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# Treatment of Miller's Class I Recession Defects with Acellular Dermal Matrix - A Case Series

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## ABSTRACT

Gingival recession is an important esthetic and functional concern. A wide variety of root coverage procedures have been described for the treatment of periodontal recession defects. Since subepithelial connective tissue grafts are harvested from the palate, they increase the patient discomfort as an additional surgery is needed, which might be discomforting to the patient and the amount of donor material which is necessary limits the number of teeth that is to be treated with a single surgery. Therefore, various biomimetic materials have been advocated for the treatment of recession defects. One of the treatment modalities is the use Acellular dermal matrix allografts. A total of 2 cases were included in this case series diagnosed with Miller's class I gingival recession defect. In both the patients Acellular dermal matrix allograft was used in conjunction with coronally advanced flap for the treatment of recession defects. Both the patients had an uneventful healing and are on follow-up periods of 3 months. The result obtained from this study indicated that Acellular dermal matrix with coronally positioned flap can be successfully used to treat periodontal recession defects and can also be used to increase the gingival biotype.

Both the cases yielded a positive result giving almost complete root coverage.

**Keywords**

Root coverage, Acellular dermal matrix, Miller's Class I, Coronally advanced flap.

**INTRODUCTION**

Gingival recession is defined as the exposure of root surfaces due to the apical migration of the gingival margin.[1]Gingival recession is an important aesthetic and functional concern. It is often associated with loss of cementum and alveolar bone which ultimately leads to apical migration of the gingival margin.[2]There are several mucogingival surgical procedures which have been proved successful, but the common procedures which are used ineveryday practice are pedicle soft tissue graft and free soft tissue graft procedures.

A wide variety of root coverage procedures have been described for the treatment of periodontal recession defects. In a systematic review by Chambrone et al., it has been reported that sub-epithelial connective tissue graft with coronally advanced flap is considered as the gold standard in grafting procedures as it provides substantial root coverage, clinical attachment and keratinized tissue gain.[3]

Since subepithelial connective tissue grafts are harvested from the palate, they increase the patient discomfort as an additional surgery is needed, which might be discomforting to the patient and the amount of donor material which is necessary limits the number of teeth that is to be treated with a single surgery.Therefore, various biomimetic materials have been advocated for the treatment of recession defects.

One of the treatment modalities is the use Acellular dermal matrix allografts. They have been used in periodontal plastic surgeries since 1994. ADM has the properties of native extracellular matrix which promotesdifferentiation and regeneration of lost periodontal tissues. It does not contain any cells to prevent immune rejection.ADM has been used in the management of the single and multiple recession defects, for increasing the width of the attached gingiva, gingival ridge augmentation procedures and vestibular extension procedures.[4]

**CASE REPORT - 1**

A 47 years old female reported to the department of Periodontics, at ITS Dental College, Hospital and Research Centre, Greater Noida with a chief complaint of receding gums in the upper right front tooth region since 3 years. On examination Miller's Class I recession defect was found in relation to 13 which measured 3mm x 4mm. (figure 1 a) The colour of the gingiva was pale pink.Thorough scaling and root planing was done 1 week prior to the procedure. After 1 week, on the day of the surgery, the gingiva was firm and resilient. Prior to therapy, clinical measurements including probing depth, recession depth, clinical attachment level (CAL) were obtained using a UNC 15 probe. Patient reported with adequate width of attached gingiva and vestibular depth. After recording all the clinical parameters, the treatment of choice was a coronally advanced flap with acellular dermal matrix. (figure 1b, 1c and 1d) Procedure was performed under local anaesthesia. The surgical site was sutured with Vicryl 5-0. Healing was uneventful. (figure 1e)

Figure 1a. Pre-operative picture of Miller's class I recession defect with respect to 13

Figure 1b. Placement of Acellular dermal matrix in the recession defect

Figure 1c. Acellular dermal matrix sutured with the help of Vicryl 5-0 suture

Figure 1d. Immediate post-operative

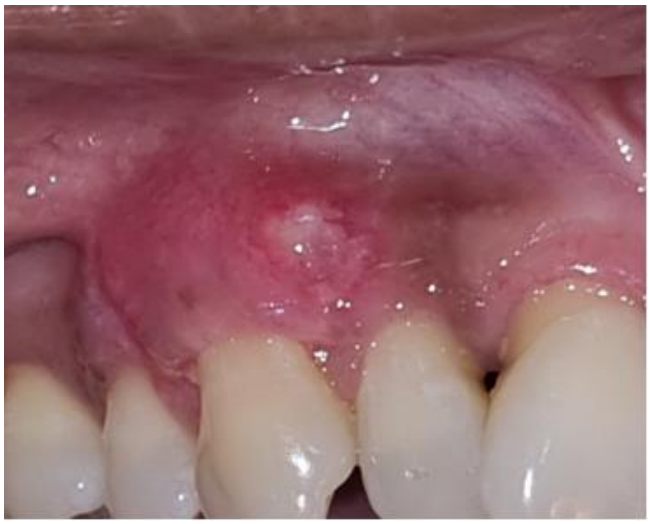

Figure 1e. Post-operative after 2 weeks

**CASE REPORT- 2**

A 37years old male reported to the department of Periodontics, at ITS Dental College, Hospital and Research Centre, Greater Noida with a chief complaint of receding gums in the upper right front tooth region since 3 years. On examination Miller's Class I recession defect was found in relation to 13 which measured 3mm x 4mm. (figure 2a).There was generalized gingival inflammation. Bleeding on probing was generalized present. Thorough Phase I therapy (scaling and root planning) was done 1 week prior to the procedure. After 1 week, on the day of the surgery, the gingiva was firm and resilient. Prior to therapy, clinical measurements including probing depth, recession depth, clinical attachment level (CAL) were obtained using a UNC 15 probe. Patient reported with adequate width of attached gingiva and vestibular depth. After recording all the clinical parameters, the treatment of choice was a coronally advanced flap with acellular dermal matrix. (figure 2b and 2c).The procedure was performed under local anaesthesia and the Vicryl 5-0 sutures were used. The healing was uneventful. (figure 2d and 2e).

Figure 2a. Pre-operative picture of Miller's class I recession defect with respect to 13

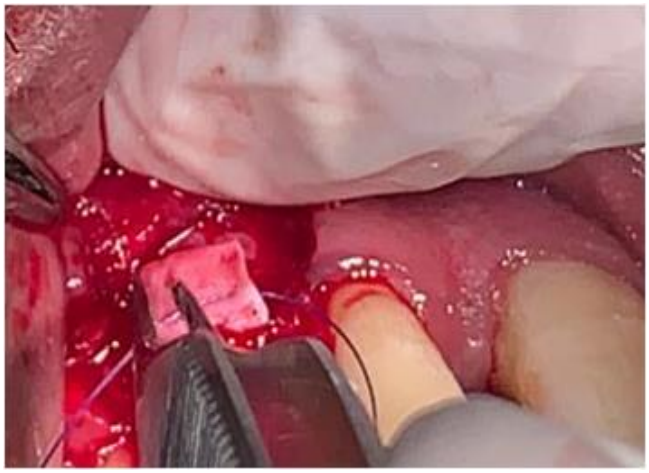

Figure 2b. Placement of Acellular dermal matrix in the recession defect

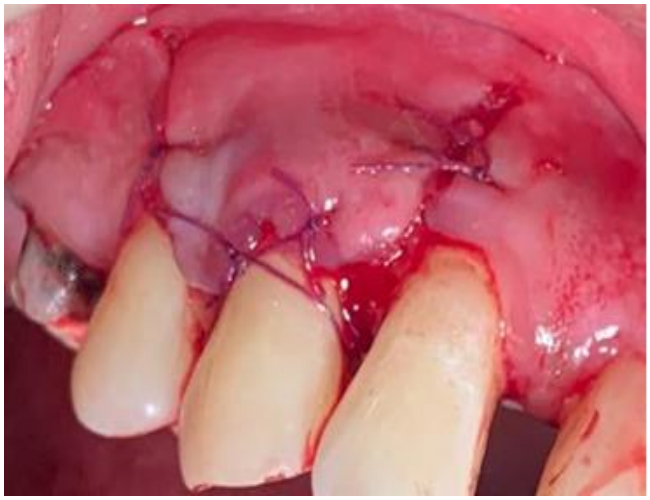

Figure 2c. Immediate post-operative

Figure 2d. Post-operative after 1 week

Figure 2e: Post operativeafter 3 months.

**DISCUSSION**

In this case series, Novomatrix was used in the treatment of isolated Miller's class I gingival recession defects. The result obtained from this study indicated that Acellular dermal matrix with coronally positioned flap can be successfully used to treat periodontal recession defects and can also be used to increase the gingival biotype. Both the cases yielded a positive result giving almost complete root coverage. It has been evidenced by several studies that sub epithelial connective tissue grafts have a more predictable outcome in the treatment of gingival recession defects with a substantial amount of root coverage. However, the use of autografts require an additional second surgical site which can cause an increase in patient discomfort and pain post-surgery. Acellular dermal matrix can be used as asubstitute for an autograft.The Novomatrix consists of elastin, proteoglycans, collagen type VI, fibronectin and hyaluronon. These components are similar to those found in the extracellular matrix. Therefore, it helps in tissue regeneration. The use of an acellular dermal matrix results in reduced postoperative bleeding and

swelling which has been described in a case series.

There is a positive recognition of the dermal matrix by the human body as there are no cells present in the matrix, therefore the body recognizes the matrix as self. The dermal matrix causes revascularization, fibroblast repopulation and reduced inflammatory response which ultimately leads to regeneration. The dermal matrix may acts as a scaffold to allow repopulation of fibroblasts, blood vessels, and epithelium from surrounding tissues, and eventually it gets completely replaced with host tissues.[6]

A clinical study was done by Randall J Harris, where the goal of his study was to evaluate the long-term stability of the results of root coverage obtained with an acellular dermal matrix. After a follow- up of 18 months it was observed that the results of root coverage procedure with the use of a dermal matrix were esthetic, stable and predictable.[7]

Similarly another study was done by Shanmugam et al. where the aim of the study was to evaluate the effectiveness of an Acellular dermal matrix graft for root coverage procedures and to objectively analyze the post-operative esthetics using a Visual Analog Scale (VAS). The study showed that acellular dermal matrix graft may be successfully used to treat gingival recession. The grafted areas underwent melanization from the 6$^{th}$ month onwards and complete blending with the adjacent sites was obtained at 1 year.[8]

A histological evaluation of acellular dermal matrix and connective tissue graft was done by Cummings et al., where they concluded that, both the CT and ADM were well incorporated within the recipient tissues. New fibroblasts, vascular elements, and collagen were present throughout the ADM, while retention of the transplanted elastic fibers was apparent. Although CT and ADM have a slightly different histological appearance, both can successfully be used to cover denuded roots with similar attachments and no adverse healing.[9]

On the contrary a clinical study was done by Wei et al. where they compared the efficacy of ADM with a free gingival autograft in increasing the width of keratinized gingiva. They concluded that the ADM allograft was less effective and less predictable than the autogenous free gingival graft for increasing the width of attached keratinized tissue. On the other hand the esthetic results using the ADM allograft might be better than those using the autogenous FGG.[10]

A case study was done by Momen- Heravi et al., where they concluded that the use of ADM as membrane significantly increased the tissue volume (by 1.3 mm) and converted the thin biotype (0.8 mm) to the thick biotype.[11]

## CONCLUSION

Root coverage procedures can give a positive result with proper diagnosis, case selection and appropriate treatment approach. Acellular dermal matrix with coronally advanced flap can provide predictable outcomes when performed in a properly selected case. This case series demonstrates that an Acellular dermal matrix with coronally advanced flap can be successfully used in the management of recession defects.

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