Microsurgical Approach To Subepithelial Connective Tissue Graft For Treatment of Gingival Recession

Ashvini Padhye[1], Rashmi Hegde[2], Sumanth S.[3], Sanjeev Patil[4]

Abstract

Gingival recession is one of the most common mucogingival deformity and treatment should be rendered in a manner such that the best esthetic results are achieved. Periodontal plastic surgery is a rapidly emerging field, which helps us to meet this criterion. Various techniques have been employed in the past years using conventional surgical procedures to achieve coverage of denuded roots. Increased patient awareness has generated the demand for an ideal therapy encompassing the elimination of disease and the restoration of esthetics and function that is administered with minimal trauma and discomfort. . This case report throws light on the use of a surgical operating microscope to cover Miller's class I gingival recession in a maxillary left canine using the subepithelial connective tissue graft technique and its advantages over the conventional technique under normal or macro vision. Satisfactory root coverage was obtained with excellent esthetics and patient comfort.

Key Words : Microsurgery, Periodontal plastic surgery, Root coverage, Gingival recession, Denuded roots

Introduction

Contemporary periodontal therapy extends well beyond merely treating the bacterial component of periodontal disease. Gingival recession is one of the most common mucogingival deformity and should be treated in a way such that the best esthetic results are achieved. Various techniques have been employed in the past years using conventional surgical procedures to achieve coverage of denuded roots. Increased patient awareness has generated the demand for an ideal therapy encompassing the elimination of disease and the restoration of esthetics and function that is administered with minimal trauma and discomfort. These expectations can be met by the periodontist who extends expertise beyond conventional technology and employs the use of minimally invasive procedures using various magnification systems[1]. This case report throws light on the subepithelial connective tissue graft technique for covering gingival recession performed under a surgical operating microscope and its advantages over the conventional technique under normal vision.

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Microsurgery

Microsurgery can be defined as the refinement in surgical technique by which normal vision is enhanced through magnification.[2,3] Surgical operating microscopes are widely used in the field of microvascular surgery and other medical fields, but in dentistry they have been largely limited to use in endodontics[1]. However, the popularity of periodontal plastic surgery has enhanced the use of microsurgery in periodontics because of an increased visibility of the surgical site and the creation of smaller surgical wounds, resulting in an expedited healing process with minimal post-surgical discomfort

Microsurgical Instruments[2,3,4,5,6,7]

Microsurgical instruments are specifically designed to minimize trauma. They are circular in cross-section to permit rotational movement by the clinician and are used to make a clean, nonragged incision to prepare the wound for healing by primary intention. Incisions can be established at a 90° angle to the surface using ophthalmic microsurgical scalpels. Since microsurgical instruments are made of titanium, they are strong, lightweight, and

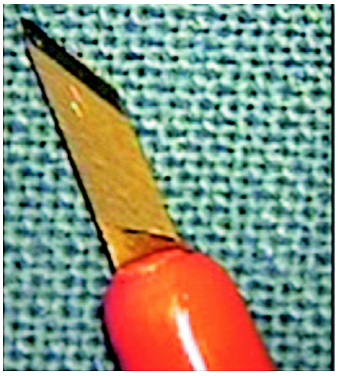

Fig. 1. Ophthalmic blade 16x magnification.

nonmagnetic. A variety of shapes and sizes of microsurgical scalpels and ophthalmic scalpels can be used for periodontal procedures (Fig. 1).

Titanium micro-instruments such as tissue forceps, micro-scissors, breakable carbon steel blade, scalpel handle, needle holder, micromirrors (furcation and interdental), microelevators, microretractors, and root resection instruments are also available.

Sutures for Microsurgery[4,7]

Sizes 6-0 to 10-0 absorbable sutures are used to approximate wound edges accurately. For periodontal microsurgery, usually the 3/8" reverse-cutting needles ensure optimum results. The length of needle can vary from 5 mm to 13 mm depending on its area of application. Along with material properties, the color of the suture material is important in micro-surgery since noncolored material is invisible even under magnification. Very dark-tinted suture thread is the most visible (Fig. 2).

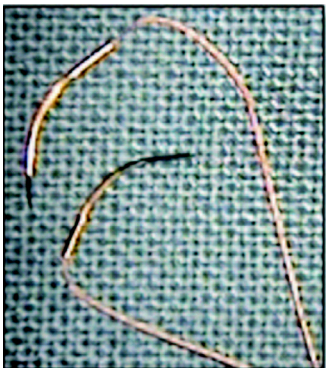

Fig. 2. 6-0 and 8-0 sutures at 16x magnification

Case Report

A 30 year old male patient reported to the department of Periodontics & Oral Implantology with a complaint of sensitivity in relation to the maxillary left canine (23) . On examination an isolated Miller's Class I recession defect was present on the buccal aspect of 23 (Fig. 3). There was adequate attached gingival apical to the defect. After through scaling and root planning, a subepithelial connective tissue graft surgery was planned under the surgical microscope for root coverage.

Fig. 3. Miller's Class I recession maxillary left canine (23)

Surgical Technique (Fig. 5 - 13)

A Moller Wedell microscope (Fig. 4) was used for the entire procedure with a magnification range of 10x-16x. The entire surgical procedure was performed under the the microscopic vision. A vertical incision was made using an ophthalmic blade (Fig. 5) on the mesiobuccal aspect of the maxillary left first premolar (24). The tip of the interdental papilla between 23 & 24 was left intact and the incision was extended horizontally in a mesial direction 2mm apical to the tip taking care not to damage the tip of the papilla . The incision was then extended along the buccal aspect of 23 upto the mesial papilla. A partial thickness flap was dissected to create a pouch to receive the subepithelial connective tissue graft at the recipient site. A subepithelial connective tissue graft was harvested from the hard palate using an ophthalmic blade and the trap-door technique. The harvested tissue was handled with utmost care and tucked into the pouch prepared at the recipient site. The graft was secured in place using 6-0 mono-filament polypropylene absorbable sutures to prevent any mobility during

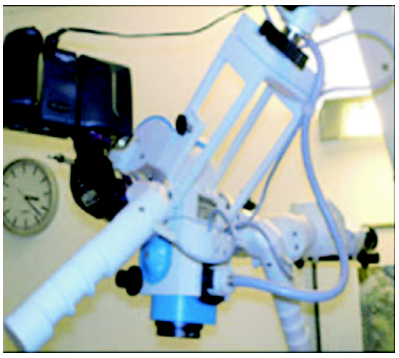

Fig. 4. Moller Wedel microscope.

Fig. 5. Single vertical incision with Ophthalmic blade at 10x magnification.

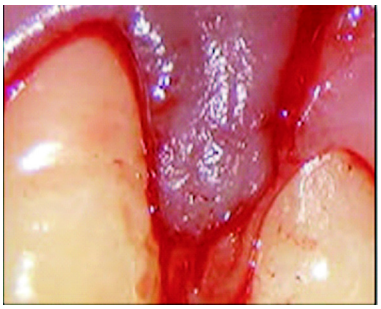

Fig. 6. Horizontal incision to preserve the papilla (10x magnification).

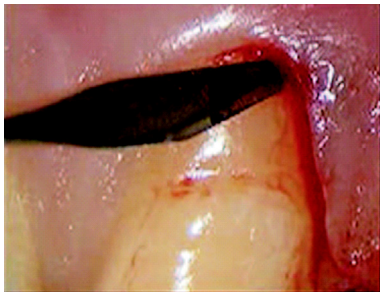

Fig. 7. Pouch preparation with ophthalmic blade (10x magnification)

Fig. 8. Partial thickness flap reflected.

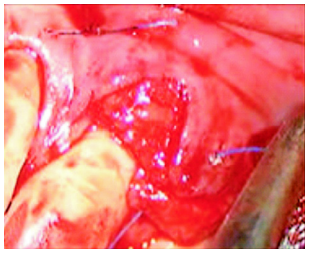

Fig. 11. Graft in place (10x magnification).

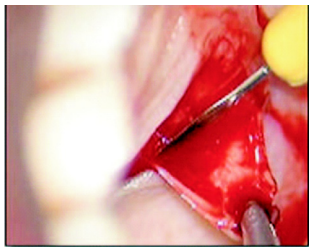

Fig. 9. Trap door prepared on palate to harvest connective tissue, with ophthalmic blade (10x magnification).

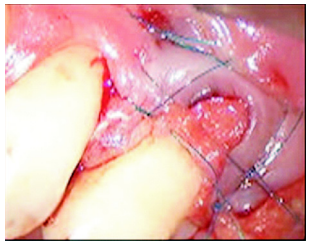

Fig. 12. Graft sutured with 6-0 monofilament polypropylene absorbable sutures showing complete intra-operative coverage.

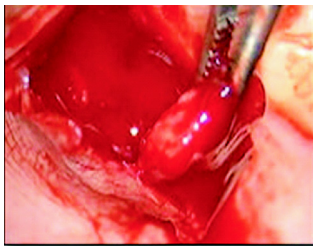

Fig. 10. Connective tissue graft being harvested from palate (10x magnification).

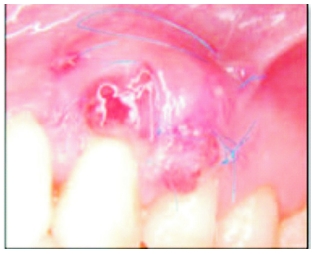

Fig. 13. One-week post-operative view of the graft, showing accelerated healing of the graft.

healing. The elevated flap was then sutured back over the entire graft except the part of the graft covering the exposed root surface. Pressure sutures were placed over entire recipient site. The epithelial flap was sutured back at the donor site. Complete intraoperative closure was achieved with minimal trauma at both the recipient and donor sites and an exceptionally pleasing esthetic outcome[8] . A tin foil was adapted over the recipient site and a non eugenol periodontal dressing was placed over it to protect the graft. Healing of the graft and the donor sites was observed at intervals of one week, two weeks, one month, three months, and six months.(Figs. 14 and 15).

Fig. 14. One-month post-operative view of the graft showing faster healing but some shrinkage.

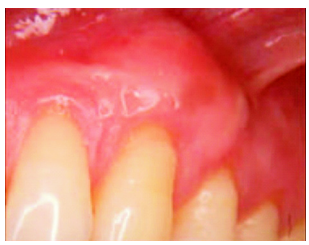

Fig. 15. Six-months post-operative view of the graft, showing 80% root coverage.

Discussion

Development in human research and technology has enabled the dental profession to offer better therapy to patients. Periodontics is a rapidly evolving field of dentistry with major changes occurring during the last five decades. The transition from use of a radical gingivectomy for the elimination of periodontal pockets to the use of flap surgeries and different regenerative measures is indicative of such change. The introduction of microsurgery is a part of this process and has helped the periodontist in treating the patient in a conservative manner using enhanced visibility of the surgical field and minimizing surgical wounds to achieve a favorable treatment outcome. Thus, the superior endpoint of esthetic appearance following microsurgery compared to conventional surgery is because of the remarkable advantages magnification offers to microsurgery. Burkhardt R and Lang NP, in their study, showed that root surface coverage with a subepithelial connective tissue graft using a microsurgical approach substantially improved the vascularization of the grafts, seen with fluorescent angiograms, and resulted in increased percentage of root coverage compared with applying a conventional macroscopic approach[9].

There are some limitations in the use of microsurgery in periodontics. The clinician operating the microscope needs to be trained. Presently, there are very few institutions offering such training for surgeons in the use of a microscope, which could lead to its indiscriminate use. It is prudent to remember that nonsurgical as well as conservative surgical therapy still forms the basis of a quality periodontal practice. The very nature of periodontal surgery demands a surgical microscope capable of offering a broader area of focus compared to needs in endodontics. A periodontal surgeon needs to change the focus of the microscope continuously while performing microsurgery, which can be a cumbersome process with the current generation of microscopes. However, advancing technology will likely overcome the disadvantages seen with the present generation of microscopes. This will no doubt benefit the clinicians in their endeavor to provide excellent treatment options for their patients.

Conclusion

In the present case report, a subepithelial connective tissue graft was used under microscopic vision for coverage of denuded root. Even though the procedure shown in this report can be performed using normal vision, performing this procedure using a surgical microscope and microsurgical instruments offers definite advantages in terms of improved visual acuity, superior approximation of wounds, rapid

wound healing, decreased post-operative morbidity, and increased acceptance by the patients. Despite the advantages stated previously, as well as those cited by various other authors[5,6,7,9], there is still a lack of "high level of evidence" in the form of controlled clinical trials to estimate the magnitude of the real benefits of the microsurgical approach over the conventional approach.

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