limited growth and no bone destruction, as well as the rarity of the melanotic neuroectodermal tumor of infancy, this hypothesis did not apply to the current case.

An eruption cyst is a developmental odontogenic cyst that arises shortly before the eruption of a primary or permanent tooth into the oral cavity.[44] The cyst usually appears as a bluish, translucent, elevated, compressible, dome-shaped lesion of the alveolar ridge and occurs in the first decade of life.[45] Very few cases in newborns have been reported, with some associated with natal teeth.[45-47] When affecting newborns, eruption cysts seem to occur with greater frequency in black children as a raised, bluish gingival mass on the alveolar ridge.[46] An eruption cyst could be a pertinent hypothesis for the current case because of the presence of a natal tooth; however, the clinical presentation of a nodular, pedunculated, and firm lesion made this hypothesis less likely in this case.

Gingival cyst of newborns is a common odontogenic cyst, found in 90% of all newborns.[48] These cysts are located in the edentulous alveolar ridge of the maxilla or the mandible and appear as small, whitish nodules that disappear within a few weeks.[48,49] Considering its common occurrence in newborns, this cyst was included in the differential diagnosis. However, their expected small size (< 2 mm) and whitish color were not observed in the current case.

Teratomas are true neoplasms composed of tissues of 1 or more embryologic origins (ectoderma, mesoderma, or endoderma).[50] Neonatal teratoma is most commonly located in the sacrococcygeal region, showing a predilection for females.[51] Teratomas of the head and neck are rare, accounting for less than 1% to 10% of all teratomas, predominantly involving the cervical region, the nasopharynx, and the oropharynx.[52-54] Oral teratomas usually appear on the hard palate and tongue, and some cases tend to protrude outside of the mouth.[52] Because of the location, size, and localized growth of the lesion in the case reported here, this was considered a very unlikely hypothesis.

The final entity to be considered in the differential diagnosis of the current case was POF, a reactive nonneoplastic lesion, exclusively arising in the gingiva.[2,3] It is believed to originate from hyperreactive undifferentiated cells of the periodontal ligament, which are stimulated to proliferate as a result of chronic irritation or trauma.[3,4] This lesion is more prevalent in Caucasian adult females, with a peak incidence in the second and third decades of life. The anterior region of the maxilla is the most common site.[2,4,55] In contrast, POF is an uncommon diagnosis in the pediatric population and usually affects 10- to 19-year-olds.[5,56] The current case represents 1 of 4 reports of POF in newborns, of which 3 were associated with natal or neonatal teeth.[3,6,7]

The clinical presentation of POF in newborns may be similar to that seen in adults—that is, it is usually a pedunculated and well-circumscribed nodule, measuring 10 to 25 mm. Interestingly enough, all cases, including the present one, occurred in females. Evolution time varied from birth to 2 weeks after the removal of natal/neonatal teeth. The 4 reported lesions occurred on the anterior mandible, probably as a result of an association with natal/neonatal teeth, which are more common in this region. As mentioned above, POF arises from cells of the periodontal ligament, and the presence of teeth could be the cause of the low-grade irritation associated with the development of this lesion.

Eating impairment was the main complaint in the previous reports, as well as in the current case. It is important to note that improper feeding at this age may affect the baby's growth, as well as physical and cognitive development. Therefore, such lesions must be excised; conventional scalpel surgery was performed in the previously reported cases. In the present case, diode high-power laser was used for the surgical procedure. The aims of its use were to help reduce the stress and fear in the infant during surgery, and this is of paramount importance in the management of the behavioral management of the infant for dental treatment.[1] Moreover, laser surgery has cut precision, hemostasis occurs together with the incision, and a suture is not required.

Therefore, the surgical procedure can be faster and less traumatic. In addition, healing usually occurs faster, reducing postoperative discomfort and the need for analgesic drugs.[57] No recurrence of POF was observed during the follow-up of newborns (age range 2 weeks to 18 months).[3,6,7]

CONCLUSIONS

In summary, POFs in newborns are rare and usually associated with natal/neonatal teeth. Despite being a nonneoplastic lesion, its size and location worry the parents and impair the infant's feeding. Moreover, histopathologic evaluation is usually mandatory because the clinical aspects of POF may resemble those of several entities, including other nonneoplastic proliferative lesions and benign and malignant neoplasms. Because of its cut precision, hemostatic capacity, fast procedure time, among other properties, the diode high-power laser was an efficient and safe aid for the surgical approach in a newborn.

DISCLOSURE

The authors declare no conflicts of interest.

PRESENTATION

This case report was presented in poster format at the "XXVI Jornada Mineira de Estomatologia," held in Belo Horizonte, Brazil, May 15−17, 2019; and in the "45° Congresso Brasileiro de Estomatologia e Patologia Oral," held in Maceió, Brazil, July 17−19, 2019.

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