Case report

In search of an appropriate clinical diagnostic term with indefinite etiology. A case series on lobular capillary hemangioma

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Lobular capillary hemangioma, a benign vascular tumor of the skin or mucous membranes characterized by rapid growth and a friable surface, is widely but inappropriately termed pyogenic granuloma (now considered a misnomer by some theories) due to lack of evidence for infectious etiopathogenesis. Some studies promote the theory of a hyperplastic, neovascular response to an angiogenic stimulus with imbalance of promoters and inhibitors.

Here we present a series of 4 cases of patients who visited the Oral Medicine OPD with a complaint of similar painless malformations showing granulomatous and/or fibrous tissue proliferation and which, after thorough history taking, clinical examination and excisional biopsy, were revealed to be lobular capillary hemangioma under histopathologic diagnosis.

The following discussion revolves around the fact that, even though such exophytic lesions may present with variable features, a proper, accurate and logical diagnostic entity may be used to help in better coordination among the oral physician, oral pathologist and oral surgeon in framing the desired treatment plan.

Key words: lobular capillary hemangioma, pyogenic granuloma, angiogranuloma.

Introduction

Lobular capillary hemangioma (LCH) is a benign vascular neoplasm or tumor of the skin or mucous membranes characterized by rapid growth of variable size and shape and a friable surface, which shows increased occurrence towards the head and neck region [1]. Intra-orally labial mucosa, gingiva, tongue, and buccal mucosa are the common sites of occurrence. It shows higher prevalence in the 2nd and 5th decades of life [2]. Even though there is no specific established etiology, some theories suggest a hyperplastic, neovascular response to an angiogenic stimulus with imbalance of promoters and inhibitors [3]. These proliferative growths are distinct from other vascular malformations or true hemangiomas, since they are considered as reactive lesions and display a clear cause-effect relationship, having significant mitotic activity and similar microscopic appearance but varied clinical presentation.

Here, a series of 4 cases are presented where the patients reported to our Oral Medicine OPD with the chief complaint of a mass or growth, having different morphological features but similar histopathological findings.

Case 1

A 65-year-old female patient reported with a complaint of mass growth on her right buccal mucosa for the past 1 month.

History revealed that initially, around 2 months ago, the lesion appeared in her right cheek as a small, painless, nodular growth, pink in color, which later increased in size, starting 1 month ago, along with reddish discoloration, until the present condition. The growth caused discomfort while chewing food and occasional episodes of bleeding occurred.

Past medical history was insignificant.

The patient has a habit of tobacco and pan chewing since 15 years ago.

Intra-oral examination findings

The right buccal mucosa on inspection showed an irregular nodular/lobulated soft tissue mass of approximately 4 × 3 cm in size with mixed areas of erythema, pink and yellowish discoloration, superiorly extending from the level of maxillary premolars' alveolar ridge to the occlusal surface of 46 inferiorly, mesiodistally extending from the distal aspect of 14 to the 47 region. The patient had a poor periodontal status with severe calculus and plaque deposition, gingival recession, teeth mobility and generalized attrition with sharp cuspal edges (Fig. 1A).

On retraction of the mucosa and palpation, the soft tissue mass showed profuse bleeding, rubbery in consistency and non-tender in nature. The lesion also showed indentation markings of the offending tooth, causing trauma. The lesion was movable, having a pedunculated base. A hyperkeratotic soft tissue beak with yellowish discoloration was observed (Fig. 2B).

A provisional diagnosis of irritation fibroma was given, following which excisional biopsy was performed under LA (Fig. 2B), with successful achievement of hemostasis, in our OPD setup, and a sample was submitted for histopathology confirmation, which suggested LCH as the diagnosis.

Case 2

A 56-year-old male patient presented with a complaint of a growth inside his right cheek since 1 month ago. History revealed a similar presentation as described in the previous case. No relevant medical history was reported on query. Lifestyle evaluation revealed that the patient had an occasional gutkha and pan masala chewing habit, 3–4 times a week for 15 years. The habit had been stopped since the growth of the lesion. In this case as well, poor periodontal health was evaluated on intra-oral examination (Fig. 2A).

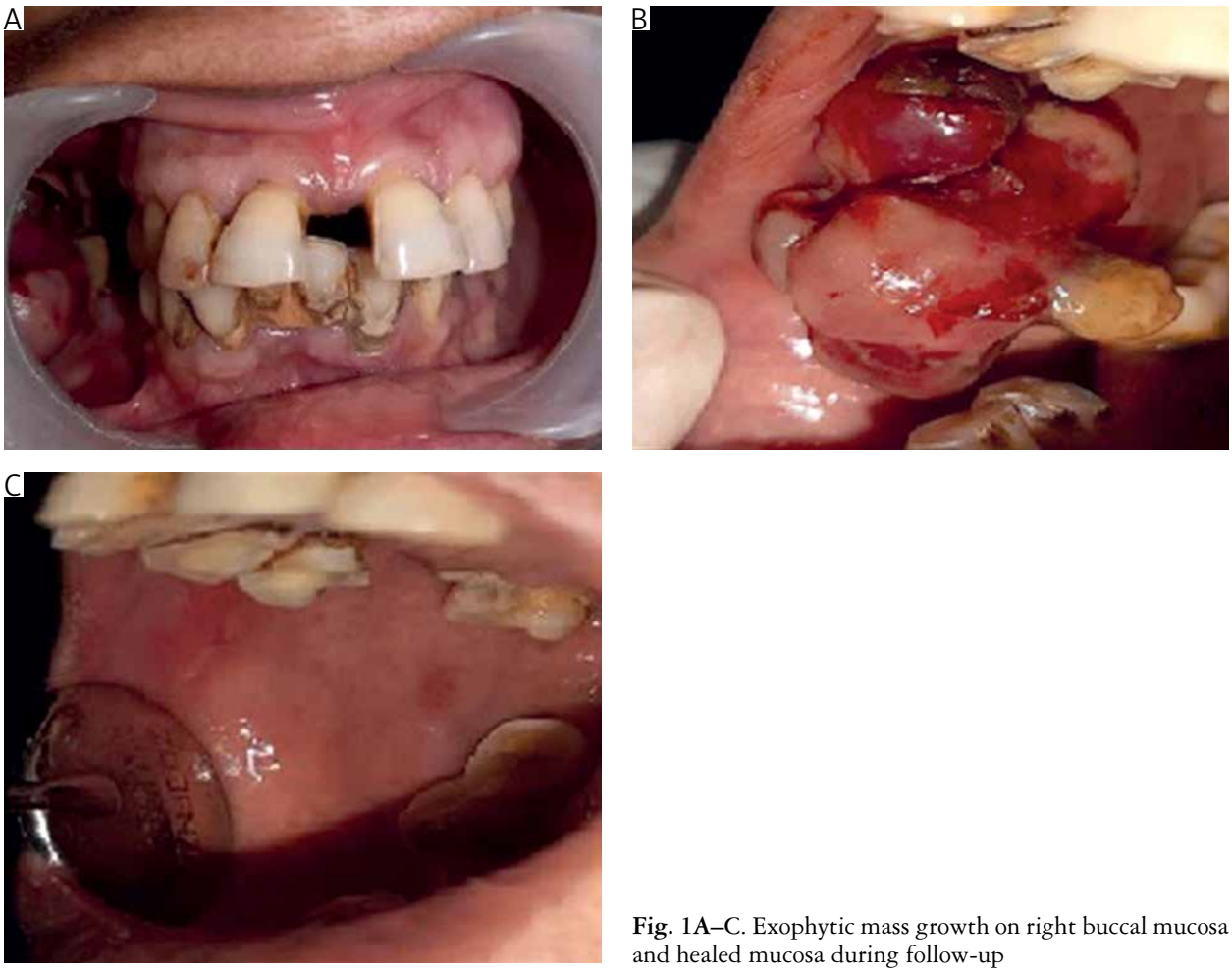

Fig. 1A–C. Exophytic mass growth on right buccal mucosa and healed mucosa during follow-up

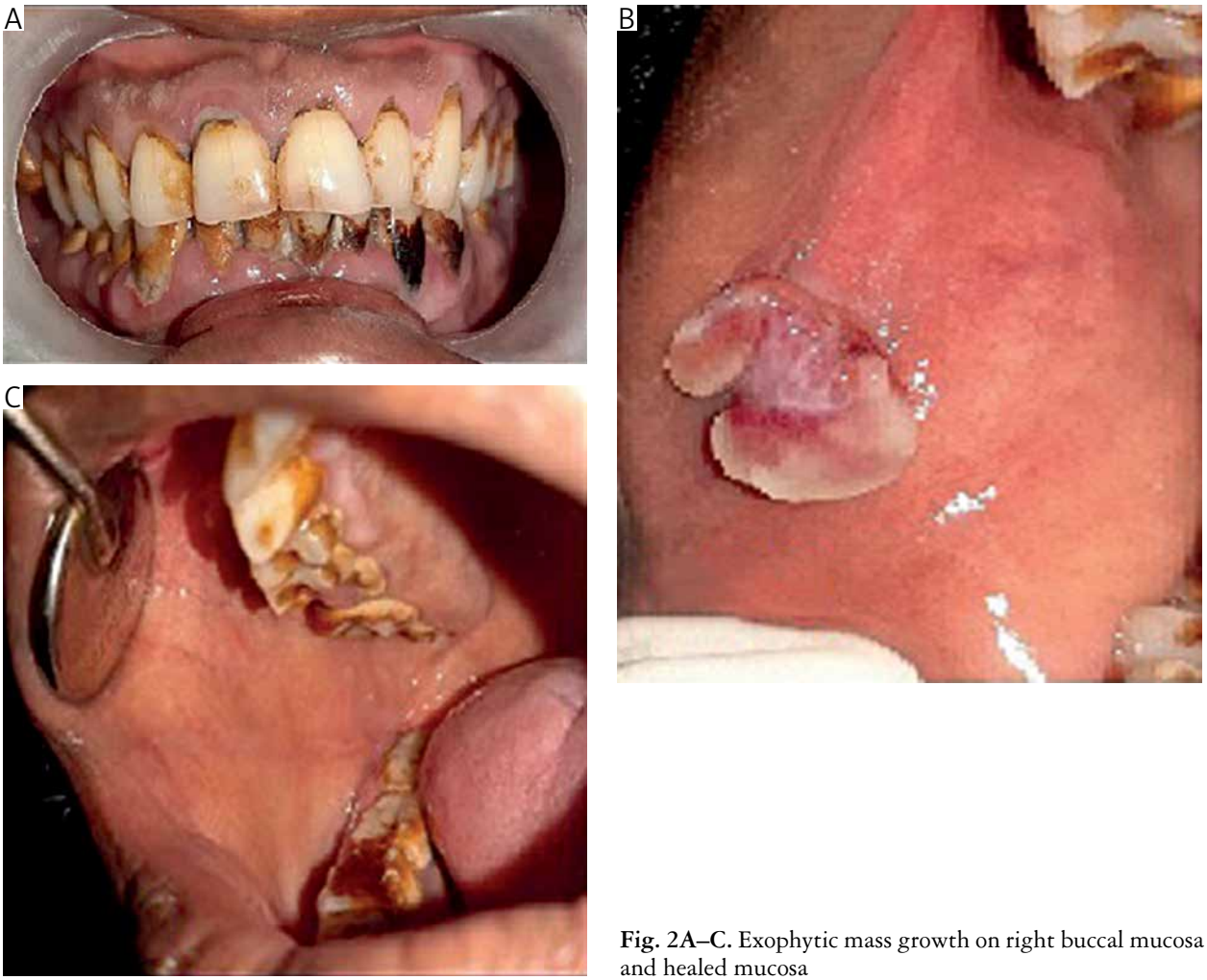

Fig. 2A–C. Exophytic mass growth on right buccal mucosa and healed mucosa

Intra-oral examination findings

On inspection of the right buccal mucosa, a single, irregular bean-shaped soft tissue exophytic mass of approximate size 1.5 × 2 cm with mixed appearance of erythema, whitish and normal mucosa color having a well-demarcated border was evident towards the anterior aspect 1 cm inferior to occlusal level i.r.t 14, 15, and 1 cm posterior to the lip commissure. The center of the lesion appeared to be depressed and showed area of keratinization. Surrounding mucosa appeared to be normal.

On retraction and palpation, the soft tissue mass revealed a soft consistency, painless in nature and movable, having a pedunculated base. The surface of the lesion appeared to be irregular and lobulated with an indentation mark (Fig. 2B). Mild hemorrhage on provocation was observed.

Following a provisional diagnosis of ***irritation fibroma***, excisional biopsy was performed under LA and a tissue sample submitted for HP confirmation which revealed LCH as the diagnosis.

Two more lesions (Fig. 3, 4) in patients of different ages with similar presentation on different sites were examined and later sent for histopathology study and

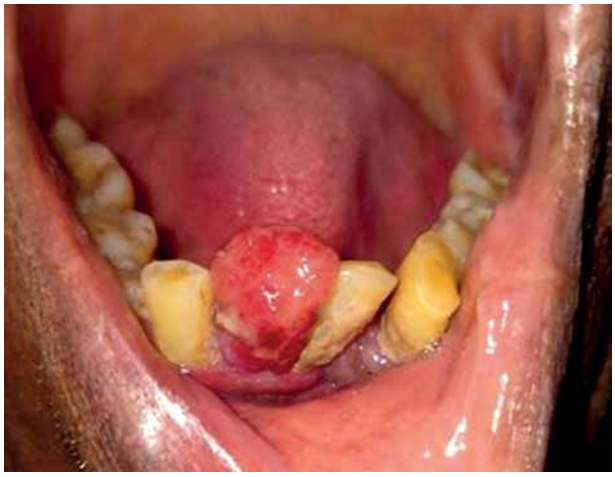

Fig. 3. Epulis involving the attached gingiva in relation to the lower anterior region

the reports revealed similar microscopic features and diagnosis.

Discussion

In the International Society for the Study of Vascular Anomalies (ISSVA) classification system of vascu-

Fig. 4. Pyogenic granuloma involving the maxillary posterior region on the right side

lar anomalies, revised version of May 2018 (approved at the 20th ISSVA workshop in Melbourne), the relatively new entity of LCH was identified as a benign vascular tumor of acquired origin, which is categorized separately from the true hemangiomas (infantile) [4, 5]. These lesions may mimic other diagnostic entities both clinically and histopathologically and often cause a dilemma for the concerned clinician to arrive at an accurate diagnosis.

While the highest incidence of oral lobular capillary hemangiomas is found in the second and fifth decades, these masses occur in patients of all age groups with equal gender predilection. Clinical features remain non-specific with a slow or rapid phase of proliferation into exophytic polypoid masses, hemorrhage on provocation, and surface ulceration with or without extensive fibrosis. While few of them show spontaneous regression or involution during the early stage of occurrence, others generally grow to a considerable size and even recur following surgical excision. The term pyogenic granuloma is considered a misnomer because the lesion is not associated with pus formation and does not show a true granulomatous histopathology picture [6, 7].

As mentioned earlier, the etiology of LCH remains unknown, although bite trauma, fractured tooth, poor restorations, chronic local irritation, hormonal factors, poor oral hygiene, and medications may play a role in the development of these lesions. Here in all 4 cases, patients had poor periodontal health along with generalized attrition and sharp cuspal edges, which may also be a precipitating factor.

In an extensive review of 600+ vascular lesions of the oral cavity, Mills *et al*. found around 73 cases of oral LCH that showed characteristic findings consistent with the diagnostic criteria. The lip is the most common site (38%), followed by the nose (29%), oral mucosa (18%), and tongue (15%) [8].

The imaging features of LCH are non-specific but dystrophic calcifications may be viewed in some long-standing cases. USG is considered as the standard and desired mode of imaging if required, where it shows a well-circumscribed, hypoechoic mass under grey scale imaging.

In the light of molecular biology, LCH remains different from other vascular neoplasms due to its increased mitotic activity. Increased levels of common molecular signaling contributions to endothelial cell migration and new vessel development have been discovered during the proliferative phase of growth such as vascular endothelial growth factor, basic fibroblast growth factor, insulin-like growth factor, and matrix metalloprotease-9. Similarly, and as would be expected, the levels of angiogenic markers also wane during the involution phase of hemangiomas (Buckmiller *et al.,* 2010).

Hence, in view of the above discussed clinical features and histopathological findings of the lobular pattern of highly proliferative blood vessel and chronic inflammatory cell infiltrate, LCH was confirmed as the diagnosis. Under the clinical scenario, differential diagnosis of epulis granulomatosa (EG), peripheral ossifying fibroma (POF), or peripheral giant-cell granuloma has been mentioned. Epulis granulomatosa presents as a smooth or lobulated exophytic lesion with pedunculated or sessile base. The surface color ranges from pink to red or purple, depending on the duration of the lesion. Epulis granulomatosa is a vascular lesion characterized by granulation tissue growth in a recently extracted tooth socket [9]. The tissue growth represents a response to the presence of bone spicules or tooth fragments, thus resulting in the formation of granulation as a way of trying to repair or cure the injured site. Therefore, EG is an inflammatory reaction [10, 11]. So in this case the location or site of occurrence of the lesion is an important differentiating criterion. Clinically POF presents as a smooth lobulated pink mass, firm in consistency, on a pedunculated or sessile base. It has an increasing incidence in the second decade and declining incidence after the third decade [12]. Only 0.5% of cases are reported in the older age group [13]. There is a female predilection for the lesion due to the hormonal influences [14]. But these lesions are mostly present on the gingiva in close association with the teeth, being thought to arise from the periodontium. Peripheral giant-cell granuloma occurs throughout life, with higher incidence during the mixed dentition stage [15] and also within the age range of 30–40 years, associated with a higher female predilection (60%) [16, 17]. Other important differential diagnostic entities are conventional capillary hemangiomas, Kaposi's sarcoma, and bacillary angiomatosis clinically. Similarity is mainly observed in the younger LCH lesions [18, 19]. Histopathologically, the absence of atypical cells and bizarre vascular

channels helps to differentiate pyogenic granuloma from Kaposi's sarcoma, whereas absence of any granular bacterial material differentiates it from bacillary angiomatosis [20]. Other differential diagnoses that may raise a red flag while diagnosing LCH and similar lesions are amelanotic melanoma, angiosarcoma, irritated melanocytic nevi, granulation tissue from minor trauma or scratching, angiolymphoid hyperplasia with eosinophilia and acquired tufted angioma. The probable complications of LCH that may be encountered are ulceration, secondary infection and hemorrhage from trauma to the lesion.

Since these lesions mostly display a reactive pattern of development under the influence of local/systemic factors in association with angiogenic proliferation and partial granulomatous changes, the term reactive angiogranuloma [21] (with or without fibrosis) can be coined as a clinical diagnosis, when encountered, instead of pyogenic granuloma, unless an infectious etiopathogenesis can be established, or fibroma/epulis, which is more of a generalized term without a clue to the lesion's characteristics. Due to its vascularity, the term "telangiectatic granuloma" has also been proposed by certain authors [22].

Regarding the treatment, the most common approach is surgical excision under LA. In the above-mentioned cases uneventful hemostasis was achieved within a short duration and complete healing of the buccal mucosa is observed (Figs. 1C, 2C). A possible reason is that even though it is a vascular lesion, following its chronicity resulting in extensive fibrosis, the initial active phase of angiogenesis enters into quiescence. So such lesions can be managed by the oral physician, on a regular basis in the OPD set-up, without a sophisticated armamentarium except special circumstances.

Conclusions

The discussion revolves around the fact that, even though such exophytic angio-proliferative lesions may present with variable features, a proper, accurate and logical diagnostic entity may be used, in this case *reactive angiogranuloma*, which should be accepted universally to eliminate further confusion, avoid multiple diagnostic terminologies and help in better co-ordination among the oral physician, oral pathologist and oral surgeon in framing the desired treatment plan.

The authors declare no conflict of interest.

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