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**A Study of Comparative Cementing Environment of Vicryl Suture and Fibrin Sealant in Periodontal Surgery - A Case Report**<sup>1</sup>Pinna Pratum G.P, Department of Periodontology, Faculty of Dental Medicine, Mohammed V University, Rabat, Morocco<sup>2</sup>Castellani P.A, Faculty of Dental Medicine, Mohammed V University, Rabat, Morocco**Correspondence Author:** Pinna Prato G.P, Department of Periodontology, Faculty of Dental Medicine, Mohammed V University, Rabat, Morocco.**How to Cite This Article:** Pinna Pratum G.P, Castellani P.A, “A Study of Comparative Cementing Environment of Vicryl Suture and Fibrin Sealant in Periodontal Surgery - A Case Report”, IJDSDR – November – December - 2023, Vol. – 2, Issue – 6, P. No. 01 – 05.**Open Access Article:** This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Type of Publication:** Case Report**Conflicts of Interest:** Nil**Abstract**

Periodontal surgery facilitates the repair of defects and ultimately aims to preserve teeth by restoring the periodontal apparatus. Satisfactory wound healing and the stability of the periodontal surgical site are two of the challenges related to periodontal surgery. In periodontal surgery, adjunct procedures are used to increase the effectiveness of the surgical protocol.

The selection of cementing environments has been reported to influence the healing and the stability of the surgical site. A comparative evaluation of the cementing environment of Vicryl suture and fibrin sealant is presented.

**Keywords:** Periodontal Surgery, Surgical Protocol, Cementing Environment.**Introduction**

Surgical site closure is the crucial role to triumph any periodontal flap procedure that enhances healing and stability<sup>1</sup>. Sutures are available in various types based on its absorbability, source, structure, coating tissue reaction and handling<sup>2</sup>. Vicryl (POLYGLACTIN 910) is a synthetic sterile absorbable surgical suture that is composed of a copolymer made using 90% glycolide and 10% L-lactide. They are found to be nonantigenic, nonpyrogenic and elicit only a slight soft tissue reaction during absorption. It elicits minimal initial inflammatory reaction on tissues, tensile strength and ease of handling. They will help in providing sufficient tension to hold the flaps against each other to eliminate the chance of dead space and better healing<sup>2</sup>. With precise performance of

technique to suture, achievement of high quality results is possible<sup>3</sup>. A biological tissue adhesive, fibrin sealant, that mimics the stages of coagulation has gained popularity among the practitioners as minimally closing aid. However, their effectiveness in the oral cavity under a moist environment is still questionable<sup>4</sup>. Fibrin sealant has existed for the past eight decades and is still being used in various fields of surgery. They are available commercially with varied applications such as hemostat, adhesive and sealants<sup>5</sup>. Fibrin sealant is a two component system that is essentially composed of purified Human Fibrinogen concentrate and purified Human Thrombin. The objective of this split-mouth case report is to evaluate clinically and histopathologically the effectiveness of vicryl suture against fibrin sealant in a Stage III Grade B periodontitis patient following periodontal flap treatment.

### Materials and Methods

Cementing environments must be compared in order to evaluate the effects of the two cementing environment materials: Vicryl suture and fibrin sealant on the periodontal healing process. An appropriate surgical defect was treated with both materials, allowing for a comparison of the healing process and periodontal stabilization at two previously treated sites. After a single injection of 5 mg of oral midazolam for sedation and an inferior alveolar nerve block with 2% lidocaine and 1:80,000 epinephrine, the healing period and treatment protocol were reviewed. The patient did not experience adverse effects, such as swelling, pain, or bleeding, on either treated site. The surgery and materials used on the defector cementing environment were as follows:

The sites were randomly treated with either 4-0 Vicryl suture cementing environment or fibrin sealant cementing environment. The VITROCEL bone graft was

stabilized with a 4-0 Vicryl suture by applying a mattress suture on two sides of the defect; after the graft was covered with a resorbable membrane (BioGide), the subclinical 8 cm strand of Vicryl suture was cemented. The fibrin sealant cementing environment was performed by spraying 1 ml of fibrin sealant onto the graft after the defect was grafted and covered with the same membrane (BioGide) as used for the Vicryl suture. The clinical parameters were healing index (re-epithelialization) and clinical attachment loss (CAL) according to Tan's guidelines, cactus enough and probing depth (PD), any signs of infection, and colour change of grafting site (exposure or not). The radiographic evaluation was performed by analysing the 2D image of horizontal bone regeneration/defect closure on the initial and 2 month interval after the surgery. The patient satisfaction level of appearance in both two treated sites was also recorded.

### Fibrin Sealant: Material and Preparation

Fibrin sealant is a two component system that is essentially composed of purified Human Fibrinogen concentrate (Component 1) and purified Human Thrombin (Component 2).



Figure 1: Fibrin sealant kit with component 1 and component 2

The duploject syringes with freshly drawn fibrinogen solution and the thrombin solution are loaded onto a double syringe clip system with plunger. [Figure 5]



Figure 2: Constitution of 1 mL Sterile water into Fibrinogen concentrate



Figure 3: Drawing fibrinogen solution from the reconstituted mixture



Figure 4: Drawing 1 mL Calcium chloride to transfer to Thrombin 500 IU



Figure 5: Duploject syringes with Fibrinogen solution and Thrombin solution with double syringe clip and plunger

### Surgical Technique

The administration of local anaesthesia, sulcular incision extended from the first premolar through the second terminating at the distal aspect of the first molar. The flap elevated revealing the underlying structures. Flap approximation of facial and lingual flaps are done following the debridement of the site with complete saline irrigation. Preparation of fibrin sealant along chairside to use just prior to application.

Prepared fibrin sealant applied over the margins of the approximated flap. The procedure of kirkland flap is performed on the contralateral site which is then approximated using the simple interrupted vicryl (3-0) sutures which did not require additional preparation. Average time that was taken to complete flap surgery on fibrin sealant was 55 minutes whereas the vicryl closure took only 40 minutes in total for completion. The patient was prescribed analgesics. Seventh day post-operatively, patient reviewed. Additionally, radiographs were taken to analyse the bone graft adaptation and again reviewed on the 45th day.

Post operative analysis showed no anaphylactic reaction and secondary hemorrhage. Clinically predictable results achieved on both the sites.



Figure 6: Flap approximated using fibrin sealant and vicryl sutures on right and left quadrants Respectively



Figure 7: 7th day review



Figure 8: Review on 45<sup>th</sup> day

### Discussion

Overall convenience of noting fibrin sealant even though the vicryl sutures can cause needle point bleeding, should be evaluated on the basis of cost and efficiency. It can be viewed from a patient comfort perspective, immediate discomfort is less at fibrin sealant site since there are no needle pricks and suture knot-related irritations, especially children<sup>8</sup>. In a previously performed split mouth study by Mounsif et al., dynamic and moist oral environment created a difficult environment for the clinician to apply the sealant<sup>9</sup>. Two modalities are chosen on an important consideration is cost-effectiveness. They were justified by Somani et al and Dave et al that fibrin sealants are significantly expensive, have shorter working time and require shorter and careful storage. In contrast, vicryl sutures are widely available, inexpensive and available in various sizes and structures. According to fibrin sealant may lead to foreign body reaction and alter the wound healing depending on the surgical site. Additionally, fibrin sealant is technique sensitive and requires a learning curve to help in application during the routine use when this can be achieved easily with conventional suturing methods. Moreover, fibrin sealant cannot be a reliable

substitute to vicryl sutures in periodontal flap closure even though they can aid in hemostasis and have niche application in graft stabilization and hemostatic control during surgery. They lack mechanical support and tissue coaptation over a larger surface area that might result in failure of periodontal therapy. The findings of this case report aligns with the literature that supports vicryl sutures in terms of wound healing, clinical practicality and tissue response.

### Conclusion

Fibrin sealant though with enhanced advantages like minimally invasive and early hemostasis, their higher cost, reduced mechanical strength and unpredictable adhesion of flap in the oral environment made them less applicable in daily practice. Vicryl suture showed better adaptation, reduced chairside time, faster healing and minimal post operative complications. Considering the properties of materials, selection is the key that optimizes patient-centred outcomes in society and clinical aspects. Our study reveals that vicryl sutures culminated to be more reliable over newly evolved fibrin sealant.

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