

Acellular Dermal Matrix Allograft for the Treatment of Gingival Recession: Case Reports with 10 Years of Follow-up

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ABSTRACT

Root coverage procedures using various autogenous pedicle and free gingival grafts have been commonly used in periodontics. Recently, a substitute for palatal donor tissue in gingival augmentation procedures has been introduced which is acellular dermal matrix allograft (ADMA). This study was undertaken to examine the potential of ADMA to be used as a substitute for autogenous connective tissue graft material in root coverage procedures in cases with Miller's class I recession defects. Within the limitations of the clinical observations, it is suggested that ADMA can be used as a substitute to free autogenous grafts but, further clinical and histological studies would be necessary to understand the healing process of the surgical wound.

Keywords: Acellular dermal matrix allograft, Alloderm, Attached gingiva, Recession.

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INTRODUCTION

Periodontal plastic surgical procedures consist of various mucogingival procedures. The primary goal of these procedures is enhancement of periodontal health through reconstruction of lost hard and soft tissues, or by preventing its additional loss, also increasing esthetic appearance. Successful coverage of exposed roots for various reasons like esthetic as well as functional needs has been the primary objective of various mucogingival procedures. Presence of gingival recession can lead to inadequate plaque control, root caries, dentinal hypersensitivity and various other esthetic problems. Also, it has been observed that the absence of adequate zone of the attached gingiva in areas of gingival recession may render the area more vulnerable to infection. So, it represents a significant concern to the patients and therapeutic problem for the clinicians. Hence, in order to restore the supporting tissues and to further maintain the normal health, there is a need to obtain predictable root coverage.^{1,2} Several periodontal plastic surgeries have been proposed for the treatment of gingival recession which can be classified as pedicle soft tissue graft procedures (advanced or rotational), or free soft tissue graft procedures (epithelialized graft or subepithelial connective tissue graft). The rotational flap procedures involve the laterally sliding, double papilla and oblique rotated flaps whereas the advanced flap procedures include the coronally advanced and semilunar coronally advanced flaps. Besides these procedures, treatment modalities like guided tissue regeneration (GTR) and alloderm have also been used to obtain coverage of partially denuded root surface.

An acellular dermal matrix allograft (ADMA) was introduced as a substitute for autogenous connective tissue graft material in various periodontal procedures. It is a special skin preparation from which the targets of rejection response, i.e., cell components are removed.² The resultant graft is an acellular dermal matrix with organization of normal collagen bundling and an intact basement membrane complex. The special qualities of ADMA make it suitable permanent dermal transplant *in vitro*. Moreover, clinical studies also suggest that ADMA is an acellular, nonimmunogenic scaffold that heals by repopulation and revascularization rather than through granulation process which leads to scar formation.³ The purpose

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of this report is to describe the potential use of ADMA for a root coverage procedure in a case with moderate gingival recession and reduced attached gingiva where it is used as a substitute for free connective tissue autograft.

CASE DESCRIPTION

The present case reports included two patients who had been referred to the Department of Periodontology, Manipal University, in 2008, for the treatment of mucogingival defect (exposed roots). Both were males aged 22 and 35 years respectively. Clinical evaluation revealed that the patients had isolated Miller's class I gingival recession defect on the buccal surface of mandibular teeth (Figs 1 and 2). All the teeth involved were vital and has not received previous periodontal surgical therapy. Both patients were in good health with no contraindications to periodontal surgery. Complete blood and radiographic investigations were done for both the patients. Both the patients had presence of a buccal recession of 3 mm, was measured by calculating the distance between the cemento-enamel junction and gingival margins. Patients were maintaining good plaque control and absence of gingivitis before surgery.



Fig. 1: Isolated Miller's class I gingival recession defect w.r.t. 34



Fig. 2: Isolated Miller's class I gingival recession defect w.r.t. 31



Fig. 3: Complete (100%) coverage of root surface in isolated recession w.r.t. 34 at 3 months postoperatively



Fig. 4: Complete (100%) coverage of root surface in isolated recession w.r.t. 31 at 3 months postoperatively

Surgical Procedure

Following local anesthesia (2% lignocaine, epinephrine 1:100,000), the exposed root surface was thoroughly planned with the use of hand instruments and the surgical site was prepared. An acellular dermal matrix allograft was aseptically rehydrated for 12 minutes, according to manufacturer's guidelines. After flap reflection, the graft was placed and trimmed to a shape and size designed to cover the root surface and at least 2 mm of the adjacent bone on each side of the root. The graft was secured to the wound bed and flap was coronally positioned with a sling suture using 3-0 silk suture.

The patients were instructed to rinse twice daily with 0.2% chlorhexidine digluconate solution for 4 weeks postoperatively and to avoid trauma or pressure at the surgical site. Systemic analgesics were prescribed and he was advised to follow postoperative instructions. The dressing and the sutures were removed 10 days postoperative. The patients were monitored at 1-month intervals for 6 months, and were being followed up for 10 years.

Clinical Observations

In both cases there was no postoperative discomfort or adverse reaction and healing was uneventful. Though ADMA was exposed to oral environment, yet this situation didn't appear to clinically affect the healing and no graft material was exfoliated. Initially after 1 week postoperatively, the allograft appeared whiter than gingiva. At 1 month postoperatively, the gingiva at the surgical site was still edematous and at certain points, granulation tissue could be observed. Normal appearance was established at

2 months postoperatively. At 3 months postoperatively, there was complete (100%) coverage of root surfaces (Figs 3 and 4). Also, significant gain in the width of attached gingiva and increase in quantity of keratinized tissue was achieved. The gingiva appears to be thicker and was firmly attached as could be seen when the alveolar mucosa was stretched. These results are still maintained over the period of 10 years follow-up and patients are still on for supportive periodontal therapy.

DISCUSSION

The goal of this clinical procedure was to investigate the long-term use of ADMA as a substitute for gingival or palatal grafts in root coverage procedures. Covering of denuded root surfaces and increasing width of attached gingiva are routinely done using free gingival or connective tissue grafts. Recent published reports claim 52–98% root coverage with 27–89% of treated teeth showing complete coverage. The present results of 100% root coverage in both cases are compared to the 80% that has been observed by Hirach et al. and Buduneli et al.^{4,5}

Allograft material, especially skin preparations, was used for gingival augmentation procedures whose main advantage is absence of the undesirable dead cells with their associated class I and II HLD antigens and potential transmission of cell associated viruses. Also, ADMA has essentially undamaged collagen and elastin matrices which makes it completely biocompatible. These qualities are essential in sites of cosmetic surgery where the inflammatory

response associated with dead cell removal or repair of damaged structures and responses to HLA incompatibilities in skin allografts is reduced.^{6,7}

The results presented here indicate that recession defect coverage is extremely predictable and sustained over a 5-year period when ADMA is used as a graft material. The use of ADMA precludes the need of a second surgical site, thus avoiding postoperative discomfort and risks such as bleeding. Also, offers unlimited donor tissue availability and reduces multiple surgeries. Clinically handling, trimming, adaptability and suturing of graft are almost like autologous connective tissue graft.

The present clinical observation cannot shed light on the biological rationale behind the healing of present surgical wound. Based on reports, firstly, matrix is revascularized via preserved vascular channels and it integrates into host tissue. Secondly, ADMA was also used as a barrier between the gingival connective tissue on one side and the exposed bone, periodontal ligament, and root surface on the other, thus using principles and advantages of guided tissue regeneration technique. These cases were not meant to investigate biological aspects, however, if one examines the literature to this point, in the area of recession coverage and gingival augmentation with ADMA, this report compares well in most of these cases.

CONCLUSION

Because patients today are more aware of esthetics, surgeons and restorative dentists must be cognizant of periodontal plastic surgery procedures that can enhance their results and should also expand the variety of procedures offered by them. The use of ADMA as a graft material for recession defects coverage produced excellent results in the present study. In conclusion, within the limits

of this study, we believe that the acellular dermal matrix allograft has special advantages (for example, it eliminates donor site morbidity, offers unlimited availability of tissues and reduces the need of multiple surgeries) that seem to be promising for periodontal plastic procedures for recession defects. Therefore, this graft material should be considered as an alternative treatment in patients with receded gingiva to increase the width of attached gingiva.

REFERENCES

1. Cummings LC, Kaldahl WB, Allen EP. Histologic evaluation of autogenous connective tissue and acellular dermal matrix in humans. *J Periodontol* 2005;76(2):178–186. DOI: 10.1902/jop.2005.76.2.178.
2. Tal H. Subgingival acellular dermal matrix allograft for the treatment of gingival recession: a case report. *J Periodontol* 1999;70(9):1118–1124. DOI: 10.1902/jop.1999.70.9.1118.
3. Harris RJ. Clinical evaluation of 3 techniques to augment keratinized tissue without root coverage. *J Periodontol* 2001;72(7):932–938. DOI: 10.1902/jop.2001.72.7.932.
4. Hirsch A, Goldstein M, Goultschin J, et al. A 2-year follow-up of root coverage using subpedicle acellular dermal matrix allografts and subepithelial connective tissue autografts. *J Periodontol* 2005;76(8):1323–1328. DOI: 10.1902/jop.2005.76.8.1323.
5. Buduneli E, Ilgenli T, Buduneli N, et al. Acellular dermal matrix allograft used to gain attached gingiva in a case of epidermolysis bullosa. *J Clin Periodontol* 2003;30(11):1011–1015. DOI: 10.1034/j.1600-051X.2003.00398.x.
6. Fowler EB, Breault LG, Rebitski G. Ridge preservation utilizing an acellular dermal allograft and demineralised freeze-dried bone allograft: part II. immediate endosseous implant placement. *J Periodontol* 2000;71(8):1360–1364. DOI: 10.1902/jop.2000.71.8.1360.
7. Andrade PF, Souza SLS, Macedo GO, et al. Acellular dermal matrix as a membrane for guided tissue regeneration in the treatment of class ii furcation lesions: a histometric and clinical study in dogs. *J Periodontol* 2007;78(7):1288–1299. DOI: 10.1902/jop.2007.060325.