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ORIGINAL RESEARCH

Role of PRF as an adjunct in the Surgical Management of MRONJ

[1]Dr. Sumera Gul, [2]Dr. Najma Banoo, [3]Dr. Sheikh Tafazul, [4]Dr. Malik Danish Yaseen

[1]Senior Resident, [2,3]PG Student, [4]Junior Resident, Department of Oral and Maxillofacial Surgery, Government Dental College and Hospital, Srinagar, Jammu and Kashmir, India.

Corresponding author: Dr. Sumera Gul
sumeragul667@gmail.com

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Abstract

Background: Medication related osteonecrosis of the jaw (MRONJ) cases are tremendously increasing globally, thereby different treatment modalities are being developed for their successful management.PRF is an autologous matrix scaffold, which helps to regulate inflammation and increases healing process. Hence this study was conducted for evaluating adjunctive role of PRF in surgical management of advanced MRONJ cases. **Material and Methods**: A total of 15 patients with AAOMS stage II and III MRONJ lesions were evaluated and surgically managed with sequestrectomy alone or sequestrectomy /currettage with peripheral ostectomy and adjunctive application of PRF in the residual defect followed by closure. Healing was assessed after a period of 1,3 and 6 month interval under parameters like mucosal closure, presence of infection and radiographic disease progression upto 6 months. **Results**: Out of 15 patients(6 female and 9 male)included in the study,8 had AAOMS Stage III MRONJ and 7 Stage II.10 patients were treated with sequestrectomy alone and remaining 5 underwent sequestrectomy /curettage with peripheral ostectomy.11 patients reported complete mucosal healing whereas 4 experienced incomplete healing. **Conclusion**: Role of PRF as an adjunct in surgically managed MRONJ cases can be considered as a favorable treatment option.

INTRODUCTION:

Medication-related osteonecrosis of the jaw (MRONJ) is a rare but severe debilitating condition in patients who are on certain category of drugs including bisphosphonates, anti-resorptive and anti-angiogenic drugs. The first case of MRONJ was reported by Marx in the early 2000s and According to the American Association of Oral & Maxillofacial Surgeons (AAOMS) MRONJ is defined as “exposure of portion of jaw bone in patients who have been exposed to bisphosphonates other related medication that has persisted for more than 8 weeks with no history of radiation therapy to the jaws”. Such patients usually present with non-healing extraction sockets after tooth extraction or exposed necrotic bone with radiographic evidence of sequestrum formation with/without localised swelling and infection.[2] Due to widespread use of anti-resorptive drugs, the incidence of MRONJ has increased many folds. The treatment of MRONJ is generally challenging, and the strategy for optimal therapy is yet to be established. Various treatment options have been established for alleviating pain and improving the quality of life ranging from conservative to minimally invasive to surgical therapy or a combination of either of the options depending upon the AAOMS staging of the disease.

- The use of PRF in the adjuctive treatment of MRONJ was first reported in 2007. PRF is an autologous matrix scaffold consisting of interwoven fibrin network with

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embedded cells (thrombocytes, leukocytes, and stem cells), including a wide variety of growth factors, cytokines, and proteins.

- The aim of this study was to evaluate the efficacy of PRF as an adjunct in the surgical management of MRONJ.

AIMS & OBJECTIVES:

The objective of this study was to determine the role of PRF as an adjunct in the surgical management of MRONJ patients in terms of overlying mucosal healing, absence of signs of infection and underlying disease progression evaluated by radiographic presentation.

MATERIALS & METHODS:

15 patients were included in this prospective study who reported for oral treatment to the Department of Oral and Maxillofacial Surgery, Government Dental College and Hospital, Srinagar with AAOMS Stage I and Stage II MRONJ lesion requiring surgical management. After taking consent from the patient, they were managed surgically by either sequestrectomy or curettage with peripheral ostectomy followed by placement of PRF in the residual defect and closure.

INCLUSION CRITERIA:

- Patients with Stage I/II Mronj as confirmed by history and clinical /radiographic examination.
- Patients giving consent for the procedure (ASA-I /II).

EXCLUSION CRITERIA:

- Patients with history of radiotherapy to the jaws.
- ASA-III patients not able to give consent.

SURGICAL PROCEDURE

- All surgical procedures were done by the same operator following standard aseptic conditions. Prophylactic antibiotic was given to the patient 30 mins before the procedure. The procedures were carried out under local anesthesia or conscious sedation depending upon the size of the defect. Appropriate nerve block was given using 2% lignocaine hydrochloride with 1:80000 adrenalines.
- Mucoperiosteal flap was elevated and necrotic bone was removed using rotatory burs. The extent of debridement was decided by the preoperative radiographic presentation and intra-operative clinical picture of bone (until fresh bleeding was induced in bone).
- Meanwhile 10-15ml of venous (depending upon the size of defect) blood was collected from the patient and transferred in 2 glass test tubes centrifuged at 3000 rpm for 10 mins for preparation of PRF which was then transferred into the defect. The defect was then sutured with 3-0 silk sutures. Post-operative instructions were given and all patients were prescribed following medications:

  • Cap. Amoxicillin & Clavulanic acid 625 mg 12 hourly for 5 days
  • Tab. Diclofenec Sodium 50 mg 12 hourly for 5 days
  • Tab. Pantoprazole 40 mg once daily for 5 days.

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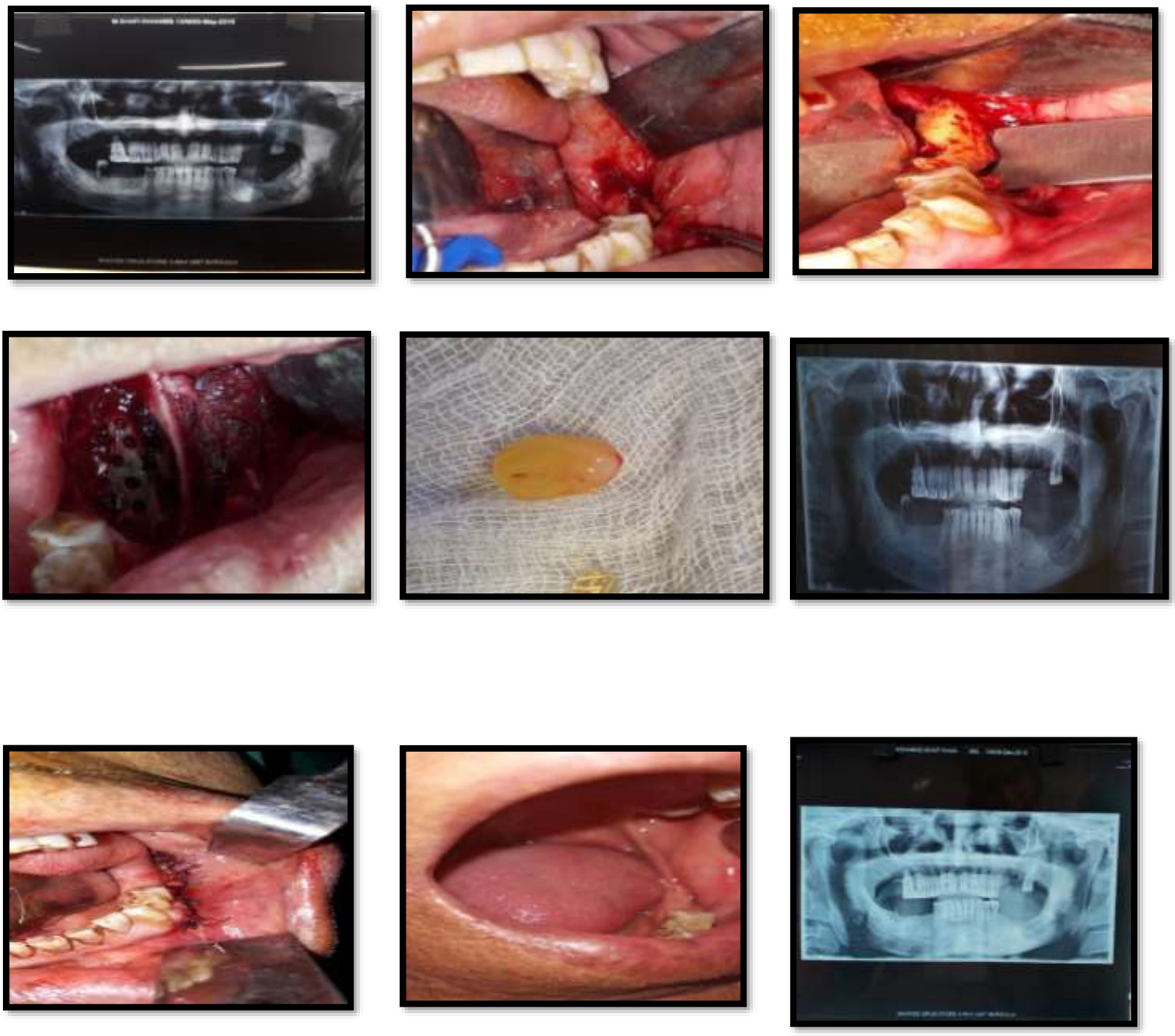
All patients were recalled after 10 days for suture removal and follow-up.



Schematic illustration of surgical procedure (Sequestrectomy) followed by placement of PRF and soft tissue closure with post-operative OPG's after 3month and 6month follow-up.

RESULTS:

- Total 15 patients were included in the study, out of which 6 were female and 9 were male. The mean age of the patients was 51.3 years (45-69 years). Out of 15 lesions detected 7 had AAOMS Stage I MRONJ and 8 Stage II MRONJ. 9 out of 15 patients

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were on monthly infusions of Zoledronic acid, and rest had already received the chemotherapy.

- Mandible was the most common site of MRONJ with unhealed extraction socket as the commonest presentation followed by exposed necrotic bone & pus discharge from exposed site. 10 out of 15 patients underwent sequestrectomy alone as treatment whereas remaining 5 patients were managed with curettage followed by peripheral ostectomy. Residual defects in all 15 patients were filled with PRF and closed by suturing.
- Healing was assessed after a period of 1,3 and 6 month interval under parameters like mucosal closure, presence of signs of infection and radiographic disease progression upto 6 months. Out of 15 patients 8 patients(53%) showed complete mucosal healing after 6 months with non-exposed bone & no signs of infection. 3 patients(20%) showed soft tissue dehiscence without signs of infection after 3 months whereas remaining 4 patients(27%) showed exposed bone with pain and pus discharge after 1 month.

DISCUSSION:

- Since the initial description of medication-related osteonecrosis of the jaw (MRONJ) almost two decades ago, the potential pathophysiology and risk factors have been elaborated on in many investigations and guidelines. However, the definitive pathophysiology based on scientific evidence remains lacking. Consequently, the optimal clinical treatment and prevention strategies for MRONJ have not been established. Despite their different mechanisms of action, many drugs, including bisphosphonates, denosumab, angiogenesis inhibitors, and other medications, have been reported to be associated with MRONJ lesions in cancer and osteoporosis patients. Importantly, MRONJ occurs predominantly in the jawbones and other craniofacial regions, but not in the appendicular skeleton.[8]
- Platelet-rich fibrin (PRF) is a simple, efficient, and minimally invasive method of obtaining a natural concentration of autologous GFs. The rationale for the widespread use of PRF in the healing process of such varied tissue types resides in the fact that platelets represent an early accessible reservoir of critical GFs and other signaling molecules, including leukocyte-derived catabolic cytokines and fibrinogen, which may govern and regulate the tissue-healing process. This milieu of bioactive molecules contributes to a well-orchestrated tissue-healing response to injury, which proceeds sequentially through the inflammatory, reparative, and remodeling phases of wound healing.[8- 10] hence; the present study was conducted for evaluating the adjunctive effect of PRF in the treatment of MRONJ.

- In our study, we evaluated that 53% of patients reported with mucosal healing without signs of infection after a follow-up period of 6 months whereas 20% presented with soft tissue dehiscense with exposed bone after 3 months and 27% of patients reported back with exposed necrotic bone with pain and pus discharge after 1 month follow – up.
- Our study was in accordance with the study conducted by Guilherme Klein Parise et al and similar other such studies which proved PRF to ba a useful adjuctive along with surgical therapy for management of MRONJ.

CONCLUSION:

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- PRF is cheap, safe, autologous, and easy to prepare adjunctive treatment option for MRONJ patients reducing the risk of delayed recovery after surgical management of such patients.

LIMITATIONS OF THE STUDY:

- Small sample size was selected.
- Underlying oncological/non-oncological disease condition was not considered.
- Adjuvant drug therapy in different patients was not considered.

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