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Root coverage by connective tissue graft using pouch and tunnel technique: A case report

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Abstract
Gingival recession is a frequently faced problem in day to day dental practice. Though Phase I therapy is rendered to remove any triggering local factor, a definitive correctional procedure is needed for regeneration of the damage. Here a case report is presented wherein a case of active gingival recession was treated successfully by connective tissue graft using Pouch and Tunnel technique. The case was identified, selected and surgery was conducted in the Department of Periodontics, Dr R. Ahmed Dental College and Hospital, Kolkata.

Keywords: Gingival recession, connective tissue graft, pouch and tunnel technique

Introduction

Gingival recession [1], by definition, is the exposure of the root surface by apical shift in the position of gingiva. During periodontal examination it is important to record data accurately. Degree of recession is measured with a probe from CEJ to the gingival crest. It should be kept in mind that recession refers to location of gingival, not its condition. Factors associated with recession can be faulty brushing, tooth malposition, gingival inflammation, and abnormal frenum [2]. The denuded root surface leads to sensitivity due to exposed cementum, makes the tooth susceptible to caries, and as the attached gingiva is lost, the oral hygiene maintenance, especially tooth brushing, becomes difficult due to loss of vestibular space.

Gingival recession was classified by Miller (1985) [2] into four catagories

Class I: Marginal tissue recession does not extend to muco-gingival junction. There is no loss of bone or soft tissue in the interdental area.

Class II: Marginal tissue recession extends to or beyond muco-gingival junction. There is no loss of bone or soft tissue in the interdental area.

Class III: Marginal tissue recession extends to or beyond mucogingival junction. There is moderate loss of bone and soft tissue in interdental area.

Class IV: Marginal tissue recession extends to or beyond mucogingival junction. There is severe loss of bone and soft tissue in interdental area with tooth malposition

Gingival recession can be treated by periodontal plastic surgery. Techniques for gingival augmentation coronal to the recession (root coverage) can be considered. There have been many different approaches for root coverage, like

1. Free gingival graft,
2. Free connective tissue graft,
3. Pedicle flap
   - Lateral,
   - Coronal
4. Sub-epithelial connective tissue graft
5. Guided tissue regeneration
6. Pouch and tunnel technique

This article describes management of a gingival recession with pouch and tunnel technique, which presents the benefits like minimal incision and reflection, and stable blood supply to flap [5].

Case report

A patient, 32 yrs, male, presented with the complaint of stains in teeth along with sensitivity to hot and cold food items in the upper left front tooth for two months in the Dept of Periodontology, Dr R Ahmed Dental College & Hospital, Kolkata. On examination it was found a calculus and debris score of 2 and gingival recession of 2 mm in upper left central incisor (Fig 1). Phase I Therapy was performed over a period of two weeks. The problem of sensitivity persisted and gingival recession did not resolve in the maxillary left central incisor. The problem of an actively receding gingival margin required surgical intervention. Keeping in mind that the tooth to be treated was upper central incisor aesthetics was given a priority in the treatment plan. A connective tissue graft was the preferred over free gingival graft as the latter may produce an un-aesthetic contrast.

The Pouch and Tunnel technique [3] was taken into consideration as the technique minimises incisions and reflection of flaps. This provides abundant blood supply to the sub epithelial donor connective tissue placed into pouches beneath papillary tunnels and allows intimate contact of donor and recipient tissue. This technique is more effective in anterior maxilla where vestibular depth is adequate and gingival thickness is good. The main advantage is the thickening of the gingival margin after healing. The thicker gingival margin is stable to allow the possibility of reattachment of the margin.

After proper sterilization of the armamentarium (Fig 2), and maintaining the proper aseptic condition (Fig 3), the surgery was initiated with the administration of infiltration anaesthesia by lignocaine with adrenaline 1:80000 in the donor and the recipient sites (Fig 4). The right side of the palate was chosen as the donor site. An acrylic cover plate was prepared specifically for the patient prior to surgery.

A sulcular incision was made around the tooth adjacent to the recession using a no.15 BP blade (Fig 5). This incision separates the junctional epithelium and the connective tissue attachment from the root. Using a Gracey curette no 1 a tunnel was created beneath the adjacent papillae, into which the connective tissue was to be placed. A split thickness pouch was created apical to the papillae, and the adjacent radicular surface (Fig 6). The size of the pouch, including the area of the denuded root surface, was measured using a tin foil as template, so that equivalent size of donor tissue could be procured from the palate (Fig 7). The tin foil template was placed in the right side of the palate opposite the right first premolar tooth extending upto the mesial aspect of the first molar (Fig 8). The connective tissue graft was then harvested using the Trap Door technique (Fig 9). The donor site was sutured using 3-0 vicryl sutures and the acrylic cover plate was placed in the palate to cover and protect the defect (Fig 10). The acquired connective graft was preserved on ice for a while till it was placed in the recipient site. Using tissue forceps the connective tissue was placed under the pouch and tunnel (Fig 11), with a portion covering the denuded root surface in the recipient site (Fig 12). The mesial and distal ends were secured with 3-0 vicryl sutures. Gingival margin of the flap was coronally placed and secured with horizontal mattress sutures extending beyond the contact of adjacent teeth. Other holding sutures were placed through the overlying gingival tissue and donor tissue to the periosteum, in order to stabilize the graft tissue (Fig13). Periodontal dressing, Coe-Pak was placed in the recipient site. The patient was prescribed anti-inflammatory drugs and antibiotics, and instructed to follow soft cold diet for a week. The patient was recalled after two weeks for review.

Fig 1

Fig 2

Fig 3

Fig 4

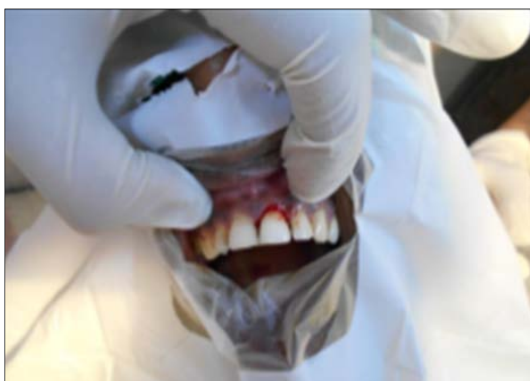

Fig 5

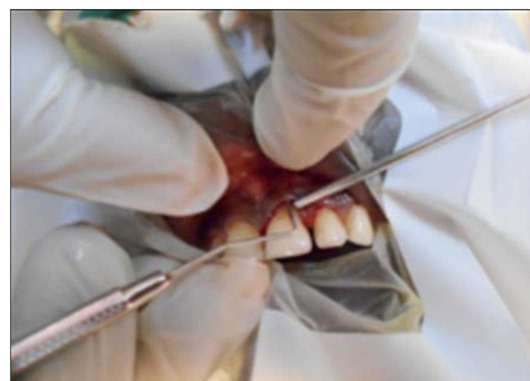

Fig 6

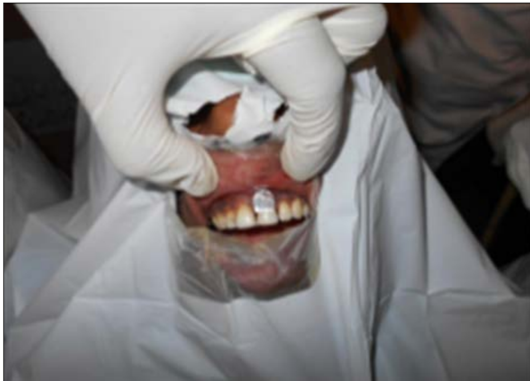

Fig 7

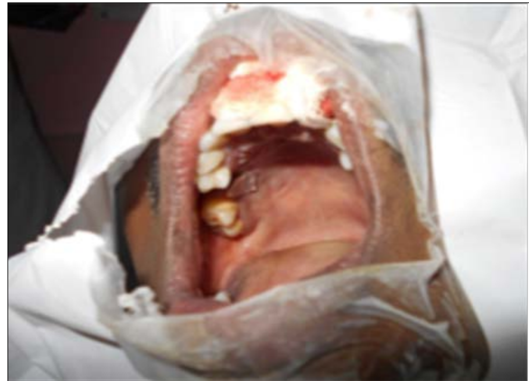

Fig 8

Fig 9

Fig 10

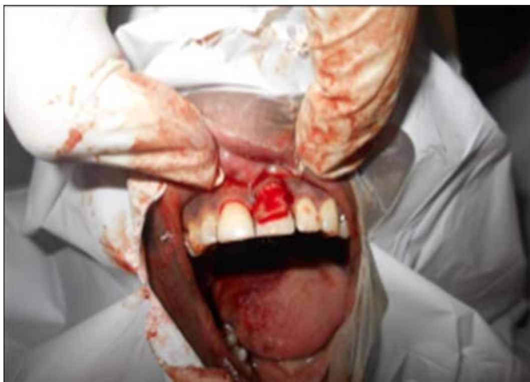

Fig 11

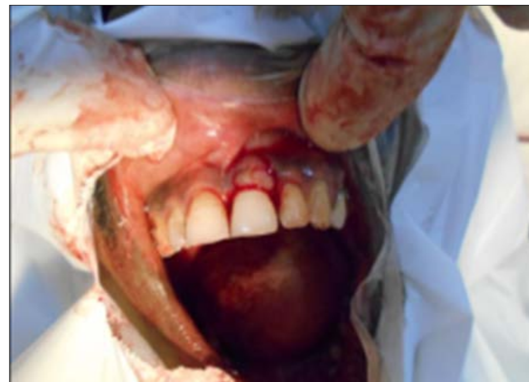

Fig 12

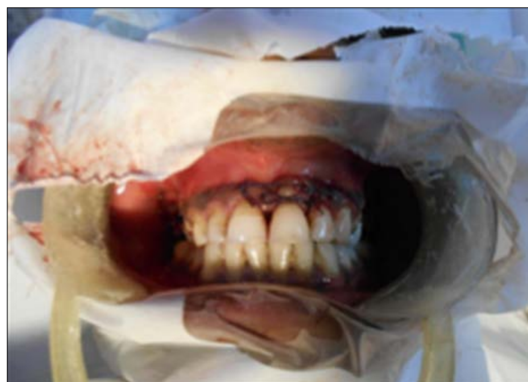

Fig 13

Discussion

In the given case report the procedure of sub-epithelial connective tissue grafting combined with pouch and tunnel technique did not involve the papilla adjacent to the recession. This gave an added advantage over maintenance of aesthetics compared to large pedicle flaps which require the severance of the papilla base. Additionally, preparation of pouches beneath papillary tunnels allows intimate contact of donor tissue and recipient bed [5]. Furthermore, the choice

of connective tissue as a graft gave a homogenous colour match compared to use of epithelial tissue grafts [5].

The procedure yielded successful results with good healing, homogenous colour match and absence of any surgical incision or suture marks leading to overall patient satisfaction.

Conclusion

Keeping in mind the widespread occurrence of gingival recession and the associated aesthetic concern of patients, the pouch and tunnel surgical technique may be beneficial in meeting the demands of the patients both in function and aesthetics.

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