

PERIODONTAL PLASTIC SURGICAL REPAIR FOLLOWING REMOVAL OF A RECURRENT PERIPHERAL ODONTOGENIC FIBROMA

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Abstract

The purpose of this case report was to present a case of a recurrent peripheral odontogenic fibroma, which required periodontal plastic surgery, due to resultant esthetic complications.

This report describes a case of removal and biopsy of a large gingival lesion over the left maxillary central incisor, which recurred, thus requiring more aggressive treatment, followed by esthetic periodontal plastic surgery. After fourteen months, there was uneventful healing of the gingival and alveolar tissues with no further recurrence noted. The attempt to create satisfactory esthetics was achieved in cases where aggressive surgery may be necessary.

The peripheral odontogenic fibroma should be removed entirely, due to its high propensity for recurrence. Attempts at regeneration and cosmetic enhancement may create a more satisfactory outcome for the patient in cases where aggressive surgery may be necessary.

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Introduction

The peripheral odontogenic fibroma (POdF) has been defined in the WHO classification as a peripheral odontogenic tumor representing the extraosseous counterpart of the central odontogenic fibroma.¹ Peripheral odontogenic fibroma (POdF) is a rare benign neoplasm. It is normally represented as a sessile, painless and smooth-surfaced mass in the gingival region and it is conceived as the mucosal analogue of central odontogenic fibroma. The histological aspect consists in a proliferation of fibromyxomatous connective tissue with odontogenic epithelium (quantity may vary) and occasionally presents sites of calcification (dentinoid, cementicles or osteoid). This type of

lesion is more frequent in patients between the second to fourth decades of life. The incidence in the lower jaw is higher, with the anterior and pre-molar regions being the most involved sites. Also POdF has a higher prevalence in females. POdF is frequently misdiagnosed as a reactive inflammatory lesion, because of its similar appearances and sites involved.² Odontogenic epithelium is present, but plays a minor role when compared to the fibrous component. If present, mineralized tissue may take the form of osteoid, bone, or cementum-like material.

Daley and Wysocki³ have reported POdF to be the third most common odontogenic tumor and the most common peripheral odontogenic tumor. Lesions that have added to the controversy surrounding POdF are the so-called odontogenic epithelial hamartoma,^{4,5,6} hamartoma of the dental lamina⁷, and peripheral ameloblastic fibrodentinoma,⁸ all of which are considered by many to be within the histologic spectrum of the POdF.^{7, 9-12}

Methods

In this case report, a POdF is presented that was found to recur multiple times, until it was

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aggressively incised with the resultant defect requiring periodontal esthetic surgical therapy. In February of 2011, a 56 year old black female presented with a chief complaint of “a lump on the gum that has been growing for nearly 10 years.” (Figure 1) The lesion reportedly had been treated elsewhere by laser therapy as a likely fibroma in 2002, and again in 2004, after which time it did not recur until 2010.



Figure 1. Initial presentation of lesion relative to smile line.

Histologic evaluation had never been performed. Subsequently, at a regularly scheduled dental cleaning, the patient was then referred by the general dentist for an updated opinion concerning the gingival mass. Evaluation of the medical history revealed that the patient had multiple sclerosis, a family history of diabetes, treatment six years prior for colon cancer, and took vitamin supplements as needed. Radiographic evaluation was unremarkable. Clinical examination revealed a 9x10mm round sessile reddened nodule facial to #9 (Figure 2) with periodontal probing depths of 2-3mm on the maxillary anteriors. There was no mobility of any teeth proximal to the lesion.



Figure 2. Initial presentation close up.

Case Management

The patient was appointed the following day for excisional biopsy of the affected site. Tooth #'s 8, 9 were scaled, the lesion was removed, and the biopsy was sent for histological evaluation. At the 1-week post-op appointment, it was evident that the lesion was recurring (Figure 3).



Figure 3. One week following biopsy surgery, exhibiting early recurrence.

At 13 days postoperatively, a histologic diagnosis was received of peripheral odontogenic fibroma with randomly oriented cementum-like deposits (Figure 4).

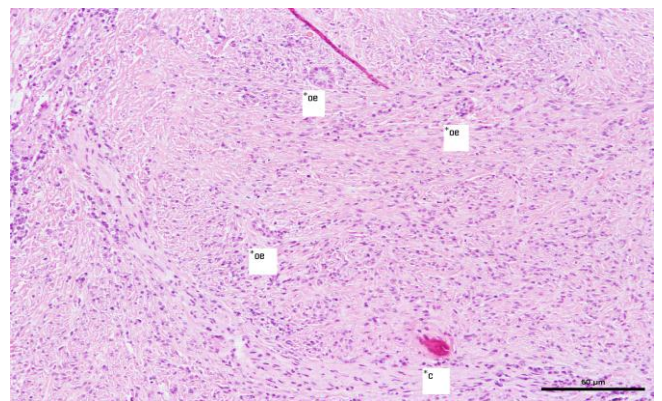


Figure 4. Fibromyxomatous proliferation containing three islands of odontogenic epithelium (*oe) and exhibiting one area of calcification (*c). (magnification 10x)

The pathologist upon consultation relative to the recurrence suggested retreatment, this time removing 2-3 mm of marginal tissue beyond the lesion, as it was felt that recurrence must have been caused from an incomplete removal of the entirety of the lesion at the surgery 3 weeks prior. Fearing esthetic complications of excessive radicular display of tooth #9, it was

suggested that crown lengthening on the other 5 anterior teeth be done in order to “balance” her gingival curtain as much as possible. At a presurgical appointment, the patient was given pre and post operative instructions, as well as prescriptions for Alprazolam 0.5 mg as a presurgical anxiolytic, Azithromycin 500 mg to be taken daily for 5 days, and Hydrocodone 7.5/325 mg x 10 to be taken as needed for pain. This surgery was performed 4 weeks following the original biopsy (Figure 4), at which time esthetic crown lengthening was performed on the facials of teeth numbers 6-8, 10, 11 and the fibroma was removed, inclusive of the surrounding tissue (Figures 5-8). The tissue again was submitted for biopsy.



Figure 5. More aggressive removal of the lesion at the retreatment surgery.

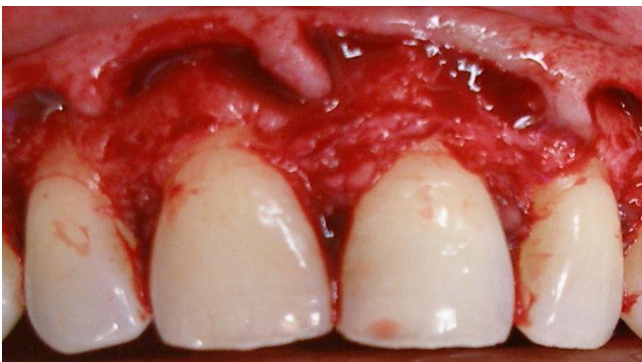


Figure 6. Exposed osseous tissues of surrounding anterior teeth, prior to esthetic crown lengthening in an attempt to create symmetry following aggressive lesion removal over tooth #9.

No periodontal dressing was employed. Postoperative hygiene included wiping the surgical area with cotton balls dipped in saline.



Figure 7. View of osseous tissue removal performed on the facials of teeth #'s 6-8, 10, 11 in an effort to create symmetry with tooth #9 following aggressive lesion removal.



Figure 8. Closure of repeat biopsy/crown lengthening surgery.

Clinical Results

The patient was seen at 1 week for evaluation. Due to slight redness of the facial gingiva on #10, we refilled her prescription for azithromycin.

One week later, the patient was again evaluated and polished. The histology of the second biopsy (Figure 9) showed no granulomatous cells in the marginal tissue, but advice was given by the pathologist to continue to monitor the patient since the possibility of recurrence still exists.

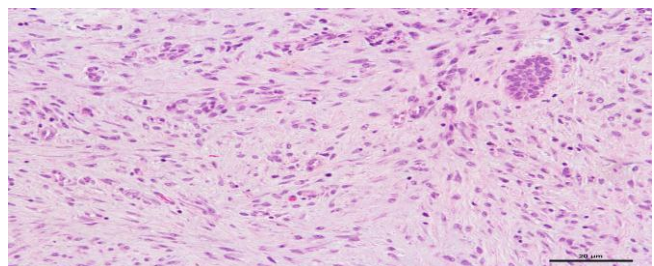


Figure 9. Fibromyxomatous proliferations containing one island of odontogenic epithelium. (magnification 20x)



Figure 10. Patient at 3 weeks of healing.

The patient was seen at weeks 3 (Figure 10) and 4 for evaluation and plaque removal/debridement, and a final postoperative care appointment occurred at 6 weeks postoperatively (Figure 11), at which time tissues appeared to be healing uneventfully. The patient was advised to return for prophylaxis and periodontal examination in 6 months (seeing the general dentist 3 months from this final postoperative appointment); however, the patient was unwilling to return until approximately 14 months postop, at which time the tissues still appeared to be free of granulomatous tissue (Figure 12). Probing depths (Figure 13) and the periapical radiograph (Figure 14) were within normal limits.



Figure 11. Patient at 6 weeks of healing.



Figure 12. Patient at 14 months of healing.

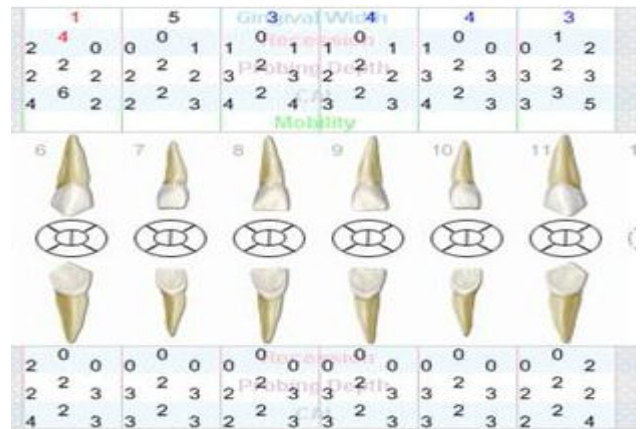


Figure 13. Probing depths of anterior teeth, 14 months postoperatively.



Figure 14. Radiograph of #'s 8, 9, 14 months postoperatively.

Discussion

In what is reportedly the study with the largest number of cases to include follow-up, Ritwick and Brannon¹³ studied 151 cases of peripheral odontogenic fibroma, which comprised 23% of all odontogenic tumors (655 cases) in the archives of the Louisiana State University School of Dentistry Department of Oral and Maxillofacial Pathology.

They reported a mean subject age of 37.3 (± 17.8 years), with the highest incidence in the second and fourth decades, after which age the incidence of the lesion declined for every decade. The lesion occurred in the maxilla 41.5% and in the mandible 58.5% of the time.

The lesions were reported in Caucasians 67.8% and in African Americans 30.5% of the time. Radiographic features were available on

12 patients, of which 6 had no calcifications or underlying osseous pathology. Complete surgical excision could be established microscopically with reasonable certainty in only 7 cases, of which follow-up was only available on 1 case: this case did not exhibit recurrence.

Histogenesis of the peripheral odontogenic fibroma has not been established, but derivation from each tissue component resident to the site of occurrence has been speculated, namely from dental lamina rests,^{4,5} ectomesenchyme^{9,14} and surface epithelium^{4,15} and the periodontal ligament.^{16, 17} Several have suggested that the rests of dental lamina that persist in the gingiva following disintegration of the dental lamina may be the embryologic source of the POdF.^{15,16} Farman⁹ suggested that the ectomesenchyme in the gingiva may induce secondary proliferation of dental lamina remnants and also of the basal layer of the gingival epithelium. Takeda,¹⁵ who reported a case of the granular cell variant of POdF, suggested that extraosseous odontogenic epithelium is a probable source of peripheral odontogenic tumors including POdF. Ritwik and Brannon¹³ noted basal cell layer budding in the surface stratified squamous epithelium and considered it a feature of surface epithelium activity. Although deVilliers and Marx¹⁷ have favored the periodontal ligament as the source for the fibroblastic component of POdF, Ritwik and Brannon found along with others^{3,4,11,16} that these lesions have occurred on the edentulous ridge, and 1 case report shows the lesion occurring on the edentulous ridge of a neonate.¹⁸ The possibility of the fibroblastic component of POdF originating from the periodontal ligament thus seems unlikely. Although the WHO classifies odontogenic fibroma as a tumor of odontogenic origin composed of odontogenic ectomesenchyme with or without odontogenic epithelium.^{19,20} Ritwik and Brannon¹³, Daley and Wysocki,³ and Slater and Woo,²¹ feel that POdF is more so a mixed odontogenic tumor composed of both odontogenic ectomesenchyme and odontogenic epithelium.

Some studies have suggested a low recurrence while Kenney,²² deVilliers¹⁶, and Buchner¹² found few to no recurrences. Daley and Wysocki³ found 38.9% recurrence, and Ritwik and Brannon¹³ found 50%. (This recurrence rate is clinically significant and emphasizes the need for a better understanding

of the biologic behavior of this lesion.) Such a high recurrence rate supports a neoplastic process rather than a hamartoma as Weber et al²³ proposed. Furthermore, the POdF has shown a tendency for multiple recurrences, implying that it can be clinically persistent.

Additionally, while the WHO definition of POdF is the presence of "apparently inactive odontogenic epithelium,"^{19,20} inductive effects were noted by Ritwik and Brannon.¹³ Because these effects were in the connective tissue in direct apposition to the rests of odontogenic epithelium suggests that there is interplay between the ectomesenchyme and epithelial rests, so that perhaps the use of the phrase "apparently inactive,"^{19,20} to refer to odontogenic epithelial rests should be reconsidered. Further, Ritwik and Brannon¹³ noted that whereas lesions that had calcifications in apposition to odontogenic rests were less likely to recur ($P=.0076$), lesions without calcifications, but with active surface epithelium in the form of budding of the basal cell layer of the rete ridges were associated with significantly higher recurrence ($P=.0186$). They anticipated that inadequate surgical excision would be associated with recurrence of the lesion, yet in most of their histopathologic slides, they were unable to differentiate between lesional connective tissue and normal-appearing connective tissue, making it difficult to adequately determine complete excision. Neither the size of the lesion nor race was found to be associated with altered recurrence of POdF.

It is not known whether or not performing crown lengthening wherein nearby osseous tissue is removed will affect recurrence in POdF. Further investigation of the behavior of these lesions in the vicinity of surgical manipulation of the hard and soft tissues would be of interest. For example, how might a subepithelial connective tissue graft placed under the area of the excised POdF and over the osseous tissue affect a persistently recurrent lesion? Does bony alteration from recontouring or grafting stimulate any cellular response within the surrounding tissue to initiate, encourage, or limit recurrence? Over time, as clinicians track and document lesion activity following surgical removal it might be better understood how to interfere with certain neoplastic activity.

Conclusion

Whereas it appears that more recent reports indicate a high recurrence likelihood in certain types of POdF, especially in the noncalcified variety, it seems logical that complete removal with aggressive excision of even the surrounding tissue would be recommended. However, this would yield an unesthetic outcome as a result from the surgical procedure performed; therefore, cosmetic repair either with augmentation, coronally advanced flaps, and/or "blending" with crown lengthening of the surrounding tissues may be in order. Careful diagnostic techniques along with exceptional manipulative skill of the treating periodontist will be essential to maximize patient satisfaction in cases with esthetic compromise resulting from lesions such as the POdF.

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