

Local Drug Delivery Of Tetracycline Fibres for The Treatment of Chronic Periodontitis – A Case Report

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Introduction

Chronic periodontitis is an inflammatory disease of the periodontium and the most common oral condition of human population. It affects more than 70% of Indian population.¹ It has bacterial etiology, alters the immune response and causes subsequent tissue destruction.² Due to its microbial origin it is important to eliminate or reduce the microbial colonies present in the subgingival region which is also the main goal of the periodontal therapy. Periodontal therapy includes various modalities such as mechanical debridement of plaque and calculus and surgical therapy. But mechanical debridement has some limitations because of the inaccessibility to the deeper subgingival location of these microorganisms. Therefore the use of antimicrobials along with the mechanical debridement is necessary. But systemic antibiotics has considerable amount of side effects and also it does not reach to the periodontal pockets in a required concentration. To overcome this issue local drug delivery system has been introduced. In this case report tetracycline fibres as a local delivery system is used as an adjunct to the scaling and root planing for the treatment of periodontal pocket.

Case Report

A 50 year old female patient reported to the department of periodontology in GDC & H Mumbai with the chief complaint of food lodgement in the lower front teeth. Patient gave no history of any relevant medical condition. On examination, crowding of lower anterior teeth was present. When checked for periodontal status clinical attachment loss was seen with mandibular left lateral incisor with 3 mm recession and 5 mm of probing pocket depth.(fig. 1) Grade 1 mobility was present with the same tooth. Oral hygiene was relatively good. Intraoral periapical radiograph showed vertical bone loss with respect to mandibular left lateral incisor.(fig. 2) There was no other periodontal pockets seen in any other site therefore a decision to treat this isolated periodontal pocket with local drug delivery system was made. We chose tetracycline fibres marketed as Periodontal Plus ABTM (Advanced Biotech, Chennai, India), available as vials with tetracycline impregnated collagen fibres. These fibres are brownish in color and resorbable. (Fig. 4)

Prior to that patient underwent scaling and root planing and was kept on maintenance phase for 1 month. On her follow up probing pocket depth was measured which had not reduced after the initial mechanical debridement. Alginate impressions were made of both the maxillary and mandibular arches. Acrylic stent was prepared on the casts. Curettage was

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done prior to insertion of the fibres in the pocket (Fig. 3). Proper isolation with cotton rolls was done and the fibres were soaked in saline and packed into the periodontal pockets with a curette until the pocket was filled upto or slightly below the gingival margin that is upto 4-5 mm of the pocket. (Fig. 5) Periodontal dressing (Coe- Pak) was also placed on the site (Fig. 6). To avoid dislodging of the fibers patient was instructed not to brush or floss the treated area and was placed on twice a day warm saline rinses for 2 weeks. Patient was recalled for a follow up after a week and three months. Periodontal dressing was removed after one week. Clinical parameters were checked after three months and reduction in pocket probing depth was observed to be 3 mm. (Fig. 7)

Discussion

Dental plaque is the primary etiologic factor for the initiation and progression of periodontal diseases. This plaque is nothing but the aggregate of different microbial colonies that forms the biofilm. This biofilm reaches deeper subgingivally and it becomes difficult to access it during routine oral hygiene practices. The use of local antimicrobial agent is to prevent or control microbial-induced inflammation in an effective concentration and be maintained long enough for the desired effect to be accomplished without causing any side effect.⁴ Various drugs in different forms have been used by far for the local delivery such as tetracycline, metronidazole, chlorhexidine. Tetracycline containing fibres are the first local drug delivery system introduced.⁴ It had non resorbable ethylene/vinyl acetate copolymer fibres with diameter of 0.5 mm, containing tetracycline 12.7mg per 9 inches. Bioresorbable tetracycline fibre has been developed with base of collagen film, which is commercially available as Periodontal Plus AB. It has the advantage of no second appointment for removal as it degrades within 7 days. The system is dispensed in vials containing 25 mg of fibrillary collagen which contains 2 mg of tetracycline HCL.

In a split mouth study done by Dang et al (2016) on 20 patients where 3 sites were selected in each patient and scaling and root planing was performed in site A; whereas in site B, only tetracycline fibres were placed; and in site C, both SRP as well as the tetracycline fibers were placed. At day 30, PI, GI, and CAL in three groups did not show a significant difference

among groups. However, for PD, a significant intergroup difference was observed⁵

In a systematic review done by Nadig et al (2016) significant attachment gain was observed in all tetracycline groups at three and 6 months (1.23 mm: 1.03, 1.43 and 1.02 mm: 0.28, 1.75 respectively)⁶

Panwar et al (2009) studied tetracycline fibres as an adjunct to scaling and root planing in 30 patients and concluded that Use of tetracycline fibre as an adjunct to SRP is more effective in reducing inflammation than SRP alone⁷

Somayaji B.V et al (1998) compared tetracycline with metronidazole as a local drug delivery system and observed that both the drugs are effective in eliminating subgingival microorganisms and tetracycline demonstrated a faster release than metronidazole.⁸

Conclusion

Scaling and root planing has always been a gold standard for the treatment of periodontitis. Review of literature and the result of this case suggest that tetracyclines are a useful adjunct to conventional non-surgical treatment but are no substitute for these measures⁹. The use of local delivery systems with antimicrobials cannot replace the need for thorough scaling and root planing.

Declaration Of Consent

The authors certify that they have obtained all appropriate patient consent forms.

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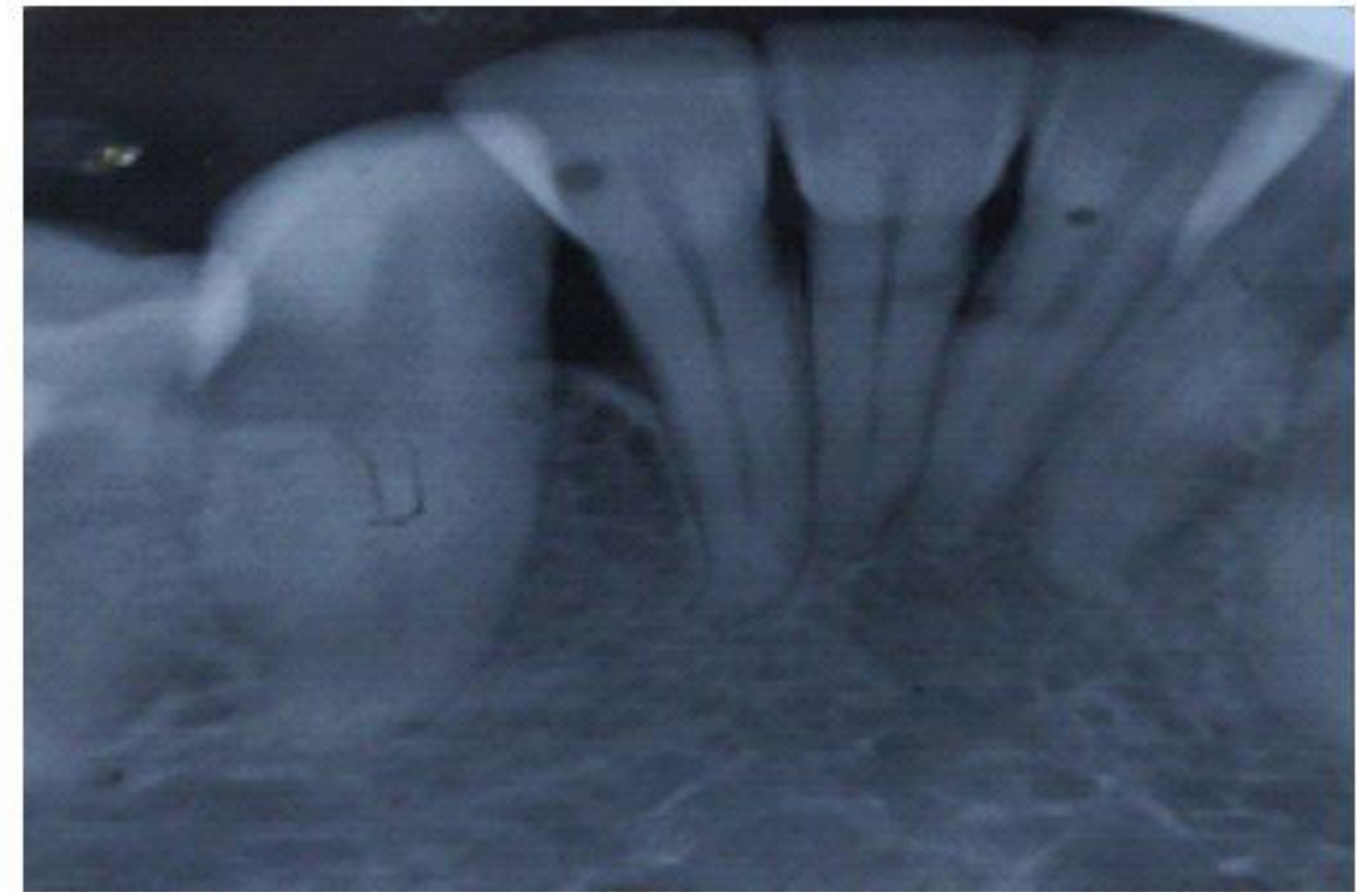
Nil

Conflicts Of Interest

There are no conflicts of interest



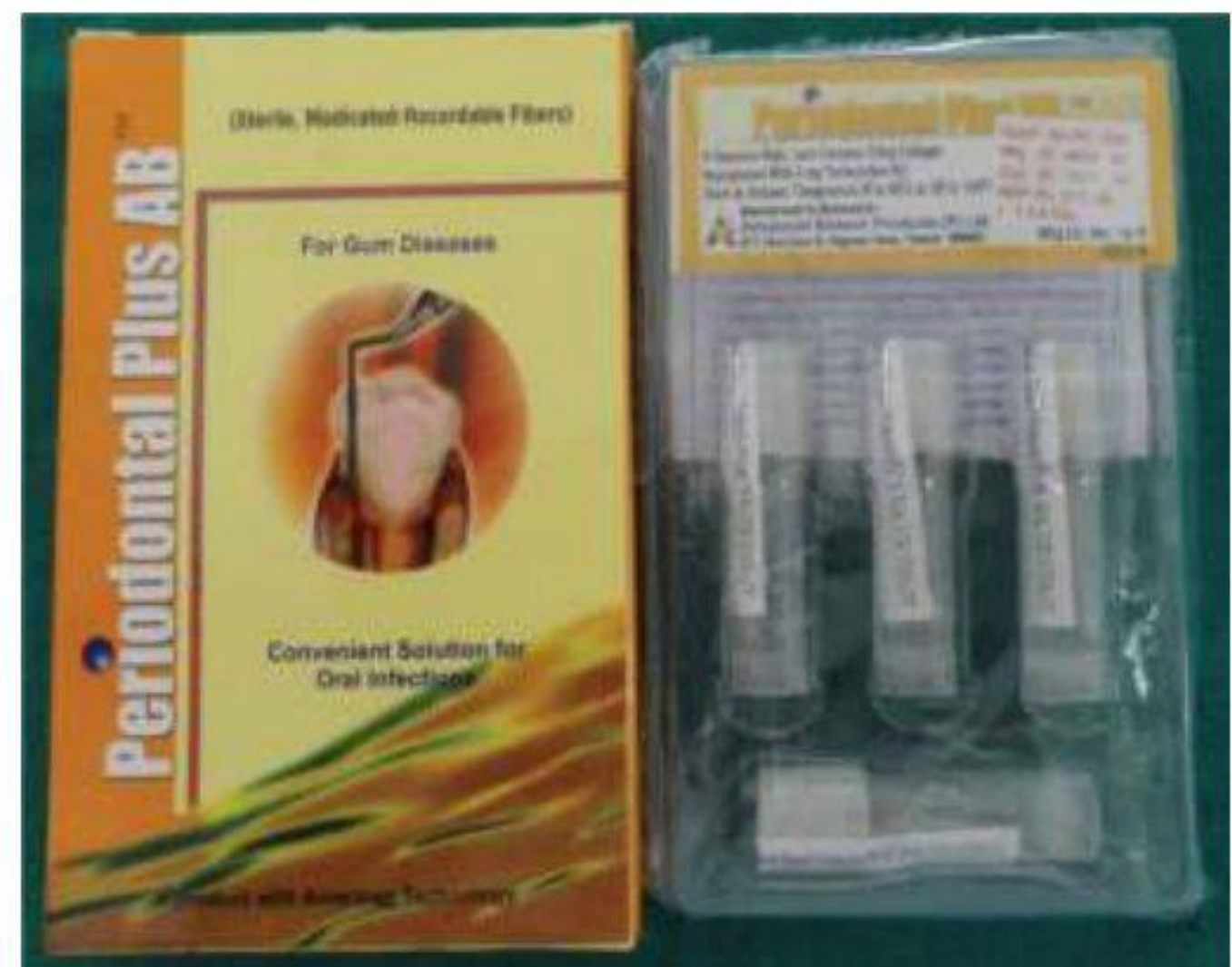
1. At baseline with acrylic stent. Probing pocket depth is 5 mm



2. Intraoral periapical radiograph showing bone loss on distal to the lateral incisor



3. Curettage



4. Insertion of fibres in the periodontal pocket



5. Insertion of fibres in the periodontal pocket



6. Periodontal dressing placed



7. Post op after 3 months. Pocket depth reduced to 3 mm

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