SURGICAL VERSUS NON SURGICAL MANAGEMENT OF PERIAPICAL LESION - A CASE REPORT

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Introduction

There are two approaches for endodontic treatment of periapical lesion -surgical & nonsurgical . Nonsurgical endodontic treatment is a predictable treatment option with success rate of 86.02%. However the situations which warrants surgical approach are persistent periradicular pathosis,presence of true periapical cysts, cholesterol crystals in periapical area hindering healing & failure of previous nonsurgical retreatment.

Debridement of apical lesions heal almost always by repair..Since this is not ideal, newer approaches such as *regenerative procedures* that aim to restore lost tissue have been introduced" *Regeneration* is reproduction or reconstitution of a lost or injured part without scarring."

Various regenerative options available are barrier membranes, bone graft materials, biologic modulators, extracellular matrix,bone morphogenetic proteins. Recently growth factors releasing platelet aggregates - platelet rich plasma(PRP) & platelet rich fibrin(PRF) are also being used.

Platelet-rich plasma (PRP) a first generation platelet aggregate was introduced for the first time by Marx et al. in 1998.[1]

PRP is an autologous source of growth factors obtained by sequestrating and concentrating platelets by gradient density centrifugation [2]

Beta tricalcium phosphate(βTCP) – is a biocompatible, immunologically inert, resorbable osteoconductive bioactive material which forms a scaffold for closing the bony defect - it gets fully resorbed and replaced by vital bone over six months time[3]

Case report :

History & clinical description

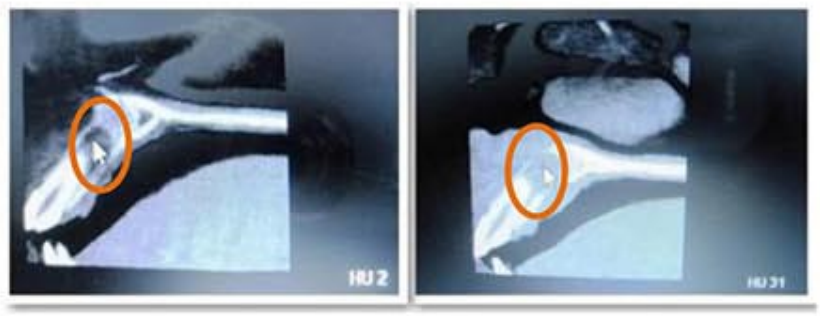
A 20 year old female patient came to our dept. with chief complaints of pain and swelling in relation to upper front teeth for past 1 week and with a history of on/off swelling for the

past one year. Intraoral Examination revealed Ellis class II fracture in 11. Tenderness on percussion elicited in 11,12,21,22.On Electric pulp testing, 11,12,21 22 showed negative response .

Intraoral periapical radiograph(IOPA)showed bilateral periapical radiolucency one in relation to 11,12 and another in relation to 21, 22(fig.1). Cone beam computed tomography(CBCT) was taken to know the exact extent of the lesion &bone density in Hounsfield units(fig.2) and the case was clinically diagnosed as chronic bilateral periapical lesion in relation to non vital 11 12 & 21 22

fig.1

Pre op IOPA – bilateral radiolucency



SURGICAL-HU -2 fig.2 NONSURGICAL HU-31

PRE OP CBCT (SAGITTAL)

Treatment plan:

Under rubber dam isolation root canal treatment was initiated in 11,12, &21, 22.Calcium Hydroxide (Metapex, Meta biomed Co.Ltd.,Korea) Closed dressing was given. On subsequent visit, root canals were dry in 21,22 and were obturated. Drainage was persistant in 11,12. Hence it was planned to do surgical management of 11,12 using PRP + βTCP whereas the 21 22 side (nonsurgical)was kept under observation. Patient consent was taken, complete hemogram was done and all the parameters were found to be within normal limits.

Procedure

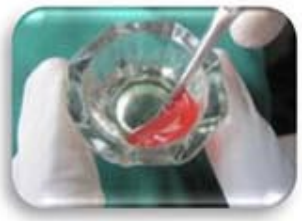
11,12 was obturated on the day of surgery.under local anesthesia,a full thickness mucoperiosteal flap was elevated from 13 to 11,meticulous periapical curettage was done followed by apicectomy and retrograde filling was done with Glass Ionomer Cement (GC Fuji IX)in 11 12.

PRP was prepared prior to the surgical procedure in accordance with the protocol developed by Sonnleitner etal[4] .10 ml of venous blood was drawn from the patient and transferred into two test tubes containing Ethylene diamine tetra aceticacid (EDTA) (Qualigens chem)as an anticoagulant. The blood was centrifuged(Remi-India) at 5000 rpm for 15 min.The blood and plasma formed two layers; the supernatant being plasma.The

plasma was then aspirated with a pipette and transferred to a sterile test tube without anticoagulant. The samples of plasma were subjected to 2nd centrifugation at 2000 rpm for 10 min, which allowed the precipitation of the platelets to fall onto the bottom, while the surface Platelet Poor Plasma(PPP) was discarded.

Just before placing the PRP into the bony defect a small amount of bovine thrombin(Uniplastin, Tulip diagnostics(P)Ltd.) and a few drops of 10% Calcium Chloride(Thermo Fisher Scientific India Pvt.Ltd.)were added to the PRP to form a gel in a few seconds(fig.3)

β TCP



PRP GEL

Fig.3

- PRP was mixed with β –TCP (fig.4) (Sybograf-T, Eucare pharmaceuticals (P) Ltd.) (fig.4)and placed into intrabony defect upto surrounding bone level(fig.5).The postoperative healing period was uneventful.

Fig.4
PRP + β TCP

Fig.5
PLACEMENT INTO BONY DEFECT

6 months and 1 year follow up by CBCT(fig.6) was done to asses bone healing[5](Planmeca Helsinki, Finland). This showed significant bone regeneration on the surgical side (11 12) than the nonsurgical side (21 22) which is very well evident from the Hounsfield units.

Follow up CBCT

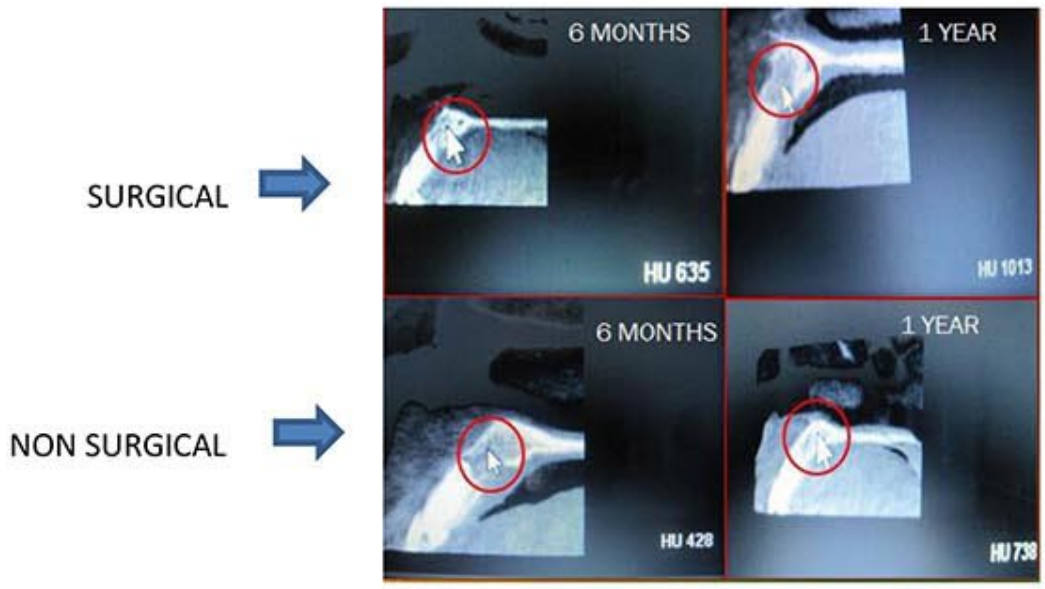


fig.6

Discussion

Abramovitz et al (2002)[6] reported that treatment of 24.5% of cases was not possible without periapical surgery. Petite et al (2000)[7]stated the autologous bone grafts are preferred choice for any regenerative procedure. Saini et al (2011)[8]compared the efficacy of autologous PRP + β TCP versus β TCP alone in treatment of infrabony defects.- showed more linear bone fill in PRP + β TCP combination

In this case as the symptoms were not subsiding even after the orthograde endodontic treatment we opted for the surgical approach. since the size & extent of lesion were almost similar & comparable on both sides bilaterally this case was chosen as an ideal candidate for comparing surgical and nonsurgical treatment outcomes as the ethnic variations and immunological factors are standardized. Regeneration/ periapical healing was significantly better on surgical side than the nonsurgical side as evident by CBCT values

Conclusion

Surgical management proves to be promising treatment option in resolving persistant periapical pathosis. Osseous regeneration was significantly better when PRP & β TCP were used in conjunction with surgical endodontics compared to conventional nonsurgical treatment.platelet aggregates will become as an inevitable part of regenerative endodontics in near future.

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