

# Modified Coronally Advanced Tunnel (MCAT) Technique with Subepithelial Connective Tissue Graft (SCTG): A Case Report

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## ABSTRACT

Among different surgical procedures, the Modified Coronally Advanced Tunnel (MCAT) technique has been studied to increase gingival dimensions and effectively achieve coverage of the denuded root surface area and enduring stability. The regular usage of Subepithelial connective tissue graft along with MCAT, has been suggested by many authors, which is considered as a standard means of building up the soft tissue to achieve the best coverage as possible of recessions and increasing the phenotypical width. Also, the muscular pull caused by insufficient vestibular depth can sometimes be a culprit behind the onset of gingival recession, which can be corrected by vestibuloplasty. Thus, in this case report, multiple gingival recessions were treated by Modified Coronally Advanced Tunnel (MCAT) technique with Sub-epithelial Connective Tissue Graft (SCTG).

**Keywords:** Tissue graft, Root coverage, Vestibuloplasty.

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**Received:** 23-06-2023;

**Revised:** 18-07-2023;

**Accepted:** 13-08-2023.

## INTRODUCTION

Gingival recession is defined as the displacement of the gingival margin apical relative to the Cemento-Enamel Junction (CEJ).<sup>1</sup> The denuded root surfaces are usually linked to aesthetic issues, root sensitivity, and challenges achieving ideal plaque control. Gingival recession has been linked to several risk factors, including abnormal brushing of the teeth, gingival phenotype which is thin, orthodontic procedures and cervical endodontic restorations.<sup>2</sup> The treatment of multiple adjacent gingival recessions becomes more challenging as the soft tissues management becomes difficult along with hampering of the wound healing process by various factors such as the avascular surface's breadth, insufficient supply of blood, the arrangement of the teeth and the variations in recession depth. The Modified Coronally Advanced Tunnel (MCAT) technique has some benefits like (a) improving vascularization of the surgical area by avoiding papillary incisions and not giving vertical releasing incisions, and (b) the chances of graft survival are increased by the coronal displacement of the flap which eventually completely covers the soft tissue graft. These reasons have led to the proposition of MCAT for the surgical treatment of such cases.<sup>3</sup> Recent studies show that for

root coverage treatment, the subepithelial connective tissue graft harvested and placed beneath the MCAT is a reliable method. The dual supply of blood at the recipient bed from the overhead recipient flap and the underlying connective tissue has led to the success of these grafts.<sup>4</sup> Additionally, inadequate vestibular depth can be a predisposing factor for gingival recession which can be treated by vestibuloplasty. Thus, this case report describes a surgical case in two stages, where in first stage, vestibuloplasty was planned to increase the vestibular depth followed by second stage surgery of MCAT along with SCTG.<sup>5-7</sup>

## CASE REPORT

A 27-year-old male patient visited the Department of Periodontology, Bharati Vidyapeeth (Deemed to be University), Dental College and Hospital, Pune with the chief complaint of receding gums in lower anterior region of the mouth. The patient also complained of poor routine oral hygiene maintenance due to insufficient vestibular depth, which restricts easy toothbrush movement. On routine examination, it was revealed that the patient had no relevant dental and medical history previously and no tissue abusing habits. The patient had an inadequate vestibular depth (2 mm) and the tension test resulted to be positive in relation to the lower anterior region. Gingival recession (Miller's Class I)<sup>8</sup> was present in relation to 31 and 41. The patient was suggested to be treated for the shallow vestibule with LASER-assisted vestibuloplasty in the first stage.



DOI: 10.5530/jyp.2023.15.106

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### Stage I Surgery

Pre-operative image is shown in (Figure 1 A). NovoLase Gold soft tissue diode laser was used to perform the vestibuloplasty procedure with the power setting of 810nm, 2.0 W. A depth of 8 mm was achieved (Figure 1 B). Stay sutures were placed (4-0 Vicryl Sutures) (Figure 1 C). The raw wound surface was completely covered with a Periodontal Dressing (PerioPak). (Figure 1 D). The re-evaluation of the patient was done after one week of recall. The healing wound region was seen to be occupied by a protein coagulum after a week followed by absolute epithelialization within 2 weeks. Regular follow-up visits were given to the patient after 7, 15 and 30 days after surgery. After 30 days of treatment, remarkable recovery of the tissue was seen, as well as the vestibular depth expanded to 6 mm. (Figure 1 E). Without any discomfort or indications of infection, the postoperative healing process progressed effectively.

### Stage II surgery

The second stage was planned after three months of the first stage surgery. (Figure 2 A) shows the pre-operative gingival recession (Millers Class I). Under infiltration of local anaesthesia, careful root planing by hand instruments (Gracey Curettes, Hu-Friedy) was performed on the exposed root surfaces. The crevicular incisions made around the affected teeth using microsurgical Tunneling Knives (TKN 1, Hu-friedy), marked the initiation of the MCAT. (Figure 2 B) Mucoperiosteal envelope flaps were first elevated which were further interconnected in a tunnel preparation in due course. A partial thickness flap was prepared such that it extended out with the mucogingival junction and lastly, tension-free, passive coronal movement of the flap was achieved by careful undermining of interdental papillae. The next step was to achieve a connective tissue graft, which was procured by de-epithelialization of a free gingival graft that was harvested from the palate (Figure 2 C). A hemostatic agent (AbGel) was placed at the donor site along with palatal acrylic plate. The region with the widest recession was the insertion point for the harvested graft inside the subperiosteal tunnel and stabilized by using sling sutures around the involved teeth (Figure 2 D). The final position of the tunnelled flap was secured by sling sutures,



Figure 2: Stage II surgery.



Figure 3: Post-operative healing of the recipient.

1 mm coronal to the Cemento-Enamel Junction (CEJ), using the teeth as anchors. (Figure 2 E).

The patient was prescribed analgesics for 3 days (Diclomol) and prophylactic antibiotics (625 mg Augmentin) for 7 days. Along with the medications, the patient was prescribed 0.2% chlorhexidine mouth rinse (2×per day for 3 weeks) and to refrain from tooth brushing at the surgical sites for 2 weeks. Recall appointments were scheduled after 7 days, 15 days and 30 days post-surgery. (Figure 2 F and G) shows the post-operative healing of the recipient and donor site respectively. (Figure 3) shows positive recession coverage result with 31 and 41.

### DISCUSSION

It is challenging for the clinician to provide predictable coverage of numerous adjacent gingival recessions. Until now, evidences have shown that various combinations of soft tissue grafts along with the Modified coronally advanced tunnel technique have been a successful treatment option. Among the usage of other soft tissue grafts, the sub-epithelial connective tissue graft has been voted to yield the most preferable outcome.<sup>9</sup>



Figure 1: Pre-operative image.

A connective tissue graft is considered to be the gold standard for its major of two advantages: (i) Improved vascularization leading to better early healing and fine adaptation of soft tissues on the planed root surface and (ii) Increased tissue thickness that leads to better resistance to relapse which in turn gives greater stability over time.<sup>10</sup>

Achieving the increase in thickness of the keratinized attached gingiva along with obtaining a sufficient vestibular depth for routine oral hygiene maintenance was the chief objective of this case. A shallow vestibule can be deepened by the widely performed vestibuloplasty technique. Clark's technique (1953) recommends the elevation of the pedicled flap off the lip and the open wound area is left to heal by secondary intention on the alveolar side rather than the lip side.<sup>11</sup> This case yielded positive root coverage after one month. In this study, no crucial disadvantageous events were observed after the surgical protocol. The patient preference for this periodontal mucosal surgical treatment has escalated, owing to its high subjective satisfaction and low morbidity.<sup>12</sup>

## CONCLUSION

The result obtained in the present case report must be considered in the context of the precise skills of the surgeon, the implication of a very rigorous pre- and post-surgical protocol, and the application of a microsurgical approach. In conclusion, this study justifies that Modified coronally advanced tunnel technique with the additional use of subepithelial connective tissue graft can result in favourable clinical outcomes and patient satisfaction in the treatment of single and multiple gingival recessions.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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**Cite this article:** Gaikwad I, Lele P, Dodwad V, Mariam S. Modified Coronally Advanced Tunnel (MCAT) Technique with Sub-epithelial Connective Tissue Graft (SCTG): A Case Report. *J Young Pharm.* 2023;15(4):764-6.