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Congenital vascular hamartoma of the gingiva in a calf

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Abstract

The aim of this study was to report the clinical and histopathological outcomes of a vascular hamartoma tumor of the gingiva in a calf and to evaluate the treatment results. A 3-month-old female Simmental calf was presented to the large animal surgery department of the Faculty of Veterinary Medicine, Shahid Chamran University, with a complaint of a mass in the region of the first lower incisor. The owner reported that the lesion had been present since birth and caused bleeding during feeding. Additionally, a small piece of the lesion had been torn off by the owner, resulting in severe bleeding. On clinical examination, an oval mass the size of a plum (30×20×5 mm) was observed on the surface of the lower incisors. The mass was attached to the gingiva and had pushed one of the incisors forward, displacing it out of alignment. After local anesthesia, the mass was completely removed using surgical excision. During the surgery, significant bleeding was observed, and it was found that there was a root of a deciduous tooth in the mass, which was extracted. The surgical area was closed with nylon sutures. Postoperatively, no feeding problems were observed in the calf. Based on histopathological examinations, the mass was identified as a vascular hamartoma. Gingival vascular hamartoma tumors are rare in cattle.

Key words: Congenital vascular hamartoma, Calf, Simmental breed, Pathology

Introduction

Vascular tumors in the oral and pharyngeal regions are rare, most of which originate from blood vessels (Head et al., 2002). Hemangiomas are uncommon in horses, pigs, and cattle and extremely rare in sheep and goats (Scott, 1988). The term "hamartoma" is derived from the Greek word "hamartion," meaning bodily defect (Sharma, 1998). Most vascular hamartomas are present at birth, shortly after birth, or during the neonatal period, considered as developmental anomalies (Tyler et al, 1995; Amniattalab et al, 2012; Gülbahar et al, 1999).

Bovine vascular tumors are generally benign angiomatous lesions that occur in various tissues and have been described as juvenile angiomas, hemangiomas, or hamartomas (Mohammadi et al, 2007). Hemangiomas are reported to be the most common tumors of infancy (Robbins and Cotran, 1984), but they are rare in animal

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species. Therefore, some researchers consider them as hamartomas or nevi (Mohammadi et al, 2007). The term hamartoma refers to a localized and excessive overgrowth of normal cells and tissues within an organ (Robbins and Cotran, 1984) which is a suitable term for a group of lesions that resemble tumors but are not true neoplastic tissues (Amniattalab et al, 2012; Robbins and Cotran, 1984). Hamartomas result from defective growth in an organ and consist of an abnormal mixture of similar cellular elements (Misdorp, 2002; Robbins and Cotran, 1984).

It has been reported that vascular tumors of the gingiva in the oral cavity are typically observed at birth, mostly originated from blood vessels (Nourani et al, 2007). The aim of the following case study is to describe the clinical and histopathological features of a vascular hamartoma of the gingiva in a calf and to evaluate the treatment outcomes.

Case History

The case was related to a 3-month-old female calf presented to the Large Animal Surgery Department at Shahid Chamran University of Ahvaz with a complaint of a mass on the surface of the lower incisor teeth. The owner reported that the lesion had been present since birth accompanied with bleeding during feeding. Additionally, a small portion of the lesion had been removed by the owner, resulting in severe bleeding. Clinical examination revealed an oval-shaped mass, approximately the size of a plum, located in the row of incisor teeth (Figure 1).

Figure 1: Observation of a mass, 30×20×5 mm in diameters, on the incisor region of the lower jaw in a Simmental calf

After proper immobilization, local anesthesia was administered by injecting 10 mL of 1% Lidocaine HCl around the base of the mass. The mass was excised using an elliptical incision at its base, ensuring that at least a 1 cm margin of healthy tissue was removed. Bleeding was controlled with topical epinephrine injection and electrocautery. The root of a deciduous tooth was extracted, and the gingival mucosa was closed using a simple continuous suture pattern with 1-0 nylon suture material (Figure 1). Additional bleeding was controlled by applying ice to the surgical site. The excised mass was sent to the pathology department for histopathological examination. It was noted that the mass was attached to the gingiva and had displaced one of the incisor teeth forward, causing it to misalign with the row.

Figure 2: Postoperative view after excision of the mass and extraction of one deciduous tooth root

For postoperative care, the calf was treated with penicillin-streptomycin at a dose of 20,000 IU for five days, along with daily monitoring. It was observed that the calf experienced no complications during the postoperative period, and no recurrence of the lesion was noted after the surgery (Figure 2).

Pathology

Histopathological study revealed that the mass was composed of many small capillaries with different sizes. They were covered by endothelial cells which were bulged and irregular in size. Smooth muscles were seen in the wall of larger vessels. The surface of the mass was composed of stratified squamous epithelium. Although in some area necrosis and hemorrhage and inflammatory cells infiltration were observed. no mitotic figures were seen (Figure 3).

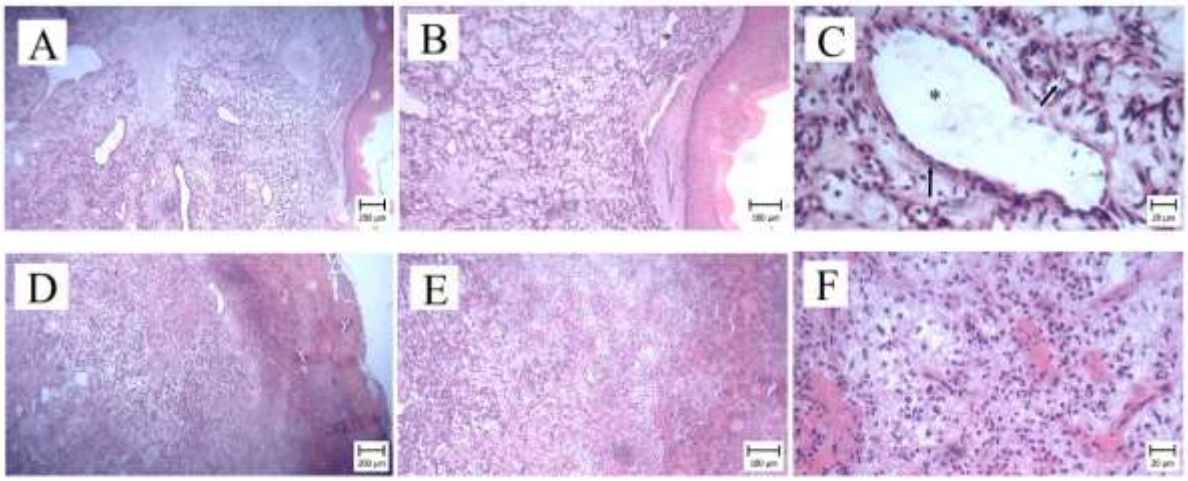

Figure 3: Microscopic figures of Hamartoma, Calf. A &D: The surface of mass is covered by ulcerated epithelium (white asterisks). B & E: Note to many small vascular structures (black asterisks) with different size. C & F: the vascular structures were covered by irregular endothelial cells (arrows). Also, inflammatory cells were infiltrated (Hematoxylin and Eosin staining. A & D: 200 µm; B & E: 100 µm; C & F: 20 µm).

Discussion

Contrary to the findings of Stanton et al, (1984), tooth extraction was not necessary, and neither electrocautery nor cryotherapy was employed in this case. The calf recovered without complications and gained weight normally in the subsequent months. No recurrence of the lesion was observed during the 12-month follow-up period (Yeruham et al, 2004).

The lesions were diagnosed as vascular hamartomas, characterized by the proliferation of numerous irregular capillary cells (not limited to endothelium) within a loose collagenous stroma. Blood vessels in hamartomas are structurally normal and retain all supportive elements, indicating that the proliferation is exclusively vascular tissue (Stanton et al, 1984; Wilson, 1990). Vascular hamartomas are developmental anomalies and are commonly described as congenital, non-neoplastic tumor-like lesions in various tissues (Gülbahar et al, 1999; Nourani et al, 2007; Benoit et al, 2005).

In this case, the anomaly was identified between the lower incisor teeth, presenting with surface ulcerations, three months after birth. As seen in this 90-day-old calf, vascular hamartomas are typically reported in the oral cavity of neonatal calves, appearing in varying shapes and sizes (Gülbahar et al, 1999; Robbins and Cotran, 1984). Similarly, it has been reported that half of all vascular hamartomas identified in young calves originate from gingival mucosa (Benoit et al, 2005).

Furthermore, such anomalies have been observed in various animal species of different ages and identified in other organs and tissues (Benoit et al, 2005; Bildfell et al, 2002; Nourani et al, 2007; Wilson, 1990). Vascular hamartomas are described as localized and excessive overgrowths of mature endothelial cells (Amniattalab et al, 2012).

In this case, the mass exhibited numerous thin-walled capillaries lined by endothelial cells. Additionally, it showed many thrombosed veins of varying diameters throughout the tissue, accompanied by hemorrhage and inflammatory cell infiltration dominated by neutrophils on the surface of the mass, likely resulting from secondary bacterial factors.

In line with our findings, many authors (Amniattalab et al, 2012; Gülbahar et al, 1999; Nourani et al, 2007) have reported that microscopically, vascular hamartomas are characterized by the proliferation of numerous blood vessels of varying sizes within loose connective tissue stroma, with necrosis and hemorrhage observed in the squamous epithelium and the superficial lamina propria. Moreover, vascular hamartomas are reported to show no mitotic activity, consistent with the findings in our case (Amniattalab et al, 2012).

It is emphasized that differentiating vascular hamartomas from hemangiomas is highly challenging. The only way to distinguish between the two lesions is through the classification of histopathological features (Amniattalab et al, 2012; Bildfell et al, 2002). While endothelial cells in vascular hamartomas are intact, well-differentiated, and irregular in size and proliferation, those in hemangiomas exhibit destructive growth, and smooth muscle cells are absent from the connective tissue of blood vessels. Therefore, distinguishing between the two lesions requires immunohistochemical confirmation (Amniattalab et al, 2012; Bildfell et al, 2002).

Additionally, this lesion must be distinguished from ameloblastoma, a benign tumor originating from odontogenic epithelium and pulpal mesenchyme. The definitive diagnosis of ameloblastoma is confirmed through histopathology (Imani et al, 2014).

Based on histopathological findings, this oral mass was identified as a congenital hamartoma. Surgical excision of the mass was performed, and the treatment was completed without recurrence.

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Conflict of Interest

The authors declare no conflicts of interest.

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چکیده

هدف از این مطالعه، گزارش نتایج بالینی و آسیب‌شناسی یک تومور همارتوم عروقی لثه در یک گوساله و ارزیابی نتایج درمان بود. یک گوساله ماده ۳ ماهه از نژاد سیمنتال با شکایت وجود یک توده در ناحیه دندان پیشین نخستِ فک پایین به بخش جراحی دام‌های بزرگ دانشکده دامپزشکی دانشگاه شهید چمران ارجاع شد. صاحب گوساله گزارش کرد که ضایعه از هنگام تولد وجود داشته و در هنگام تغذیه موجب خونریزی می‌شده است. همچنین صاحب حیوان بخشی کوچک از ضایعه را جدا کرده بود که باعث خون‌ریزی شدید شده بود. در معاینه بالینی، یک توده بیضی‌شکل به اندازه یک آلو (۳۰×۲۰×۵ میلی‌متر) بر سطح دندان‌های پیشین فک پایین مشاهده شد. این توده به لثه متصل بود و یکی از دندان‌های پیشین را به جلو رانده و از محور طبیعی خود خارج کرده بود. پس از بی‌حسی موضعی، توده به طور کامل با عمل جراحی برداشت شد. در حین جراحی، خون‌ریزی قابل توجهی مشاهده گردید و مشخص شد که یک ریشه دندان شیری درون توده وجود دارد که خارج شد. ناحیه جراحی با نخ نایلون بخیه شد. پس از عمل، هیچ‌گونه مشکل تغذیه‌ای در گوساله مشاهده نشد. بر اساس بررسی‌های آسیب‌شناسی، توده به عنوان یک همارتوم عروقی تشخیص داده شد. تومورهای همارتوم عروقی لثه در گاو نادر هستند.

کلمات کلیدی: همارتوم عروقی مادرزادی، گوساله، نژاد سیمنتال، پاتولوژی

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