

Block Grafting In Periradicular Surgery- A Case Report with One-year Followup.

Abstract:

One of the most difficult problems in dentistry is the diagnosis, treatment, and prognosis of endodontic-periodontal lesions. Primary endodontic lesions are the most common form of endo-perio lesions, which has been associated with resorption of the surrounding periapical bone and attachment apparatus degradation. Conventional root canal therapy is the preferred method of treating such an infection. Surgery is frequently the next line of management when this treatment has failed or is not feasible. Success rate following peri-radicular surgery is approximately 75%. In cases involving extensive periradicular lesions, bone grafting is often required to promote optimal healing. Among the various grafting options, autografts are considered the gold standard due to their osteogenic potential. This case report is about the novel management of large periapical lesion using para symphysis block graft along with clinical and radiographic follow up of one year.

Key-words: periapical diseases, root canal therapy, bone grafting

Introduction:

One of the most difficult problems in dentistry is the diagnosis, treatment, and prognosis of endodontic-periodontal lesions.[1] Primary endodontic lesions are the most common form of endo-perio lesions.[2] Loss of function, pain to percussion or palpation, subjective discomfort, mobility, sinus tract formation, infection or swelling, and the formation of periodontal pockets are all evaluated using standard clinical examination protocols.[3]

The development of peri-radicular lesion appears to be dependent on the existence of live bacteria in the root canals. Conventional root canal therapy is the preferred method of treating such an infection. Surgery is frequently the next line of management when this treatment has failed or is not feasible. Surgical therapy is typically performed on teeth that has already underwent root fillings.[4] Large bone destructions caused by periradicular lesions should be filled with effective bone-replacing materials during regenerative tissue process. Among various bone grafting materials, autografts are the gold standard due to its superior osteogenic properties.[5]

This case report is about the novel management of large periapical lesion using para symphysis block graft along with clinical and radiographic follow up of one year.

Case report:


A 25-year-old male patient reported to the Department of Periodontology with the chief complaint of pain in the lower front teeth region for the past one month. The patient revealed a history of trauma to the lower front teeth before seven years. Intraoral examination revealed Ellis class II fracture in tooth

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#41, tender on percussion, Grade I mobility and positive fremitus test was noted in #32, 31 and 41. Soft tissue examination revealed a soft, smooth, reddish and fluctuant alveolar mucosa with pain in relation to tooth #31 [Figure 1]. Intraoral periapical radiograph (IOPA) reveals loss of lamina dura and ill-defined radiolucency in the peri apex of teeth #32, 31 and 41 [Figure 2]. Vitality testing showed no response in teeth #32, 31 and 41. The final diagnosis was made as Primary endodontic with secondary periodontal lesion in teeth #31 and 41.



Figure 1: Preoperative view



Figure 2: Preoperative IOPA

Complete ultrasonic scaling was done and occlusal adjustments were undertaken. Root canal treatment was done in relation to teeth #32, 31 and 41. Antibiotics and analgesics were prescribed for five days. Six weeks later, the patient reported with pain and swelling in the lower anterior region. Since it was an acute exacerbation of chronic periapical lesion with definite radiolucency as confirmed in IOPA, the need for CBCT was precluded and direct surgical exploration was planned.

Under local anesthesia, submarginal incisions were placed in relation to the mucogingival junction in relation to teeth #33-43. Full thickness mucoperiosteal flap elevation was done to reveal a periapical lesion of around 10 × 8 mm in size [Figure 3].



Figure 3: Submarginal incision and flap reflection

Complete debridement of the lesion was carried out. Over the course of the surgery, the region was periodically washed with saline solution to avoid bone dehydration and necrosis. Root end resection and root end filling was done using Type II Glass Ionomer Cement in teeth #32, 31 and 41 [Figure 4].



Figure 4: Debridement completed

Block bone graft of 8mm×6 mm in size was procured in relation to the parasymphiseal region of teeth #33 & 34 using Piezo surgery [Figure 5 & 6].

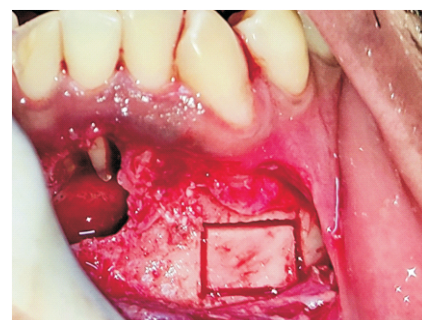


Figure 5: Procurement of block graft using piezosurgery

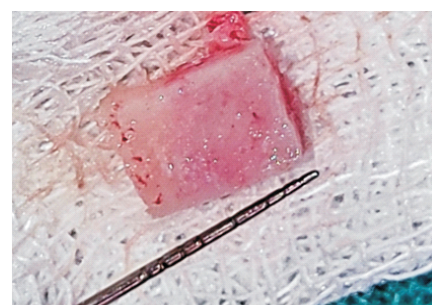


Figure 6: Procured Block graft

The block graft was placed inside the defect as it is well contained, there was no need for stabilization. The donor site was managed using bone wax [Figure 7]. Flaps were approximated using simple interrupted sutures with 3-0 Black silk [Figure 8]. Periodontal dressings were placed at the surgical site.



Figure 7: Block graft placed in to the recipient site and covered with PRF membrane. Donor site managed using bone wax



Figure 8: Flap approximated using simple, interrupted sutures.

Postoperative instructions were given. Antibiotics (Augmentin 625 mg, 1 tablet every 12 hours for 5 days) and analgesics (Aceclofenac 100mg+ Paracetamol 325 mg, 1 tablet every 8 hours for 3 days) were prescribed. Sutures were removed after 10 days. The patient was recalled and reviewed periodically for one year. The patient remained symptom free with satisfactory healing in one-year post-operative review [Figure 9]. Intraoral periapical radiograph reveals radio-opacity surrounding the apex of teeth #32, 31 and 41 [Figure 10].



Figure : Postoperative view at 1 year



Figure 10: Postoperative IOPA at 1 year.

Discussion:

An endodontically treated tooth with a persistent periapical disease is frequently saved by peri-radicular surgery as a last option. Tooth retention following peri-radicular surgery after 10 years is approximately 75%. [6] Zuolo *et al.* [7] conducted a prospective clinical study on peri-radicular surgery and reported a success rate of 91.2% when adhered to strict endodontic surgical protocol. The post-operative use of antibiotics have been prescribed to eliminate bacteria from the persistent infection. [8]

The ideal root-end filling material should be biocompatible and bactericidal. MTA for root-end filling showed higher success rate in peri radicular surgery. [9] Jesslen *et al.* [10] reported complete healing in 85% of the cases with GIC as the root end filling material at the 5-year follow-up. Hence in the absence of MTA, Glass ionomer cement can be selected as the root-end filling material.

According to 2020 guidelines for periradicular surgery, presence of large periapical radiolucency of greater than 5mm in diameter provides less favourable prognosis. [11] Hence, bone grafts are necessary when there is large destruction of buccal bone plate circumjacent to the periapical lesion. The use of bone substitutes in periradicular surgery has been indicated for the successful management of these cases. [5]

Dietrich *et al.* [12] obtained good results after 12 months with the application of GTR using inorganic bovine bone mineral and bioabsorbable collagen membrane in periradicular surgery. Singh *et al.* [13] reported that the application of PRF promoted faster wound healing when used in the management of periapical lesions.

Autografts are the gold standard of bone grafts due to its osteogenic potential. Among various methods to procure bone grafts, piezosurgery is the least invasive method. It generates microvibrations that precisely cuts only the alveolar bone with seldom damage to the root and soft tissues.[14]

No cases reported till date utilized block grafting in periradicular surgery to promote bone regeneration at the periapex. Parasymphysis region provides dense cortical with coarse trabecular type density of the bone, with a rich source of osteogenic cells for promoting bone regeneration.[15] In this case, block graft procurement was carried out from the parasymphysis region as it eliminated the need for the second surgical site.

Although block graft procurement can be undertaken with a variety of instrument, piezo surgery provides optimal precision with minimal tissue trauma. Bone regeneration at the donor site is favoured by the typical series of physiological healing events that occur in response to surgical injury, a regionally accelerated process.[15]

Conclusion:

Block grafting shows promising results when used as an adjunct in periradicular surgery for the management of primary endodontic secondary periodontal lesions, as it enhances tissue regeneration and improves clinical outcomes.

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