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Acellular dermal matrix in the treatment of multiple mandibular gingival recessions

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Abstract

This case report describes the successful treatment of multiple gingival recessions in the lower arch of a 29-year-old female patient using an acellular dermal matrix. The surgical procedure involved the use of local anesthesia, intrasulcular incisions, tunneling instruments, and 6-0 Vicryl and nylon sutures. The patient was prescribed antibiotics and analgesics and instructed to rinse with chlorhexidine. Follow-up care was provided, and the sutures were removed after 21 days. The patient achieved excellent coverage of the root surfaces and favorable aesthetic results, with stable periodontal tissues observed after two years. This report highlights the potential benefits of acellular dermal matrices for the treatment of gingival recessions.

Keywords: Gingival recession, tunnel technique, acellular dermal matrix

Introduction

Because it is one of the most common gingival affections nowadays, gingival recessions have become part of the daily dental practice. They are defined as the exposure of the radicular surface due to the apical migrations of the gingival margin with respect to the cement-enamel junction ^[1]. This condition is associated with the periodontal tissue loss such as gum, periodontal ligament, radicular cement, bone, and mucosa ^[2].

Etiology

There are several factors that entails or accelerate the appearance of gingival recession, such as:

- Local factors associated with gingival inflammation and junction epithelium consequent loss. These factors are mainly plaque accumulation and calculus.
- The periodontal disease, which is defined as the oral microbiota dysbiosis in the presence of plaque. This setting causes an exaggerated immune response, which in turn causes periodontal tissue loss.
- Gingival recessions, which are also present when traumatic mechanical factors exist such as aggressive teeth brushing.
- Some iatrogenic factors. Orthodontic movement that leads to dehiscence, especially in the mandibular area.
- Restorative treatments that extend subgingivally. These also lead to the apical migration of the gingival margin.
- Anatomic factors. These include fenestration, dehiscence, and abnormal position of teeth in the arc ^[1].

Phenotype

In the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions, the phenotype was defined as the tridimensional gingival volume, which includes the keratinized mucosa thickness and vestibular cortical. A factor predisposing the gingival recession is the thin phenotype and absence of keratinized gingiva ^[3].

Classification systems

There are different gingival recession classifications, although the two most popular in the scientific evidence are Miller's first described in 1985 and Cairo's in 2011.

Miller's Classification

In 1985 Miller proposed a classification system which was based on the extension of the gingival defect and the interdental loss that includes hard and soft tissues. He categorized the mucogingival defect in 4 types:

- **Class I:** Gingival recession which does not extend to the mucogingival junction (MGJ). There is no loss of interdental tissue, and 100% root coverage can be predicted with the treatment.
- **Class II:** Gingival recession that extends to or beyond the MGJ. There is no interdental loss and with proper treatment 100% root coverage can be anticipated.
- **Class III:** Loss of marginal tissue that extends beyond the MGJ and involves interdental loss of hard or soft tissue or dental malposition, which makes it impossible to obtain 100% root coverage with mucogingival treatment.
- **Class IV:** Gingival recession extending to or beyond the MGJ with interdental loss and/or malposition so severe that root coverage is not ensured ^[4].

Cairo's classification

First described in 2011, he classified the gingival recessions in a system which is based on the clinical insertion level in the vestibular and interproximal surface and is divided in 3 types:

- **Type 1:** Gingival recession without interproximal attachment loss, the cemento-enamel junction (CEJ) is clinically undetected on both the mesial and distal aspects of the tooth.
- **Type 2:** Gingival recession associated with interproximal attachment loss less than or equal to buccal attachment loss.
- **Type 3:** Gingival recession associated with interproximal attachment loss, which is greater than buccal ^[5].

Treatment

The success of the treatment of gingival recessions is based on the correct determination of different parameters such as its etiology, an evaluation of the degree of damaged tissue and the correct selection of the technique to be used ^[6].

We mainly divide the management of this affliction into surgical and non-surgical treatment. The type of treatment to apply will depend on the factors mentioned above, as well as the willingness of the patient to undergo the different types of surgical treatment.

Non-surgical treatment

Since patients do not always agree to undergo surgical treatment, palliative treatment is based on alleviating the symptoms that it causes, such as hypersensitivity. This treatment should be based on the instructions for oral hygiene and care by the patient and the dentist.

Surgical treatment

We can divide this depending on the technique and material to be used. The selection of the technique is influenced by different factors such as the anatomy and size of the defect, width of the keratinized gingiva, thickness of the flap, level of the interdental papilla, alveolar bone, depth of the vestibule, and position of the frenulum.

Among the different techniques that have been described over

time with abundant scientific evidence we find the free gingival graft, rotated double papilla or laterally rotated flap, coronal advancement flap, connective tissue grafts and their modifications, as well as combination with different Biocompatible materials such as enamel matrix-derived proteins, membranes, acellular dermal matrix grafts, platelet-rich plasma, and fibroblast dermal substitutes.

Connective tissue graft

The subepithelial connective tissue graft should be the first choice because it is one of the most predictable and the one with the most aesthetic results. In addition to this, it is also highly versatile since it can be done using different techniques, thus yielding higher success rates.

Among its advantages we have:

- The evident aesthetic improvement due to gum color coincidence.
- The healing of the donor site, along with the site of the surgery, occur on first intention.
- This same healing facilitates postoperative morbidity ^[7].

Acellular dermal matrix

The acellular dermal matrix is an allograft obtained from human skin. It is chemically processed to remove all epidermal and dermal cells while preserving the extracellular dermal matrix. In 1994 its use, Alloderm, was introduced in periodontal plastic surgeries. Among its advantages we have the fact that it does not have a donor site, lower morbidity and risk of postoperative complications (Tavelli 2019), and similarity with the color of the tissue of the adjacent area with a favorable aesthetic result ^[8].

Clinical Case

A 29-year-old female patient attended the consultation claiming to "have a lot of sensitivity in her teeth". In her medical history, she denies having allergies, systemic diseases, addiction to alcohol and addiction to tobacco.

On clinical examination, multiple Cairo type 1 gingival recessions are noted in the lower arch, treatment options are given, and the patient opts for an acellular dermal matrix to avoid a donor site and thus reduce postoperative morbidity. (Figure 1) Local anesthesia is placed in the lower arch, anesthetizing the buccal and mental nerves and their incisor endings with 2 cartridges of 2% lidocaine with 1:100,000 epinephrine.

Intrasulcular incisions were made on the vestibular surfaces of the dental organ 36 to 46 with a 15c scalpel blade and with the help of tunneling instruments it was elevated, forming a tunnel from molar to molar and carefully taking care of the papillae. (Figure 2) Afterwards, the acellular dermal matrix from the Alloderm brand was adjusted to cover from molar to molar. It was positioned inside the mucogingival tunnel using 6-0 Vicryl sutures, and then fixed to the ends with the same type of suture. The entire lower arch is sutured using 6-0 nylon sutures with a suspensory technique. (Figure 3) (Figure 4)

The patient was prescribed amoxicillin with clavulanic acid 875 mg every 12 hours for 5 days, as well as Ibuprofen 400mg one tablet every 8 hours. She was instructed to rinse twice a day with 0.12% chlorhexidine for two weeks and was followed up for care and cleaning every third day. The sutures were removed 21 days after surgery, resulting in excellent coverage of the root surfaces and favorable aesthetic results.

The patient continued with a maintenance of dental cleanings every 6 months. And after 2 years, stable periodontal tissues were observed. (Figure 5)

Annexes



Fig 1: First clinical checkup. Cairo type 1 gingival recessions



Fig 2: Tunnel technique preparation



Fig 3: Acellular dermal matrix (Alloderm) fixed



Fig 4: Acellular dermal matrix positioned in the right place to cover all gingival recessions



Fig 5: Comparison between the initial check-up and the two-year follow-up

Conclusion

The use of Acellular Dermal Matrix can lead to favorable and aesthetic results, with complete root coverage achievable when the appropriate surgical technique is chosen based on a correct evaluation of each patient's case.

Discussion

While connective tissue grafting is considered the Gold Standard for the treatment of gingival recessions, Acellular Dermal Matrix has emerged as a viable alternative due to its advantages in terms of availability, ease of use, and reduced morbidity. This case report demonstrates the successful use of Alloderm in achieving stable and aesthetically pleasing results over the long-term. Although further studies are needed to fully evaluate the efficacy of this technique, the results of this case suggest that Acellular Dermal Matrix can provide a reliable and effective option for treating gingival recessions.

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