

Non-Surgical Management of Unusually Large Chronic Recurrent Periapical Abscess and an Insight on Periapical Radiolucencies

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Abstract

Recurrent inflammatory periapical lesions are commonly encountered oral pathologies. The usual cause of these periapical lesions is endodontic in nature and can be easily treated by endodontic treatment. They exhibit wide biologic behaviors and their presentation as recurrent pus discharging ulcers can lead to patient's apprehension and even be cause for clinician's anxiety. This is because many non-endodontic causes may also lead to periapical lesions. A thorough knowledge about them therefore, is crucial for clinicians not only to properly diagnose and manage such cases, but is also important to safeguard themselves from patient's evil intentions of making easy money by claiming refund. The present case is one such example where unusually large chronic recurrent periapical abscess was managed with non- surgical endodontic treatment. With this case report, authors intend to discuss the different periapical radiolucencies and explain scientific guidelines for their adequate diagnosis and management.

Keywords: Endodontic; Non-endodontic; Periapical; Recurrent; Radiolucency

Introduction

Recurrent inflammatory periapical lesions are common afflictions presenting in dental clinics. They are easily diagnosed by presence of periapical radiolucency in radiograph and usually have an endodontic cause. Sometimes, their chronic presence as recurrent pus discharging ulcers can lead to patient's apprehension. A highly apprehensive patient with unresolved dilemmas can become a cause of anxiety even for the clinician. This is because periapical radiolucencies may have non-endodontic causes as well [1]. To manage such cases adequately, clinicians must have thorough knowledge of different periapical radiolucencies which remains enigmatic for most. Clinician's awareness about the contest is also crucial to safeguard themselves from patient's evil intentions of making easy money by claiming refund. The present case is one such example where unusually large chronic recurrent periapical abscess was managed with non- surgical endodontic treatment. With this case report, authors intend to discuss the different periapical radiolucencies, and explain scientific guidelines for their adequate diagnosis and management.

Case Report

Forty one (41) years old female patient reported to department of dental services in Asian Institute of Medical Sciences with the chief complain of reoccurring ulcers with pus discharge in lower front gums since 3 - 4 years. Patient was quiet apprehensive about the same. On eliciting history of presenting illness, patient revealed that the ulcers developed spontaneously at intervals of approximately 15 days to one month. The ulcers gradually increased in size and then resolved by themselves within a week after pus discharge. There were no other associated symptoms. Patient consulted private practitioner in her vicinity approximately one year back for the same and undergone a root canal treatment in 32. However, similar ulcers and pus discharge after approximately 2 months of completion of treatment lead to the patient's apprehension. Further, the patient's fear against cancer added onto the same. Patient was scared that she might be suffering from a major illness which remains undiagnosed since long.

On intraoral examination, oval erythematous area, approximately 2 - 3 mm in diameter was seen immediately adjacent to frenum on right side (Figure 1). It was non-tender and no blood/pus discharge was seen. Generalized calculus deposition on teeth was seen. Temporary restoration was present in 32. A provisional diagnosis of recurrent periapical abscess in 32 was made and an RVG was done.

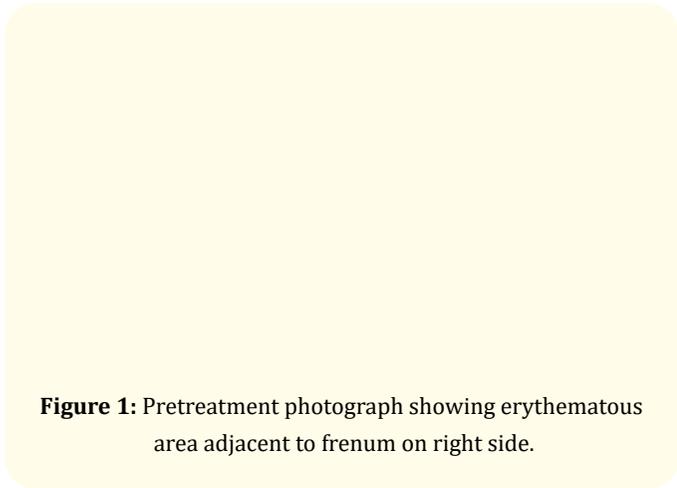


Figure 1: Pretreatment photograph showing erythematous area adjacent to frenum on right side.

RVG (Figure 2) revealed a large periapical radiolucency of approximately 8.0 x 10.0 mm involving 41, 31, and 32. Widening of periodontal ligament space in coronal and middle third and loss of lamina dura at apex of 41, 31 and 32 was seen. The Gutta Percha in 32 was approximately 2.5 - 3 mm short of apex. Vitality test was performed and 41 and 31 were found to be non-vital. A final diagnosis of chronic recurrent periapical abscess was made.

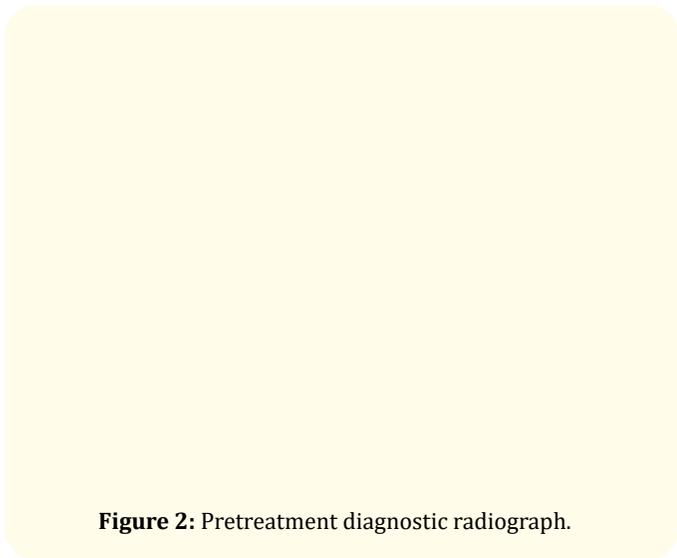


Figure 2: Pretreatment diagnostic radiograph.

Patient's apprehension was the major impediment in the treatment. She was explained about the other causes of periapical radiolucencies along with hers. All the options to treat the present case i.e. nonsurgical endodontic management, apicoectomy and extraction along with their pros and cons were also explained. Patient opted for non-surgical management and after taking informed consent from the patient, treatment was started.

Oral prophylaxis was performed, access opening in 41, 31 and 32 was made and Gutta Percha from 32 was removed. A strong odour discharge from canals was present. Canals were debrided using normal saline, sodium hypochlorite, 17% EDTA, dentchlor, shaped using mechanical instrumentation and intracanal calcium hydroxide and iodoform (calplus) dressing was placed. Dressings were changed six times at a week's interval over a period of one and a half month.

During the treatment no ulcerations/symptoms were seen. When the canals were free of any discharge, they were dried and sealed using gutta percha and AHplus (Figure 3). Post obturation restoration was done after one week. Oral hygiene instructions were given and patient was kept warm saline rinses and gum paint and recalled for follow-up every 15 days. Patient is asymptomatic since 3 months and clinical examination revealed intact mucosa (Figure 4) and radiographic healing of lesion (Figure 5).

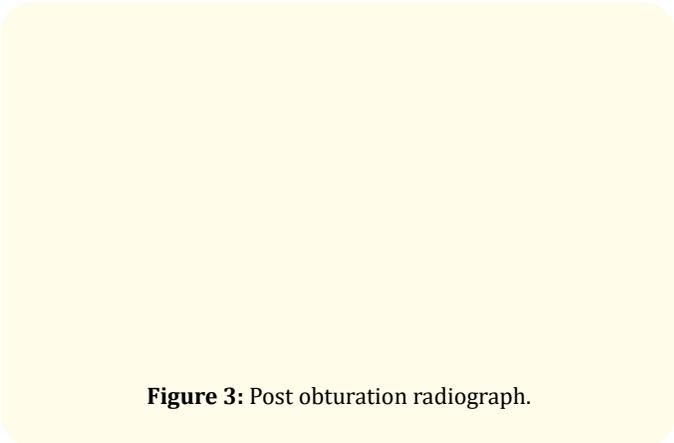


Figure 3: Post obturation radiograph.

Discussion

The highlight of the present case is the patient's apprehension regarding her chronic illness which also acted as a major obstacle at a point during the treatment and was dealt with. Whenever an x-ray with periapical radiolucency presents to a clinician, first and foremost an endodontic cause is thought off and an endodontic

Figure 4: Photograph showing intact mucosa.

Figure 5: Radiograph showing signs of healing.

treatment is rendered. However, there may be other non-endodontic causes as well. In presence of these non-endodontic causes, the periapical lesions remain unhealed by endodontic treatment and cause patient dissatisfaction [1]. To diagnose, counsel and manage such cases adequately, it is imperative for clinicians to be aware of non-endodontic causes also.

The endodontic causes of periapical radiolucencies include [1] periapical granuloma/cyst/abscess [2,3], Condensing Osteitis or Focal Chronic Sclerosing Osteomyelitis [2,3], and periapical scar [2-4]. Non-endodontic periapical radiolucencies are caused by odontogenic and nonodontogenic cysts [1], benign and malignant jaw tumors [5] and infectious diseases [1,6,7]. Their clinical, radiographic, histopathological features and management has been tabulated in table 1.

To differentiate endodontic and non-endodontic causes of periapical lesions it is important to adequately record medical, dental history, intraoral examination including dental hard and soft tissues as well as radiological findings [1]. Endodontic periapical lesions do not separate from root apex by changing radiographic angles [8]. Pulp vitality tests can serve as a diagnostic measure and help in differentiation of endodontic cause. They help to distinguish vital tooth from nonvital but cannot differentiate between different pathologies. If the involved tooth is found to be vital then, the non-endodontic cause is confirmed and biopsy is required to diagnose [9]. However, endodontic cause cannot be ascertained by negative vitality test [10]. If endodontic cause is confirmed and patient has pain during the instrumentation without local anaesthesia, the diagnosis should be suspected and further evaluation might be required [1]. If the lesion shows growth in size or remains unchanged after a year of adequate endodontic treatment, then, other causes must be suspected [11]. Histopathologic evaluation of periapical lesions is crucial were endodontic treatment has been failed [12]. American Association of Endodontics has put forward the guidelines suggested by Gallego Romero., *et al.* for treatment of periapical lesions are tabulated in table 2 [9]. About 12% of all periapical lesions have non-endodontic causes [13]. Biopsy and histopathologic evaluation of such lesions can help in reaching adequate diagnosis, thereby proper treatment planning [13]. The indications of biopsy as recommended by Razavi SM, Kiani S., *et al.* are summarized in table 3 [1].

In the present case, involved teeth were intact, with a substantial calculus deposition. Thus, it might be possible that the abscess progressed to the periapical area through periodontium and lead to non- vital teeth. Absence of oral prophylaxis and previous inadequate endodontic treatment lead to the reoccurrence of lesion. Patient however, tried to threaten the treating clinician for refund of whole treatment cost during follow-up, but was counselled and managed adequately.

There are numerous case reports in English literature on non-surgical management of periapical lesions; but to the author’s best knowledge, none has reported non- surgical management of a periapical lesion of such a large extent. The present case is first one to do so and is thought to be rare.

Conclusion

Periapical lesions are commonly encountered and can exhibit wide biologic behaviours. Onus lies on clinicians to adequately diagnose them and avoid endodontic mistreatment. Therefore, they

Periapical lesion	Clinical features	Radiographic features	Histopathological features	Management
Periapical lesions due to endodontic causes				
Periapical Granuloma	Asymptomatic unless acute inflammatory reactions cause initiating symptoms like pain, swelling, fever, and lymphadenopathy	Well-defined or ill-defined radiolucency, at root apex, Widening of periodontal ligament space in apical part of the root/lamina dura and root resorption	Periapical granuloma contains infiltration of inflammatory cells such as polymorphonuclear leukocytes (PMN), lymphocytes, macrophages and plasma cells, which are supported by granulation tissue	Extraction, root canal therapy, apical surgery, or in some cases, the combination of these
Radicular Cyst	Asymptomatic unless acute inflammatory reactions cause initiating symptoms like pain, swelling	Exhibits thin radiopaque line around periphery of radiolucent area indicating reaction of bone to slowly expanding mass	Cystic Cavity lined by nonkeratinized stratified squamous epithelium, fibrous connective tissue wall shows infiltration of inflammatory cells and small blood vessels, cholesterol clefts, macrophages and multinucleated giant cells are also seen	Extraction, root canal therapy, apical surgery, or in some cases, the combination of these
Condensing Osteitis or Focal Chronic Sclerosing Osteomyelitis	Mandible > maxilla, prevalent in molars, focal lesion in periapical area of the teeth with necrotic or inflamed pulps, extended caries, and restorations, may be seen in the teeth with inappropriate root canal therapy and the teeth under occlusal trauma	Local homogeneous radiodensity in root apex area of the teeth with PDL widening, does not have radiolucent margin	Sclerosis and remodeling of bone, If the adjacent inflammatory cells infiltrated into the sclerotic bone, necrosis often occurs	Similar to other inflammatory endodontic lesions; in some cases, however, radiopacity without symptoms is observed after conventional treatment. In these cases, retreatment is not required
Periapical Scar	Reparative response, which is characterized by the formation of dense collagen fibers instead of the mature bone, Asymptomatic	Nonhealing radiolucencies in periapical areas of the teeth with favorable root canal therapy	Fibrous tissue	Retreatment is not required
Periapical lesions due to nonendodontic causes				
Nasopalatine Duct Cyst	1.3% to 4.2% of nonodontogenic cyst, asymptomatic, but sometimes show pain, swelling of the anterior palate, response to palpation of buccal and palatal structures, and pus drainage. Teeth adjacent to these lesions are vital	Well-defined radiolucency in the maxillary midline or between the apexes of central incisors roots. root resorption. This cyst can be misdiagnose as an inflammatory periapical lesion when radiographs show a superimposition of the incisor canal or foramen over the apex of maxillary central incisors	Cystic lesion lined by ciliated stratified squamous epithelium with fibrous connective tissue wall, and various degrees of inflammatory cells	Surgical enucleation
Simple Bone Cyst/ traumatic bone cyst	Fluid contained benign cavity in the jaw bone, which lacks epithelial cover	Rarely seen as a well or ill-defined radiolucency in periapical area. If this lesion has involved several teeth, scalloped prominence among the dental roots is seen	Walls of the defect is lined by a thin band of fibrous connective tissue or thickened myxofibromatous proliferation, which often has trabeculae of reactive bone	Exploratory surgery is necessary for diagnosis and is usually sufficient therapy

Odontogenic Keratocyst	Comprises about 0.7% of all periapical cysts, Affects posterior area of the mandible, usually asymptomatic, but some present with pain, swelling, and pus drainage, has an aggressive behavior and high rates of recurrence	Unilocular or multilocular well-defined radiolucency with or without root resorption	Cystic lining consists of a relatively uniform layer of parakeratinized stratified squamous epithelium with six-cell to ten-cell thickness without rete ridge formation and with corrugated surface. The basal layer of cuboidal to columnar cells with hyperchromatic and palisaded nuclei is observed. The connective tissue wall may show epithelial islands or daughter cyst, and some cases may have acute or chronic inflammation	Enucleation and curettage, Due to high rates of recurrence, the patient with this lesion should be followed up after five years of treatment
Lateral Periodontal Cyst	Asymptomatic,	Misdiagnosed as a lateral radicular cyst, because of the similar radiographic features including radiolucency along lateral root surface	Cystic cavity lined by thin stratified squamous epithelium and in some area, by focal nodular thickening	Conservative enucleation without root canal therapy
Calcifying odontogenic cyst (COC) or Gorlin's cyst	Asymptomatic, mandible = maxilla, 65% of these lesions are in the anterior jaw	Unilocular or multilocular well-defined radiolucency and occasionally with diffuse radiopaque areas	Cystic cavity with a fibrous capsule and an odontogenic epithelium lining, with epithelium basal cells similar to ameloblasts, presence of ghost cells within the epithelium. Calcification area are seen	Enucleation of the lesion
Central Giant Cell Granuloma	Common in anterior segments of the jaws and usually crosses through the midline, Nonaggressive type has slow growth and low recurrence rate, In aggressive type, the rapid growth, high rate of recurrence	Well-defined unilocular or multilocular radiolucency, Root resorption and cortical perforation is uncommon in Nonaggressive type, cortical bone perforation, root resorption, and tooth displacement in aggressive type	Proliferating endothelial cells, fibroblasts and myofibroblasts, small blood vessels, and multinucleated giant cells in a connective tissue	Involved teeth of this lesion are vital. Treatment is curettage, but radical surgery may be needed for aggressive type
Ameloblastoma	Second most common odontogenic tumor after odontomas, mandible is the common site	Three different types of clinicoradiologic features including conventional solid, unicystic and peripheral.	Several histopathologic subtypes are recognized. The most common histopathologic pattern is follicular that is comprised of the islands of loosely arranged cells resembling the stellate reticulum of enamel organ which surrounding by columnar ameloblastic-like cells with reversed polarity.	Marginal resection of at least 1.0 to 1.5 cm beyond the radiologic limits of the tumor
Ossifinig Fibroma	Posterior region of the mandible is the most common site, rare benign jaw neoplasm, often asymptomatic, and in some cases lead to swelling of the cortical plate of the jaw	Based on the amount of calcified material, radiographic view could be mixed radiolucent and radiopaque	Shows connective tissue of variable cellularity with mineral component in the form of trabecular or woven bones.	Complete excision of the tumor

Periapical Cemental Dysplasia (Cementoma)	Jaw fibrous lesions that often involves the periapical region of the anterior mandible, usually asymptomatic	In early stage, well-defined unilocular radiolucency involving root apex, loss of lamina dura. In second stage of maturation/mixed stage, radiopaque components within the radiolucent area. In final stage, the lesion may be totally radiopaque with radiolucent border	Show the cellular mesenchymal tissue and collagen fibers with small blood vessels, a mixture of woven or lamellar bones, and cementum-like particles	Because of tendency for expansion of jaw, extraction of tooth is done
Cementoblastoma	Comprises < 1% of odontogenic tumors, true neoplasm of cemental origin, Mandible > maxilla, grow slowly, usually asymptomatic, occasionally have mild pain. localized expansion of cortical plates of bone	Well-defined radiopacity with a cortical border, which is confined by a radiolucent margin,	Cementum like tissue deposited in globular pattern, reversal lines scattered throughout, variable soft tissue component consisting of fibrillar, vascular and cellular channels	Because of tendency for expansion of jaw, extraction of tooth is done
Malignant Jaw Lesions Lymphoma, leukemia, multiple myeloma, squamous cell carcinoma, adenocarcinoma, chondrosarcoma, osteosarcoma, and metastatic lesions	Existence of dental caries, root resorption, irregular radiolucency, and localized tooth mobility without periodontal disease indicates the need for further investigation. Moreover, observation of sensation disorder, previous endodontic treatment failure, unusual pain, and swelling emphasize on the necessity of more radiographic and clinical or histopathologic evaluations	Ill-defined radiolucency without cortical border, bony islands in the radiolucent area can create a patchy appearance, unusual symptoms including bone destruction with rapid or slow growth adjacent to the vital teeth	Varied histologic features, show tumor cells, dedifferentiation/ anaplasia, invasion in vital structures	Biopsy and complete resection of tumor and radiotherapy.
Infection Disease	Actinomycosis, histoplasmosis, and aspergillosis	Varied features	Band of fibrous connective tissue with chronic inflammatory cells infiltration and colonies of organisms	In addition to endodontic treatment, antibiotic therapy, and occasionally, apical surgery is required
Granulomatous Inflammation	Foreign body reaction, fungal and mycobacterial infections, and cholesterol derivatives from cell necrosis	Variable	Shows diffuse infiltrate of macrophages and multinucleated giant cells, formation of typical granulomas	Biopsy and complete removal of the lesion is necessary

Table 1: Salient features of clinical, radiographic, histopathological features and management of periapical lesions.

S. No.	Periapical Lesion	Therapeutic Approach
1.	Diameter < 5 mm	Conservative approach, short-term follow-up
2.	Diameter of 5 - 10 mm with endodontic diagnosis	Conventional root canal therapy, 3 months follow-up
3.	No healing in 3 months after treatment	Consultation with oral and maxillofacial surgeon before retreatment
4.	Diameter > 10 mm	Consultation with oral and maxillofacial surgeon for apicoectomy and conventional root canal therapy

Table 2: Guidelines of the American association of endodontics for periapical lesions [9].

S. No.	Indications
	Lesions involving periapical area of vital tooth
	Persistent or continuously growing periapical lesion even after adequate endodontic treatment
	Persistent periapical lesion even after adequate endodontic re- treatment
	Periapical lesions showing advancing mobility of involved or adjacent teeth in absence of periodontal disease and irregular radiolucency
	Periapical lesions which shows any change and separate from root apex with changing radiographic angulations
	Periapical lesion with unusual radiographic features involving tooth without caries or with low caries
	Persistent Periapical lesion with unusual symptoms such as sensation disorders
	Persistent Periapical lesion with or without progressive growth in the patient with history of malignancy

Table 3: Indications of biopsy as recommended by Razavi SM., *et al* [1].

should be aware of the indications of biopsy and other paraclinical tests and refer the patient to Oral and Maxillofacial pathologist/ Surgeon wherever required.

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Conflict of Interest

Authors declare that there are no financial interests or any conflict of interest.

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