IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 25, Issue 7 Ser. 1 (July. 2026), PP 43-49
www.iosrjournals.org

Selection Of Periodontal Flap Designs For Pocket Reduction: A Case Series Of Three Surgical Techniques

Dr. Shipra Singh, Dr. Sanjay Gupta, Dr. Neelu Verma, Dr. Aiman Raziq, Dr. Farheen Afsar Khan

(Post Graduate Trainee, Department Of Periodontology And Implantology, Career Post Graduate Institute Of Dental Sciences, Lucknow, U.P)
(Professor & Head, Department Of Periodontology And Implantology, Career Post Graduate Institute Of Dental Sciences, Lucknow, U.P)
(Professor, Department Of Periodontology And Implantology, Career Post Graduate Institute Of Dental Sciences, Lucknow, U.P)
(Post Graduate Trainee, Department Of Periodontology And Implantology, Career Post Graduate Institute Of Dental Sciences, Lucknow, U.P)
(Post Graduate Trainee, Department Of Periodontology And Implantology, Career Post Graduate Institute Of Dental Sciences, Lucknow, U.P)

Abstract
Periodontitis is a chronic inflammatory disease that leads to the destruction of the periodontal attachment apparatus and possible tooth loss. The ultimate goal of periodontal therapy is to prevent further disease progression in order to reduce the risk of tooth loss. This objective can be achieved through a number of therapeutic modalities comprising both the nonsurgical and surgical phases of periodontal therapy. The Flap surgery procedures permit the surgical debridement of root surfaces and removal of soft tissue following the reflection of a mucoperiosteal flap. Different Flap Techniques are used such as The Modified Widman Flap (MWF) The papilla preservation flap and The Modified flap operation. The Modified Widman Flap (MWF) is a conservative periodontal surgical procedure designed to provide access for thorough root debridement while minimizing trauma to the periodontal tissues. The papilla preservation flap technique provides adequate surgical access for debridement while maintaining interdental soft tissue integrity and minimizing postoperative recession. And the "Modified flap operation" involves incisions made intracrevicularly through the bottom of the pocket and scaling and curettage after the elevation of flap. This case series demonstrates the effectiveness of the three different flap designes in achieving periodontal pocket reduction and improving periodontal health.
Keywords: *Modified Widman Flap, Papilla preservation flap, Modified flap operation, Flap surgery, periodontal therapy.*

Date of Submission: 26-06-2026 Date of Acceptance: 06-07-2026

I. Introduction

Periodontitis is a chronic inflammatory disease characterized by destruction of the supporting structures of the teeth, resulting in periodontal pocket formation and attachment loss. Although non-surgical periodontal therapy remains the first line of treatment, residual periodontal pockets may persist and require surgical intervention.[1]

The early descriptions of periodontal flap surgery were by Widman in 1918[2] and Neumann in 1920.[3] This surgical technique was aimed at pocket elimination. Kirkland in 1931[2] described the first periodontal surgical procedure that was aimed at regeneration and reattachment to the root surface. Most of the conventional periodontal surgical procedures are modifications of these early techniques.

The Modified Widman Flap, introduced by Ramfjord and Nissle, is one of the most widely performed periodontal flap procedures. The primary objective of the technique is to provide access for meticulous root surface debridement while preserving as much soft tissue as possible.[2] Unlike pocket elimination procedures, the Modified Widman Flap aims to achieve healing through improved adaptation of the soft tissues to the root surface following thorough debridement.[4]

Genon and Bender (1984) introduced a technique for esthetic purposes, later detailed by Takei et al. (1985) as the Papilla Preservation Flap (PPF).[5] This approach, inspired by Genon's work, aimed at optimal interproximal coverage and facilitated bone graft placement, preventing graft material exfoliation.[6]

The Modified flap operation was described by Kirkland in 1931. It is an access flap for the debridement of the root surfaces. The main advantages of this procedure are the preservation of maximum healthy tissue and minimum post-operative discomfort to the patient.[7]

This case series describes the use of three different flap techniques for the treatment of periodontal pocket.

II. Case Report 1

Patient Information

A 21-year-old female patient, Ms. Anamika, reported to the Department of Periodontology with a chief complaint of food lodgement and pain in the upper right and left back tooth region of the jaw.

The patient's medical history was non-contributory, and no systemic conditions affecting periodontal health were reported. The patient was not under any long-term medication and had no history of allergies.

Clinical Examination

Intraoral examination revealed generalised chronic periodontits in the maxillary right and left posterior region (Fig-1). Periodontal probing demonstrated probing pocket depths of 6-8 mm in relation to teeth 14,15, 16 and 17 (Fig- 2) and 6-7 mm in relation to24, 25,26 and 27 (fig- 11). Food impaction was evident in the interdental area between the affected teeth, accompanied by gingival inflammation and bleeding on probing. Pain was dull in nature.Based on the clinical findings, a diagnosis of localized chronic periodontitis involving teeth 14,15,16&17 and 25, 26 &27 was established. Following completion of Phase I therapy the probing depth,gain in clinical attachment level were reevaluated and then surgical periodontal therapy using a Modified Widman Flap in the 1st quadrant and Modified Flap Operation in the 2nd quadrant was planned.

Surgical Procedure

Site 1

After obtaining written informed consent, the surgical site was anesthetized using local anesthesia. The operative area was disinfected and isolated appropriately.

A Modified Widman Flap was planned involving teeth 14, 15, 16, and 17 to provide adequate access..

The procedure was performed using the classical three-incision technique. The first incision, an internal bevel incision, was placed with a #15 blade, approximately 0.5–1 mm from the gingival margin and directed toward the alveolar crest (Fig- 3). This was followed by a crevicular incision extending around teeth 14, 15, 16, and 17 (Fig- 4). A third interdental incision was then made to separate the collar of inflamed soft tissue from the underlying root surfaces (Fig- 5).

A full-thickness mucoperiosteal flap was carefully reflected to expose the root surfaces and underlying periodontal tissues (Fig- 6). Granulation tissue present within the periodontal pockets was meticulously removed using Gracey curettes. Thorough scaling and root planing were subsequently performed under direct vision to eliminate plaque, calculus, and contaminated cementum from the root surface. (Fig- 7).

The surgical site was irrigated thoroughly with sterile saline solution to remove residual debris and inflammatory tissue. Following debridement, the flap was repositioned at its original level and adapted closely to the tooth surfaces. Interrupted sutures were placed to secure the flap and promote primary healing (Fig- 8). A periodontal dressing (Coe-Pak) was then applied to protect the surgical site during the postoperative healing period (Fig- 9).

Fig- 1,2

FIG 3,4

FIG 5,6

FIG 7

FIG 8,9

Postoperative Care and Follow-Up

The patient received postoperative instructions regarding oral hygiene maintenance and dietary precautions. Analgesics and antimicrobial mouth rinses were prescribed as required.

The patient was recalled after one week for removal of the periodontal dressing and sutures. Healing was uneventful, with no evidence of postoperative complications. Follow-up examinations demonstrated satisfactory tissue adaptation, reduction in inflammation, and improvement in periodontal health (Fig-10). The patient also reported relief from food lodgement in the treated area.

Figure 10

Site 2

After obtaining written informed consent, the surgical site was anesthetized using local anesthesia. The operative area was disinfected and isolated appropriately.

A Modified Flap Operation was planned involving teeth 25, 26, and 27 to provide adequate access to the periodontal pockets .The procedure was performed with the first incision, intrasulcular incision was placed with a #15 blade extending around 24, 25, 26, and 27 both the buccal and the palatal aspects continuing it

interdentally extending it in the mesial and distal direction (Fig- 12). The buccal and the lingual/palatal flaps are then elevated to expose the diseased root surfaces and the marginal bone (Fig- 13).

The area is then debrided for all the granulation tissue present and scaling and root planing of the root. Granulation tissue present within the periodontal pockets was meticulously removed using Gracey curettes (Fig- 14). Thorough scaling and root planing were subsequently performed under direct vision to eliminate plaque, calculus, and contaminated cementum from the root surface.

The surgical site was irrigated thoroughly with sterile saline solution to remove residual debris and inflammatory tissue. Following debridement, the flap was repositioned at its original level and adapted closely to the tooth surfaces. Interrupted sutures were placed to secure the flap and promote primary healing (Fig- 15). A periodontal dressing (Coe-Pak) was then applied to protect the surgical site during the postoperative healing period (Fig- 16)

FIG 11,12

FIG 13,14

FIG 15,16

Postoperative Care and Follow-Up

The patient received postoperative instructions regarding oral hygiene maintenance and dietary precautions. Analgesics and antimicrobial mouth rinses were prescribed as required.

The patient was recalled after one week for removal of the periodontal dressing and sutures. Healing was uneventful, with no evidence of postoperative complications. Follow-up examinations demonstrated satisfactory tissue adaptation, reduction in inflammation, and improvement in periodontal health. The patient also reported relief from food lodgement in the treated area.(figure 17)

Figure:17

III. Case Report 2

Patient Information

A 30-year-old male patient, Mr. Waseem Ahmed, reported to the out patient department of Periodontology with a chief complaint of pus discharge from the upper front tooth region. The patient's medical history was non-contributory, and no systemic diseases or medications affecting periodontal health were reported.

Clinical Examination

Intraoral examination revealed localized periodontal inflammation in relation to tooth 11,12& 21,22 (Fig-18). Periodontal probing demonstrated a probing pocket depth of 6-9 mm on the affected teeth (Fig- 19). Gingival inflammation and suppuration were evident clinically. Considering the depth of the pocket and the esthetic importance of the anterior region as midline diastema is also present; surgical periodontal therapy using a papilla preservation flap was planned.

Surgical Procedure

Following completion of Phase I periodontal therapy and reevaluation, surgical intervention was undertaken under local anesthesia. The operative field was prepared using standard aseptic procedures.

A papilla preservation flap was designed, involving teeth 12, 11, 21, and 22, to provide access to the defect while preserving the interdental soft tissue. On the facial aspect, sulcular incisions were placed around the involved teeth (Fig-20). The palatal flap design consisted of sulcular incisions along the palatal aspect of the maxillary anterior teeth, The semilunar incision was designed to dip apically from the line angles of the adjacent teeth so that the papillary incision line remained at least 5 mm from the gingival margin. This design facilitated careful dissection of the interdental tissue from the palatal aspect, allowing the papilla to be elevated intact with the facial flap while preserving its vascularity and architecture.[2]

A full-thickness mucoperiosteal flap was carefully reflected to expose the underlying root surfaces and periodontal defect (Fig- 21). To eliminate the pocket epithelium and inflamed granulation tissue, the undersurface of the reflected flap was meticulously curetted and trimmed. The preserved thickness of the interdental tissue contributed to maintenance of an adequate blood supply and minimized the possibility of postoperative gingival recession.[3]

The defect was thoroughly debrided using Gracey curettes. Scaling and root planing were performed meticulously to remove plaque, calculus, and contaminated cementum from the root surfaces (Fig-22). The surgical site was irrigated with sterile saline to eliminate residual debris and blood clots.

Following completion of debridement, the flap was repositioned to its original position and adapted closely to the tooth surfaces. Interrupted sutures were placed to achieve stable primary closure (Fig-23 & Fig-24). A periodontal dressing (Coe-Pak) was subsequently applied to protect the surgical area during the healing phase (Fig- 25).

FIG 18,19

FIG 20,21

FIG 22,23

FIG 24,25

Postoperative Care and Follow-Up

The patient was provided with postoperative instructions regarding oral hygiene maintenance and dietary precautions. Analgesics and antimicrobial mouth rinses were prescribed as required. The patient was recalled after one week for evaluation and removal of the periodontal dressing and sutures.

Healing was satisfactory with no signs of infection or adverse tissue reactions. Subsequent follow-up visits demonstrated reduction in gingival inflammation and maintenance of the interdental papilla. The surgical site exhibited favorable soft tissue healing and improvement in periodontal health.(figure-26)

Figure 26

IV. Discussion

Residual periodontal pockets following nonsurgical periodontal therapy often require surgical intervention to facilitate adequate access for root surface debridement and achieve long-term periodontal stability. The choice of flap design depends on the location of the defect, pocket morphology, and esthetic considerations. The present case series demonstrates the successful use of three different periodontal flap

techniques—Modified Widman Flap, Modified Flap Operation, and Papilla Preservation Flap—for the management of periodontal pockets in different clinical situations.

The Modified Widman Flap remains one of the most predictable periodontal surgical procedures for managing residual periodontal pockets. The technique provides excellent access for root debridement while preserving the gingival tissues and minimizing postoperative recession.[4]

The modified flap operation, in contrast to the original Widman flap and the Neumann flap, did not include removal of non-inflamed tissues and apical displace ment of the gingival margin, thus causing a minimal amount of trauma to the remaining periodontal tissues and a minimum of discomfort to the patient.[8]

In esthetically sensitive areas, preservation of the interdental papilla is essential to prevent gingival recession and loss of papillary architecture. Conventional flap procedures may result in soft tissue shrinkage and interdental papillary loss, leading to unaesthetic black triangles and gingival recession.[1]

The papilla preservation flap technique was developed specifically to address these concerns by preserving the entire interdental papilla during flap reflection.[2] The technique provides excellent access for root debridement while maintaining tissue integrity and vascular supply. Cortellini and coworkers further demonstrated that preservation of the papilla improves wound stability and promotes favorable healing outcomes.[9]

Overall, the findings emphasize that flap selection should be individualized according to the clinical presentation and treatment objectives. Appropriate surgical access combined with meticulous root debridement can effectively reduce periodontal pockets and achieve favorable clinical outcomes while preserving periodontal soft tissues.

V. Conclusion

The present case series demonstrates that periodontal flap surgery is an effective treatment approach for the management of residual periodontal pockets that persist following nonsurgical periodontal therapy. The Modified Widman Flap, Modified Flap Operation, and Papilla Preservation Flap each provided adequate access for thorough root debridement and removal of inflammatory tissue, resulting in favorable healing and improvement in periodontal health.

Successful outcomes were achieved through appropriate case selection and flap design based on the clinical and esthetic requirements of each patient. All three techniques resulted in reduction of periodontal inflammation, satisfactory soft tissue healing, and resolution of patient complaints, highlighting the importance of individualized surgical planning in achieving predictable periodontal treatment outcomes and long-term periodontal stability.

References

[1]. Newman MG, Takei HH, Klokkevold PR, Carranza FA. Carranza's Clinical Periodontology. 14th Ed. Elsevier; 2023.
[2]. Everett FG, Waerhaug J, Widman A. Leonard Widman: Surgical Treatment Of Pyorrhea Alveolaris. J Periodontol 1971;42:571-9.
[3]. Neumann R. Die Alveolarpyorrhoe Und Ihre Behandlung. 3rd Ed. Berlin, Germany: Hermann Meusser; 1920.
[4]. Ramfjord SP, Nissle RR. The Modified Widman Flap. J Periodontol. 1974;45:601–607.
[5]. Takei HH Et Al. J Periodontol. 1985 56:204
[6]. Sudhakar U Et Al. IJADS. 2020 6:161.
[7]. Kirkland O. Modified Flap Operation In Surgical Treatment Of Periodontoclasia. The Journal Of The American Dental Association (1922). 1932 Nov 1;19(11):1918-21.
[8]. Lindhe J, Lang NP. Clinical Periodontology And Implant Dentistry. 7th Ed. Wiley Blackwell; 2022.
[9]. Cortellini P, Prato GP, Tonetti MS. The Modified Papilla Preservation Technique. Int J Periodontics Restorative Dent. 1995;15(5):462–473.