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Identification of a Giant Cell Fibroma

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Fibrous hyperplastic connective tissue lesions are common in the oral cavity and may be similar both clinically and histologically. A giant cell fibroma, a type of fibrous hyperplasia, was discovered during a preventive patient visit in the dental hygiene clinic at a Midwestern university. The patient, a 19-year-old female, presented with a dome-shaped lesion of normal mucosal color on the attached gingiva apical to tooth number 11. She was referred to the dental school for biopsy, which revealed fibrocollagenous connective tissue exhibiting large stellate fibroblasts. She returned after 10 months and was referred to the graduate periodontal department, where the lesion was removed. Several fibrous hyperplastic lesions can be considered in the differential diagnosis of giant cell fibroma. Dental hygienists should be familiar with the different fibrous hyperplasias, noting lesions during the intra- and extra-oral examinations for further evaluation by the dentist.

Keywords: Fibrous hyperplasias, giant cell fibroma, oral lesions

Introduction

Fibrous hyperplastic lesions of the oral cavity are very common and are manifested in various locations. Fibrous hyperplasias are generally considered to be reactive in nature rather than neoplastic; they are simply the overgrowth of tissue in response to a stimulus. Many times, the stimulus is chronic irritation. Until the early 1970s, the giant cell fibroma (GCF) was one among this group of similar lesions referred to as fibrous hyperplasias, fibroepithelial polyps, or, simply, fibromas. Since then, clinical and histologic features have enabled pathologists to classify a number of these lesions as separate entities, although they may share common characteristics. The following case study concerns one of the lesions in the group, the GCF.

Review of the Literature

History of the Giant Cell Fibroma

The GCF was first described as a separate entity among fibrous hyperplastic soft tissue lesions by Weathers and Callihan in the early 1970s. It was named for its characteristically large, stellate-shaped, mononuclear and multinucleated giant cells.[1] The authors examined more than 2,000 specimens in a group of fibrous hyperplasias, and 108 met their criteria for

this "new" lesion which they called GCF. Before Weathers' and Callihans' distinction of GCF, Eversole and Rovin compared and contrasted 279 fibrous hyperplastic gingival lesions, which fell into four categories: pyogenic granuloma, peripheral gingival fibroma, peripheral giant cell granuloma, and peripheral ossifying fibroma. Each has its own diagnostic histopathologic characteristics but exhibit overlap of clinical presentation. Speculations from the study were that all four types of lesions are merely varied histologic responses to common etiologic factors,[2] but similar to one another and to other fibrous hyperplasias.

After distinguishing GCF among fibrous hyperplasias, Weathers and Campbell further elucidated the structure of the lesion when they studied them under light microscopy. They concluded again that dominant cells in the GCF were indeed unique, and that GCF merited its own classification.[3] In the following few years, reports appeared in the literature about other lesions with the same types of cells in extra-oral sites, such as the nose and glans penis. In 1982, Houston completed a retrospective study of 464 GCFs from files at the Indiana University School of Dentistry and agreed that this GCF was indeed a distinctive lesion.[4]

Not all of those involved in oral pathology, however, agreed with Weathers' and Callihans' description of the diagnostic features for GCF. Conclusions from a study by Reibel,[5] as well as one by Savage and Monsour,[6] disputed the distinction of the lesion as a separate entity among fibrous hyperplasias and tumors. Reibel reveiwed 1,550 cases of oral fibrous hyperplasias containing stellate and multinucleated cells. He concluded that, due to the varying nature of the lesions and different ages at which the stellate and multinucleated cells are found, the so-called GCF should not be considered as belonging to a separate entity. In addition, Savage and Monsour retrospectively reviewed the histologic features of all lesions designated as fibrous or fibroepithelial polyps over a 10-year period from an oral biology and oral surgery department of an Australian university. They concluded that the histologic features were not sufficiently unusual or characteristic in normal or pathologic tissues to warrant grouping the lesions as a separate and distinct entity.

In spite of discrepancies about its distinction, American authors apparently have adhered to the separate designation because GCF is currently described as a separate entity in oral pathology textbooks.[7, 8, 9, 10, 11, 12] Further investigation over the years has led to the belief that the GCF is simply a histologic variant of focal fibrous hyperplasia, or irritation fibroma, the most common reactive connective tissue lesion in the oral cavity.[7] However, as recently as 1996, authors of a study in the United Kingdom noted that it was unclear if the GCF was a distinct entity or a variant of the fibroepithelial polyp.[13] In another study shortly thereafter, the same authors found reason to believe there was a distinct difference between the two.[14] Variant of another lesion or otherwise, the GCF will be discussed in this case study as first defined by Weathers and Callihan.

Etiology

Fibrous hyperplasias are considered reactive proliferations of fibroblastic tissue rather than neoplastic proliferations.[7] Most are the result of chronic injury or irritation. GCF was at one time hypothesized to be virus-induced,[5] but that claim was never substantiated; therefore, it is believed to arise as a result of a stimulus, the source of which cannot always be determined.[11]

Clinical Features

There is no gender predilection for GCF, but it is a lesion of the young, found most commonly in the first three decades of life.[1, 4, 6] It presents clinically as an asymptomatic raised lesion, one centimeter or smaller in diameter.[1, 4] Most GCFs have a bosselated or pebbly surface,[1] which can result in a clinical misdiagnosis of papilloma.[1, 8, 9, 15] It may be pedunculated or sessile and is found most commonly on the gingiva, with the mandibular gingiva being affected more than the maxillary.[1, 4, 8, 15] (Figure 1) It may also be found in extragingival sites, including the tongue, palate, and buccal mucosa.[1] It is typically of normal mucosal color unless traumatized during mastication or oral hygiene procedures.[1,4]

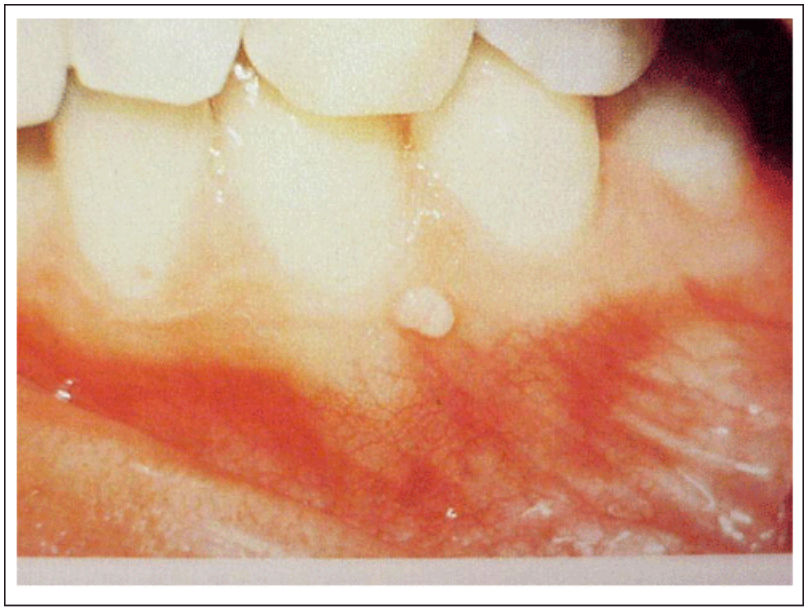

Figure 1. Giant cell fibroma, mandibular anterior attached gingiva of a 27-year-old male
(Photograph used with permission from *RDH*)

Histology

The histologic composition of GCF is the consistent diagnostic feature of the lesion.[6, 15] Microscopic examination reveals multiple large stellate-shaped and sometimes multinucleated fibroblasts (giant cells) in a loosely arranged vascular fibrous connective tissue.[1, 3, 4, 5, 6, 8, 10] These cells have oval nuclei with abundant eosinophilic cytoplasm and are most copious just under the epithelium, but they may also be distributed throughout the lesion.

Treatment

The treatment of choice for the GCF is conservative surgical excision.[7, 8, 9, 10, 15] GCF seldom recurs, nor does it regress spontaneously because the excess collagen in the lesion is permanent tissue.[7, 8, 9] Periodontal root planing is also suggested during excision to remove possible sources of irritation.[7, 10, 11]

Patient History

A 19-year-old female presented for oral examination and prophylaxis in the dental hygiene clinic at a Midwestern university. She was in good general health with no significant findings on the medical history. Dental history revealed only sporadic previous dental care. Oral examination revealed moderate generalized plaque and calculus, with light staining from tobacco. An incidental finding during oral examination was a firm, asymptomatic, 1 x 0.5 cm dome-shaped lesion of normal mucosal color on the facial surface of the attached gingiva apical to tooth #11 (Figure 2). Radiographs were not exposed at this visit, and the patient was reappointed for preventive care and the necessary radiographs. She did not, however, follow up with subsequent appointments.

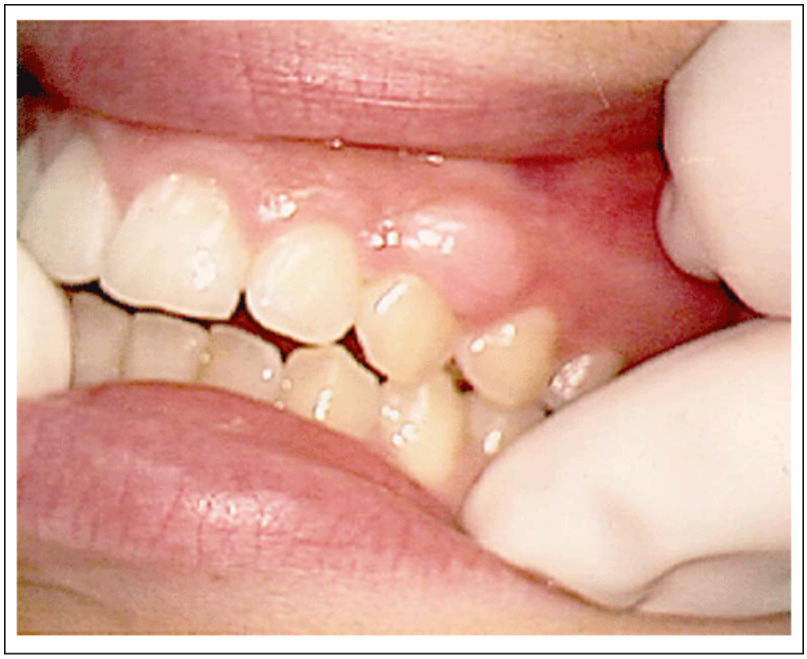

Figure 2. Case study patient, first recognition of lesion

Three years later the patient returned to the clinic, seeking preventive care. She had received no dental care in the interim and was now four months pregnant. Oral conditions were similar to her previous visit, but she was now concerned about the appearance of the dome-shaped lesion on the maxillary facial gingiva detected during the previous examination. It now measured 1.4 x 0.8 cm, extended to the mid-facial of the adjacent teeth, and exhibited greater buccal expansion (Figure 3). Because she was pregnant, the patient requested no radiographs. She completed preventive care but wished to wait and seek treatment for the lesion post-partem. Financial constraints prohibited referral to a local oral surgeon, so she was referred to the university's dental school-a two-hour drive from the dental hygiene clinic-for evaluation and treatment of the lesion.

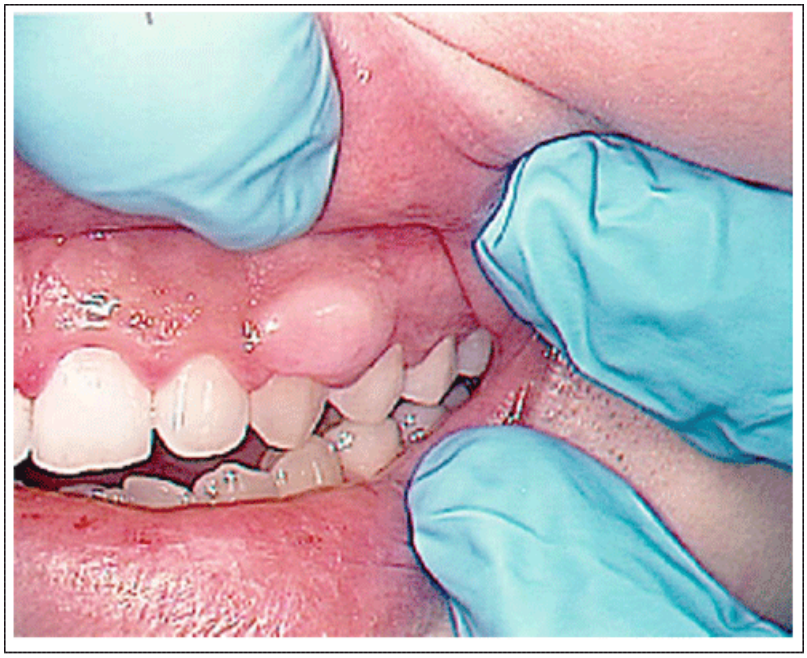

Figure 3. Case study patient, three years later

After delivering a healthy baby boy, the patient again returned to the dental hygiene clinic for preventive care the following year. She reported that the lesion noted at the two previous visits seemed to increase in size during her pregnancy. It had since been biopsied at the dental school but had not been totally excised (Figure 4). Per her request, a follow-up report was received from the dental school for her records in the dental hygiene clinic, as it remained her primary source of dental care. The report stated that radiographs of the lesion exposed at the dental school were unremarkable, and the clinical diagnosis was ossifying fibroma. The lesion was biopsied in the oral surgery department and submitted for histologic evaluation. A note was included about a grainy or gritty feel to the lesion during excision. The pathology report revealed parakeratinized stratified squamous epithelium on the lesion's surface. The submucosa was composed of fibrocollagenous connective tissue exhibiting large stellate fibroblasts. Diagnosis by the pathology department was GCF.

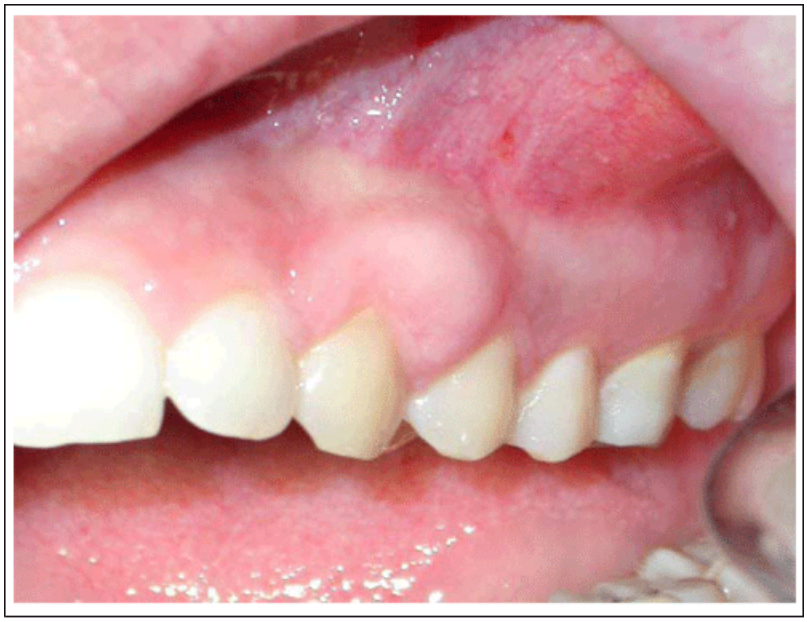

Figure 4. Case study patient, 10 months after biopsy

The patient did not return for post-operative evaluation at the dental school until 10 months after the biopsy. There remained what was noted as a "swelling" in the area of teeth #s 10, 11, and 12. Complete excision of the fibroma was advised. Due to aesthetic concerns about gingival contour, she was referred to the graduate periodontal department where the lesion was fully excised (Figures 5, 6, 7, 8, 9). A second pathology report was requested with a diagnosis of "consistent with focal fibrous hyperplasia-gingiva." The patient was informed about the fibroma's possible recurrence, which might require extractions and ostectomy. At post-operative visits she expressed concern about the apically positioned gingival margin and the aesthetic difference when compared to the right side. Discussions were started about possible gingivoplasty after healing. The patient again requested release of information to the dental hygiene clinic and is contacted for routine recall appointment.

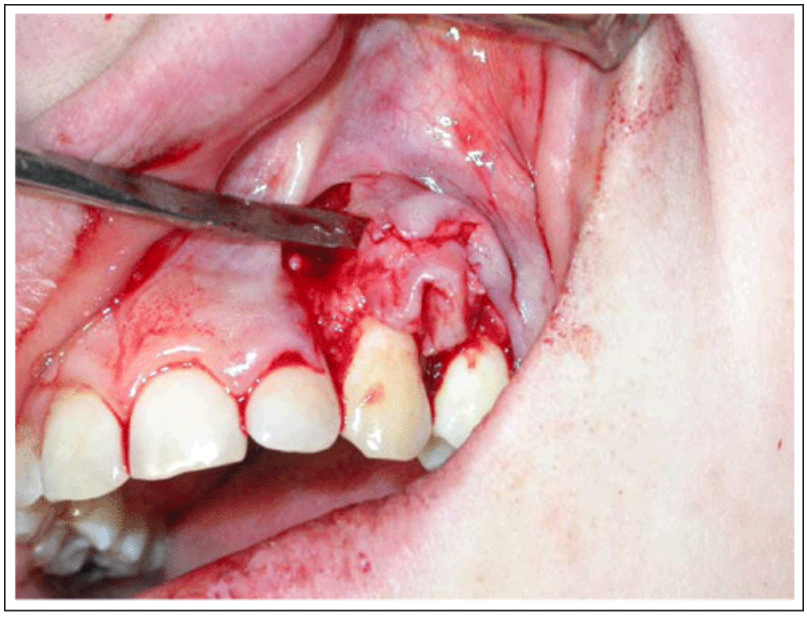

Figure 5. The surface epithelium is reflected, exposing the underlying connective tissue.

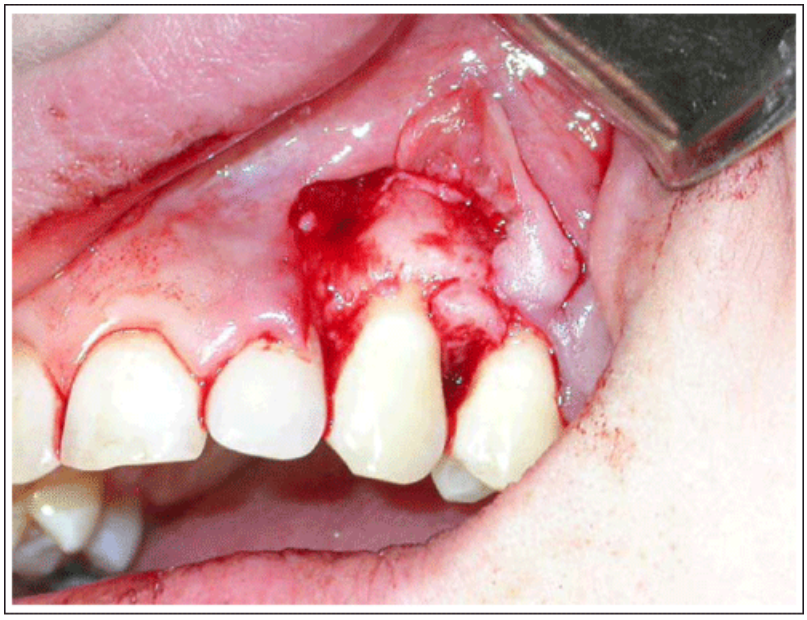

Figure 6. The connective tissue lesion is excised and submitted for histologic examination and diagnosis

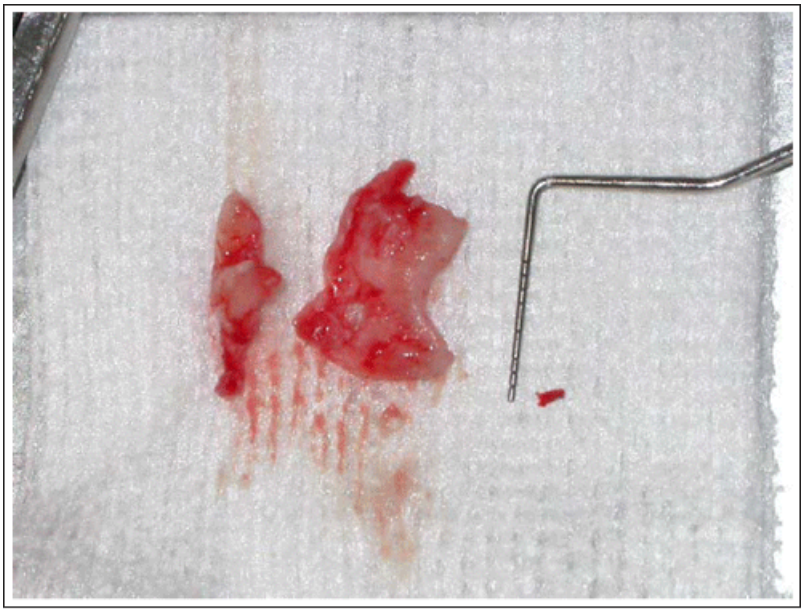

Figure 7. The fibroma after excision measuring >10mm

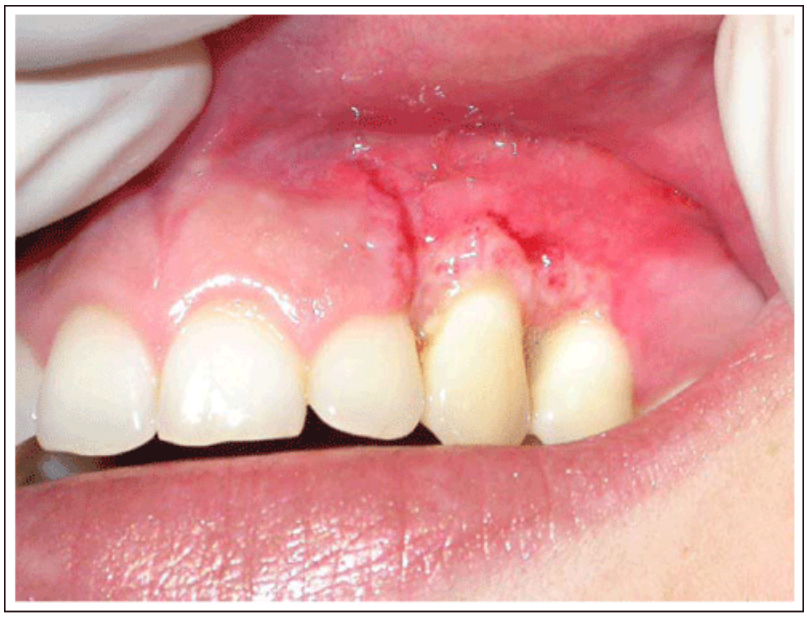

Figure 8. One week post-op

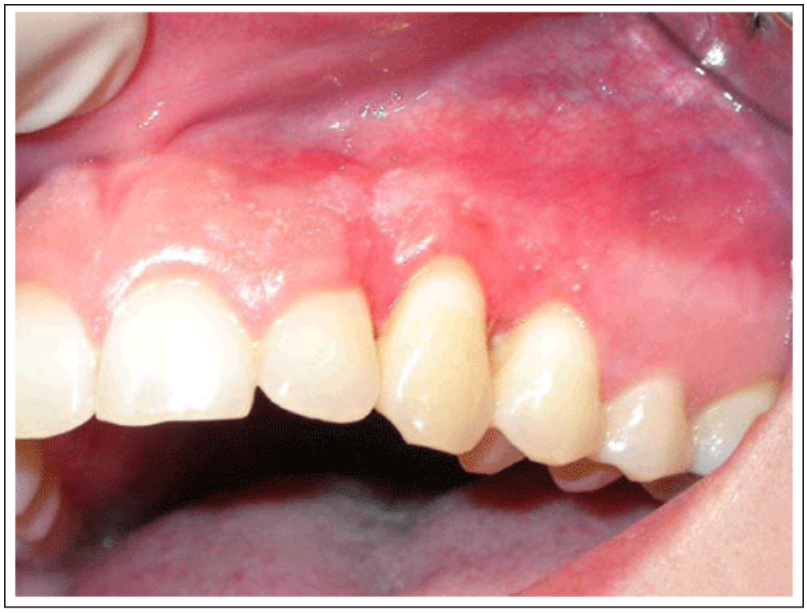

Figure 9. Three weeks post-op. Note the position of the marginal gingiva, apical to the CEJ, tooth # 11

Discussion

As evidenced in this case study, and in diagnosing lesions in general, both clinical and histologic features are important in determining a final diagnosis.[16] Though the GCF is very similar histologically to other fibrous hyperplasias, clinical features may aid in dintinguishing it from other lesions.[7] Several lesions should be included in the differential diagnosis and, only after all diagnostic characteristics are considered, a final diagnosis rendered.

In spite of similar histology, several distinctions can be made between a number of fibrous hyperplasias according to characteristics such as age distribution, gender predilection, location and etiology.[10] GCF usually develops sometime in the first three decades of life, whereas irritation fibroma, possibly the lesion most similar to GCF, is found in older adults, in the fourth to sixth decades. Irritation fibroma is also found more in females (2:1), while GCF is generally considered to have no gender predilection. As for location, the irritation fibroma is located more commonly on the buccal or labial mucosa along the line of occlusion, as opposed to the gingiva for GCF (Figure 10).

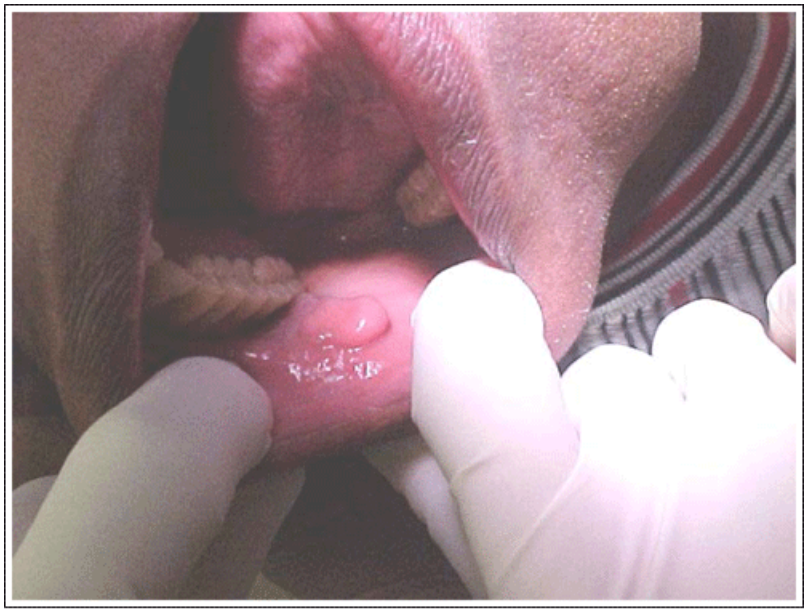

Figure 10. Irritation fibroma on the buccal mucosa of a middle-aged male

Location is a diagnostic characteristic of another histologically similar lesion as well, the retrocuspid papillae (Figure 11). Some sources define it as merely another form of GCF,[8, 10] but the retrocuspid papilla has a very characteristic location on the mandibular lingual attached gingiva, inferior to the canine. It is a small, pink papule measuring up to 5mm and is frequently bilateral.[8] The retrocuspid papilla is considered by some to be developmental[7, 8, 16] and, due to its clinical appearance and characteristic location, does not warrant biopsy, whereas irritation fibroma and GCF both require biopsy for definitive diagnosis.[8]

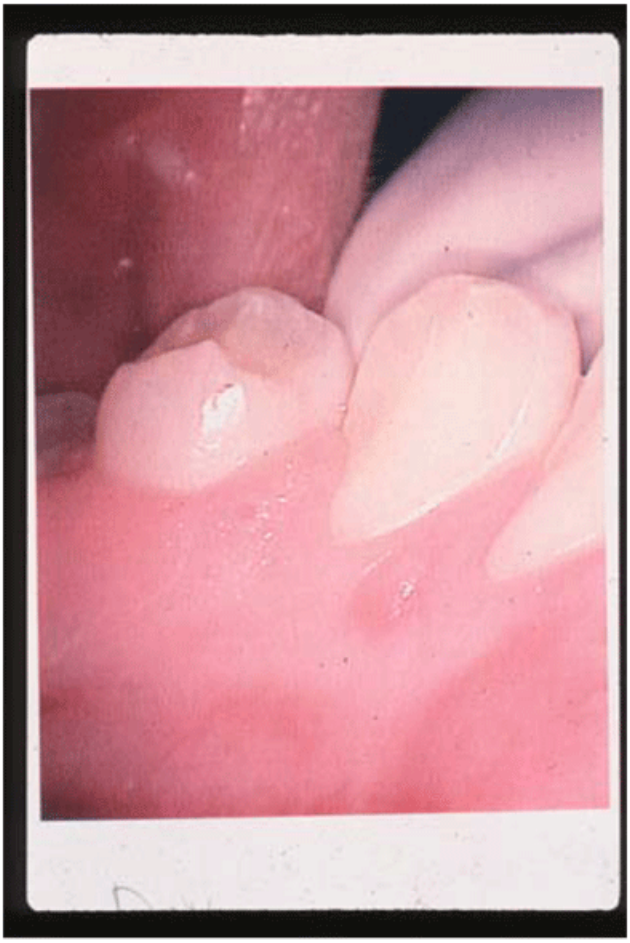

Figure 11. Retrocuspid papilla in a young female college student

The clinical diagnosis of ossifying fibroma was a logical inclusion in the differential diagnosis of this lesion, as it can look much like the GCF clinically.[15] (Figure 12) Ossifying fibromas are typically normal mucosal color like GCFs, but they have islands of osteogenic cells dispersed throughout the lesion.[7, 8, 9, 10] Unlike GCF, peripheral ossifying fibroma is found only in the gingiva, occurs more in females, and is thought to arise from the periodontal ligament.[7, 8, 9, 17] Like GCF, it is found more in young adults and recommendations for excision include periodontal root planning.[7, 8, 9] The gritty or grainy feel noted during the biopsy may have also reinforced the surgeon's original impression concerning the type of lesion being excised. The clinical diagnosis was not likely to have been papilloma, which is a common misdiagnosis of GCF. Most have a bosselated or papillary surface, but this was merely a smooth, round, sessile enlargement of the attached gingiva.

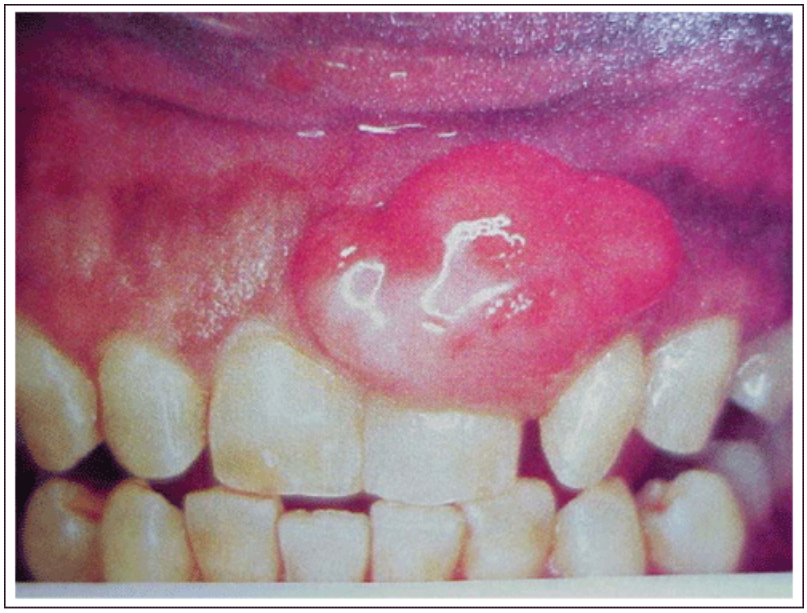

Figure 12. Ossifying Fibroma, maxillary anterior
(Photograph used with permission from *RDH*)

Color and vascularity of lesions can also be distinguishing features when diagnosing fibrous hyperplasias. Most irritation fibromas are of normal mucosal color, unless traumatized, in which the lesion could appear reddened, or whitish due to hyperkeratinization, the result of continued irritation after development of the lesion. Pyogenic granuloma, on the other hand, is commonly found on the gingiva (like GCF), but tends to be red[7] and bleeds easily if manipulated,[8] unlike most GCFs and the lesion in this case study (Figure 13). It was of normal mucosal color and had no associated bleeding. Had the patient first visited the clinic during her pregnancy, it is conceivable that the lesion could have been mistaken for a pyogenic granuloma, which is commonly found on the gingiva of pregnant women and, if a mature lesion, can be pink instead of red.[8] It is interesting, however, that she perceived the lesion to increase in size during her pregnancy.

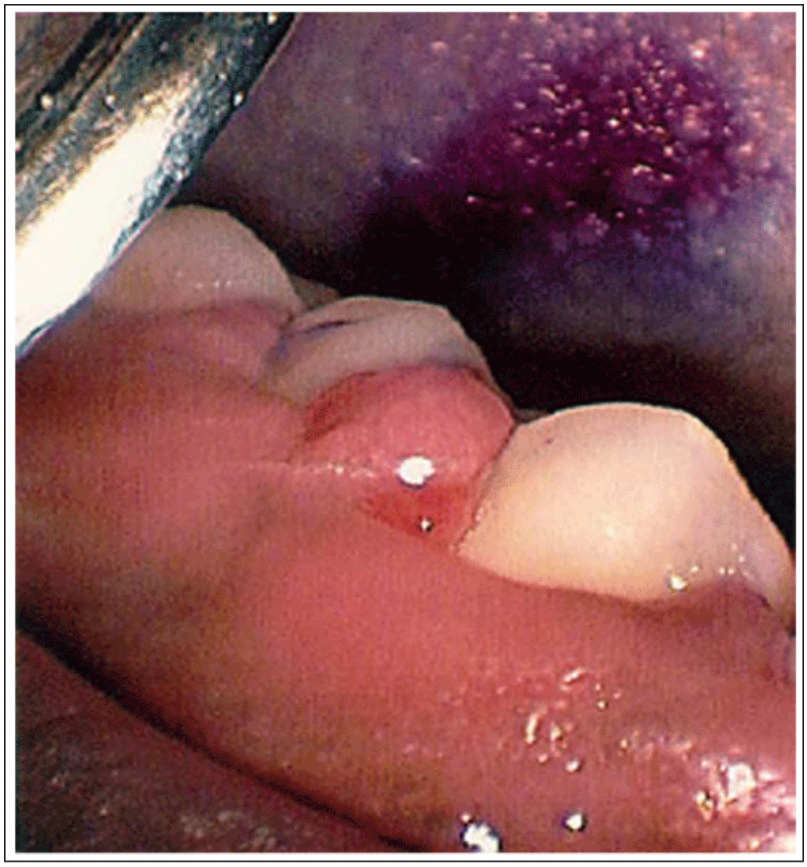

Figure 13. Pyogenic granuloma, interdental papilla area, #'s 28 & 29

Although most fibrous hyperplasias are relatively innocuous lesions, histologic examination of the tissue is necessary in most cases to rule out the possibility of malignancy. Though they are not considered true tumors, fibrous hyperplasias may continue to increase in size until the stimulus or irritation is removed or the lesion is excised. The patient in this case study was a smoker, a trait which places her at greater risk for oral cancer, making early diagnosis more paramount. The delay in complete excision of the lesion may have required more extensive surgical intervention than if the patient had returned for post-operative visits following the initial biopsy.

Conclusions

Several fibrous hyperplastic lesions are similar both clinically and histologically, requiring biopsy for definitive diagnosis. Dental hygienists should be familiar with the different types of fibrous hyperplasias they may encounter during patient treatment and should note such lesions for further evaluation by dentists.

As demonstrated in this case study, GCFs may continue to proliferate until completely removed. A case can be made for early recognition and treatment of lesions to minimize surgical intervention.

Acknowledgements

Notes

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