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Original Article

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A clinical study on the effect of attachable periodontal wound dressing on postoperative pain and healing

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Purpose: After periodontal surgery, studies have found that the use of periodontal wound dressing reduces the risk of wound infection and increases healing. The purpose of this study is to evaluate the effect of attachable periodontal wound dressing on the healing and patient satisfaction after periodontal flap surgery. **Materials and Methods**: Twenty-eight patients requiring periodontal surgery underwent periodontal flap surgery on both quadrants of maxilla or mandible. Postoperative pain, bleeding, dietary discomfort and hypersensitivity in relation to attachable periodontal wound dressing was assessed using Visual Analogue Scale (VAS). Additional survey on frequency of burning sensation and overall satisfaction rates were assessed. **Results**: VAS mean values for pain, bleeding, and dietary discomfort depending on the presence and absence of attachable wound dressing were; pain: 2.82, 3.96 ($P = 0.002$), bleeding: 1.61, 2.54 ($P = 0.008$), dietary discomfort: 2.82, 4.18 ($P < 0.001$), respectively. Test groups with attachable wound dressing reported significantly lower rates of discomfort. No significant difference was observed in burning sensation and hypersensitivity related with wound dressing. Satisfaction was higher in 75% of patients who received wound dressing. **Conclusion**: According to the results of this study, patients who received attachable periodontal wound dressing reported less postoperative pain, bleeding, and dietary discomfort. There was no statistical significance related to the use of wound dressing with burning sensation and hypersensitivity. **(J Dent Rehabil Appl Sci 2020;36(1):21-8)**

Key words: periodontal dressing; wound healing; postoperative care; surgical flap; visual analog scale

[Translation]

Introduction

Wound or suture sites after periodontal surgery could be consistently irritated by the tongue or food. It could lead to hypersensitivity in teeth or increased discomfort on surgical sites. In addition, the irritation could cause sutures to loosen, or more severely, secondary infection resulting in delayed wound healing. To prevent these, the use of periodontal wound dressings is recommended to protect the wound.

Periodontal wound dressings were introduced for the first time by Ward[1] in 1923. He said the periodontal wound dressing assisted wound healing, fixing teeth and soft tissues. Since then, various types of wound dressings have been developed. From the paste type applied after mixing two kinds of materials to the gel and attachable types, various types of periodontal dressings have been introduced.

Studies were actively conducted on not only components, but also the type of materials. Products containing zinc oxide eugenol were most commonly used while other products contained 5% sulfathiazole and penicillin. According to a recent study, it was more important observing how the dressing was attached to tissues than what kind of materials the dressing contained.[2]

The purpose of using periodontal wound dressings was to enhance wound healing by protecting the wound after surgery. The dressing could reduce postoperative pain and discomfort after periodontal surgery and prevent hypersensitivity by separating surgical sites from heat or overcooling.[3] In addition, it would prevent secondary inflammation by stopping the retention of bacterial deposit[4] and also aid in initial wound fixation.[5]

However, some studies presented skeptical results. According to studies by Bae[6] et al and Checchi[7] et al, there was no relation between postoperative pain and the use of periodontal wound dressing after the surgery. Greensmith[8] reported that the wound dressing could cause more serious swelling and pain, and the other study suggested that the prolonged use of periodontal dressings could cause an excessive accumulation of dental plaque on surgical sites leading to delayed wound healing and discomfort.[9]

Regarding how long the periodontal wound dressing should be attached, the research by Orban et al[5] illustrated that when the dressing was applied for more than 12 days, it delayed wound healing. It was recommended that the dressing be changed every 2 to 4 days if possible.

Recently developed wound dressings do not require any mixing procedures and can be easily applied after cutting them into the proper size or shape. The wound dressing will fall off 6 to 12 hours after being applied, so patients do not need to visit a hospital to remove it and they are less likely to suffer from delayed wound healing caused by accumulated dental plaque after prolonged use. This means that recent dressing does not cause swelling and more pain unlike previous one.

This study was designed to figure out the effect of attachable wound dressings on relieving postoperative discomfort and patient satisfaction after periodontal flap surgery.

Research Materials and Method

The study was conducted from September 2018 to March 2019 after getting approval (IRB No. DKUDH IRB 2018-06-002) from D agency Institutional Review Board, [IRB]. Participants were selected among patients with chronic periodontitis who went to the Department of Periodontology, ○○ University for treatment and were scheduled to undergo periodontal flap surgery on more than two quadrants of maxilla or mandible. The clinical study was conducted after getting consent from all participants. Regarding the sample size, researchers decided to select 28 patients with a significance level of 0.05, effective size of VAS 0.5, and 20% of expected dropout rates because 23 patients were required as a sample to achieve 75% of statistical power.

Criteria to select participants were as follows;

- Patients older than 20 years and younger than 65 years
- Patients with moderate chronic periodontitis (probing pocket depth ≥ 5 mm, when nonsurgical periodontal treatment completed)
- Patients who were scheduled to undergo periodontal flap surgery on more than two quadrants

And, exclusion criteria were as follows;

- Patients who took antibiotics or steroids within 3 months
- Patients with uncontrolled diabetes
- Patients with aggressive periodontitis
- Patients with systemic diseases that could inhibit wound healing (patients who took immunosuppressant drugs, patients with immunological disease)

The attachable periodontal wound dressing that was used in the study was Ora-Aid (TBM, Gwangju, Korea). Ora-Aid uses polymeric compounds and ethyl cellulose and polyethylene terephthalate are its main materials. It contained active ingredients including tocopheryl acetate, povidone, and carbomer and was effective in enhancing wound healing and bleeding control.

The attachable periodontal wound dressing provided two types in size (50 mm × 20 mm or 25 mm × 15 mm) and was cut into the proper shape or size to apply to surgical sites. The dressing would fall off 6 to 12 hours after being applied, so there was no need to visit a hospital to remove it.

The attachment side which covered the wound consisted of mucoadhesive polymers. When it was applied to the periodontal wound and reacted with water in the mouth, it became sticky in a short period of time and adhered to the mucosal layer. Polymers in the protection side were water-insoluble, so they covered and protected the wound in the intraoral environment (saliva, food particles). (Fig. 1).

Participants wrote an informed consent form of test trials and were randomly assigned to groups at their initial visit and underwent periodontal flap surgery on two quadrants for a total of 4 weeks. See Table 1 for detailed information of the surgical procedure.

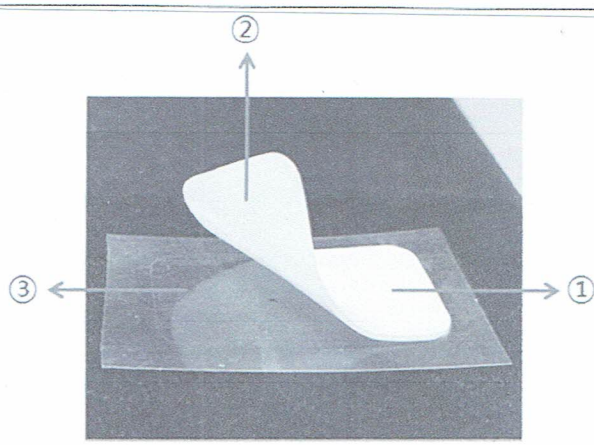

Fig. 1. Ora-Aid ① protective surface. Protect the adhesive surface. ② Adhesive side. When it meets saliva, it has adhesive properties and protects the wound site from the outside. ③ Peeling surface. As a layer to protect the adhesive surface, When applying wound dressing it removed and used.

Table 1. Surgical procedures

	Flap surgery performed on two quadrants by split mouth design
Day 0	Submit surgical and informed consent forms
	Conduct a random assignment to determine surgical sites where the periodontal wound dressing will be attached
Day 1	Perform surgery on the first site (Open flap debridement)
Day 14	Remove sutures after the first surgery
	Conduct a survey to evaluate the below items:
	1) VAS
	- Postoperative pain, bleeding, dietary discomfort, hypersensitivity
	2) Multiple choice
	- Burning sensation
	Perform surgery on the second site
Day 28	Remove sutures after the second surgery
	Conduct a survey to evaluate the below items:
	1) VAS
	- Postoperative pain, bleeding, dietary discomfort, hypersensitivity
	2) Multiple choice
	- Burning sensation
	3) Dichotomous variable
	- Patient satisfaction survey

Patients who needed periodontal treatment underwent two periodontal flap surgeries on the left/right side of maxilla or the left/right side of mandible based on the split mouth design. The attachable periodontal wound dressing was applied to surgical sites only once out of two surgeries. All surgeries were performed from the left to

right side. Participants were randomly assigned to two different groups by choosing between two papers, labelled A or B. For patients in group A, the attachable periodontal wound dressing was applied to surgical sites after the first surgery and no dressing was applied after the second surgery. In contrast, for patients in group B, the attachable periodontal wound dressing was not applied to surgical sites after the first surgery while the dressing was applied after the second surgery (Fig. 2).

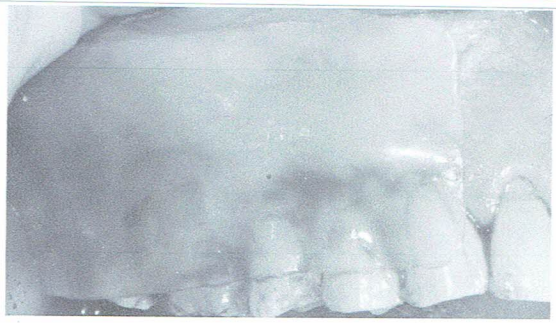

Fig. 2. Clinical photo of attachable wound dressing after periodontal flap surgery.

After periodontal flap surgery, a survey was conducted to evaluate postoperative pain, bleeding, dietary discomfort, burning sensation and hypersensitivity. Postoperative pain, bleeding, dietary discomfort and hypersensitivity were evaluated by the Visual Analog Scale (VAS) ranging from 0 (no discomfort) to 10 (worst discomfort imaginable) and burning sensations were evaluated by multiple choice (0, 1-3 times, 4-10 times, more than 10 times). Patient satisfaction was evaluated by the dichotomous variable (surgical sites with dressings, surgical sites without dressings).

The statistical significance of postoperative discomfort depending on the use of the attachable wound dressing was analyzed by using the Wilcoxon singed rank test. SPSS software version 18.0 (IBM, Armonk, USA) was utilized for statistical analysis.

Conclusion

28 patients participated in the study and there were no dropouts. The average age (±SD) of patients was 55.46(±8.56) years old and 42.8% of patients were female. When attachable periodontal wound dressings were applied (the experimental group), the average postoperative pain score was 2.82 (±2.14) in 28 surgeries. In contrast, when attachable periodontal wound dressings were not applied (the control group), the average postoperative pain score was 3.96 (±2.72). The difference between two groups in postoperative pain score was statistically significant and the average score was lower in the experimental group ($P = 0.002$). In addition, the score of discomfort caused by bleeding was 1.61 (±1.85) in the experimental group and 2.54 (±2.52) in the control group respectively, and the difference was statistically significant ($P= 0.008$). On a survey to evaluate dietary discomfort after the surgery, the average score in the experimental group was 2.82 (±2.23) while the average score in the control group was 4.18 (±3.02). When attachable periodontal wound dressings were applied, patients felt less dietary discomfort and this difference was statistically significant ($P < 0.001$). In contrast, regarding the discomfort caused by hypersensitivity

after the surgery, the score was presented 1.96 (± 2.24) and 2.54 (± 2.66) respectively depending on the use of the attachable periodontal wound dressing, and the difference was not statistically significant (P = 0.074, Table 2).

There was no significant difference between the experimental group and the control group in the multiple choice survey to evaluate discomfort causes by a burning sensation. Only two patients in the control group answered that they felt discomfort more than 10 times on the burning sensation survey while there was only one in the experimental group who answered the same on the survey. 18 patients in the control group reported that they did not feel discomfort due to a burning sensation while 19 patients in the experimental group answered the same. There was one more patient in the experimental group than in the control group who said that they did not feel a burning sensation and the difference was not statistically significant (Table 3).

When a survey was conducted to evaluate patient satisfaction on surgical sites after attachable periodontal wound dressings were applied to one of two surgical sites following two surgeries by split mouth design, 75% of patients (21 patients) chose the surgical sites with the attachable periodontal wound dressing while 18% of patients (5 patients) answered that they did not feel any difference between surgical sites with the dressing and without the dressing. 7% (2 patients) chose the surgical sites without the dressing on the survey (Fig. 3).

Table 2. Severity of discomfort (VAS score) in surgical sites with and without attachable periodontal wound dressing

Discomfort	Use of attachable periodontal wound dressing	Severity of discomfort (VAS discomfort score out of 10)				*P* value
		Mean	SD	Minimum	Maximum	
Pain	Yes	2.82	2.72	0	8	0.002*
	No	3.96	2.14	0	10	
Bleeding	Yes	1.61	1.85	0	8	0.008*
	No	2.54	2.52	0	8	
Intake	Yes	2.82	2.23	0	8	< 0.001*
	No	4.18	3.02	0	10	
Hyper-sensitivity	Yes	1.96	2.24	0	8	0.074
	No	2.54	2.66	0	8	

* Significantly different ($P < 0.05$).
SD: standard deviation, Vas: visual analogue scale.

Table 3. Burning discomfort

Use of attachable periodontal wound dressing	Yes	No
0	19	18
1 - 3 times	6	7
4 - 10 times	2	1
≥ 10 times	1	2
Total	28	28

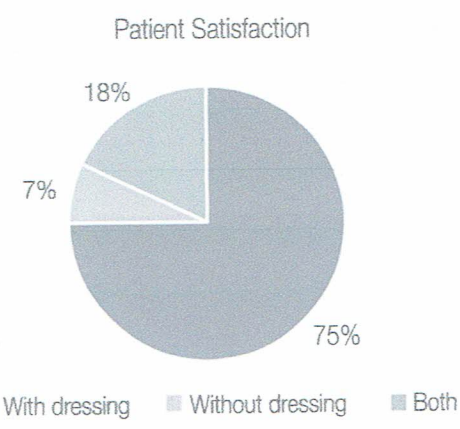

Fig. 3. Surgical Site Satisfaction Survey. 75% of the subjects selected surgical sites using attachable wound dressing.

Discussion

Baer[10] reported that the purpose of the periodontal wound dressing was to relieve postoperative pain and discomfort and facilitate the initial wound healing by preventing additional damage on surgical sites in the process of healing. Patients felt less postoperative pain after the periodontal wound dressing was applied because the dressing could fix the wound, helping the clot stabilize and protect the wound from physical irritations. The study results also presented the association between the use of attachable periodontal wound dressings and postoperative pain, bleeding, and dietary discomfort; there was a statistically significant difference. When the attachable periodontal wound dressing was applied, patients were less likely to feel discomfort.

Regarding discomfort driven by burning sensations, the lower average score was presented in the experimental group which an attachable periodontal wound dressing was applied, but the difference was not statistically significant. Normally, patients felt more burning sensations when the primary closure was not achieved,[11] but periodontal flap surgery performed on this study was open flap debridement, which meant that primary closure was achieved in most sites. In this regard, the difference between the control group and the experimental group was not statistically significant.

VAS was one of the most commonly used ways to measure pain. It was widely used to evaluate not only pain, but also other psychological statuses (depression, anxiety neurosis), symptoms by severity levels (nausea, fatigue, and dyspnea), functions, or even the quality of life.[12] It was easy to use VAS under various environments and researchers did not need to spend lots of time learning how to use it. Measured data could be statistically processed.[13] In addition, the pain that patients felt recently could be measured by looking at historical data with VAS. In this regard, VAS was chosen to conduct the survey because it was considered to be the most suitable way to evaluate pain after periodontal surgery by spilt mouth design.[14]

Survey items such as postoperative pain and discomfort level could differ from patient to patient because it was very subjective data reflecting on an individual's complicated experience and emotional status. To achieve more accurate data, patients underwent flap surgeries by split mouth design on multiple sites and had attachable periodontal wound dressings on half of the surgical sites. By doing so, it could reduce the influence of individual factors on the survey and evaluate the effect of treatment in a more accurate way even though the sample size was small.[15]

Ora-Aid used in the study was an attachable strip type and easier to use than paste type products. Many patients felt discomfort when the paste type wound dressings were applied to intraoral wounds because of a foreign substance in their mouth. In contrast, the attachable wound dressing was thin enough to feel less discomfort. Heaney[16] reported that patients were more likely to suffer inflammation when attachable periodontal dressings were applied, even though the dressing itself did not damage tissue. This was because the periodontal dressings would cause the accumulation of dental plaque that could cause irritation on tissues during the healing process. On the same study, the periodontal dressings should be removed within one week after the surgery to prevent the

accumulation of dental plaque. Attachable periodontal wound dressings became sticky gel after reacting with saliva and fell off 6 to 12 hours after being applied. Patients could easily remove the dressings by themselves and did not need to visit a hospital for removal. In addition, patients were less likely to suffer delayed wound healing caused by accumulated dental plaque.

On this study, the main reason that could aggravate postoperative pain and discomfort was considered to be the use of attachable periodontal wound dressings, but there were other factors. Basically, postoperative pain and discomfort were more highly associated with surgical sophistication and operative time than the use of periodontal dressings. There were also other factors that could affect postoperative pain and discomfort such as osseous surgery, the volume of the latrogenic internal phase, and etc. These factors would affect not only postoperative discomfort, but also throughout the process of wound healing.[17]

Attachable periodontal wound dressings can be applied to surgical sites or wounds caused by not only periodontal flap surgery, but also apically positioned flap, tooth extraction, gingivectomy, intraoral wound, and stomatitis. Especially, many patients who underwent free gingival graft suffered from discomfort caused by bleeding due to a damaged cutaneous branch of the greater palatine artery on palatal donor sites and pain in the exposed de-epithelialized wound without primary closure. When attachable periodontal wound dressings were applied to donor sites after the free gingival graft, patients felt less discomfort caused by a foreign substance in their mouth because the dressings were thin enough to use on the palate. In addition, the dressings were tightly attached to healthy gingiva helping hemostasis by protecting clots. Furthermore, the dressings helped initial wound healing by assisting in closing the wound and protecting it from inflammation or irritation by the tongue or food particles. In a trial test, the use of the attachable periodontal wound dressing was effective in hemostasis and wound healing even though donor sites were not closed with sutures (Fig. 4).

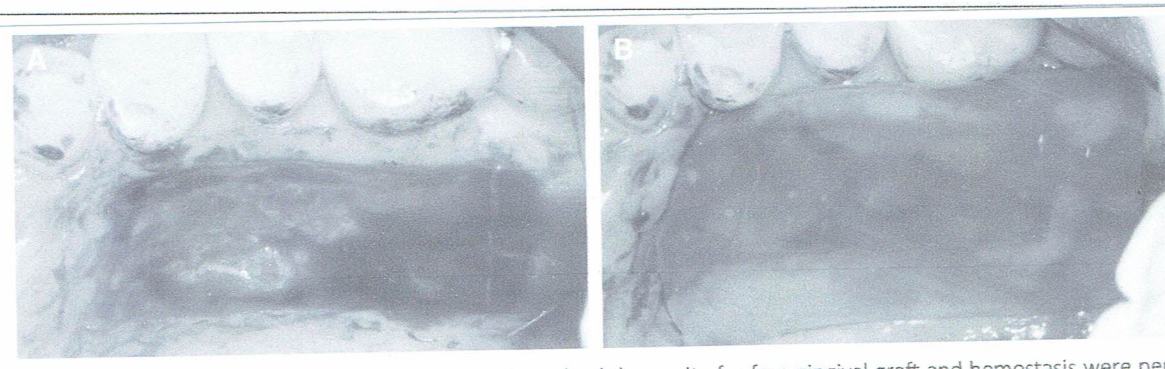

Fig. 4. Attachable wound dressing was applied to the palatal donor site for free gingival graft and hemostasis were performed without additional suture.

Conclusion

28 patients attended to the Department of Periodontology, OO University for treatment were surveyed to evaluate the effect of attachable periodontal wound dressings on relieving postoperative pain or discomfort and patient satisfaction after the periodontal flap surgery. The survey results were as follows:

1. A group with the attachable wound dressing was less likely to suffer pain, bleeding and dietary discomfort after the surgery and this difference was statistically significant.

2. No significant difference was observed between the two groups with and without the attachable wound dressing regarding burning sensation and hypersensitivity.

3. In terms of satisfaction, 75% of patients preferred surgical sites with the attachable wound dressing, 18% mentioned that they could not feel differences, and 7% chose surgical sites without the dressing.

As a result, the use of attachable wound dressings was recommended for the purpose of reducing pain, bleeding, and dietary discomfort, but additional studies will be needed to figure out how long the surgical sites should be covered by the dressing, adhesiveness, and the shape of it.

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Key words: periodontal dressing; wound healing; postoperative care; surgical flap; visual analog scale

[번역요청]

서론

구강내에서 시행되는 수술 후 생긴 창상이나 봉합면은 혀나 음식물 등으로부터 지속적인 자극이 가해질 수 있다. 이로 인해 치아의 지각 과민이 생기거나 술부의 불편감이 증가될 수 있다. 또한, 이러한 자극은 봉합사를 풀리게 만들거나 심한 경우 이차 감염을 발생시켜 치유를 지연시킨다. 이를 방지하기 위해 창상면을 보호하는 치주포대의 이용이 제안되었다.

치주 포대는 1923 년 Ward[1] 가 처음 소개하였으며, 그는 치주 포대가 치아와 연조직의 움직임을 막아주어 치유에 도움이 된다고 하였다. 이후 다양한 종류의 치주포대들이 개발되었으며 현재는 두 가지 제형을 혼합하여 사용하는 페이스트 형태부터 젤형, 부착형 등 다양한 성상의 치주포대가 출시되고 있다.

성상 뿐 아니라 성분에 관한 연구도 활발히 이루어졌는데, 산화아연유지놀을 함유한 제품이 많았고, 5%의 설파티아졸이나 페니실린을 첨가한 제품 등도 있었다. 그러나 최근 연구에 따르면 포대 안의 성분보다는 포대와 조직간의 긴밀한 표면접촉이 중요한 역할을 하는 것으로 밝혀졌다.[2]

치주 포대의 사용 목적은 수술 후 창상을 보호하여 치유를 돕는 것이다. 또한 치주 수술 후 발생하는 동통을 감소시키고 수술 부위 치아를 온, 냉 자극으로부터 격리하여 과민증을 예방함으로써 환자의 불편감을 줄여줄 수 있다.[3] 그 밖에도, 창상에 세균성 침착물의 저류를 방지하여 이차 감염을 막을 수 있도록 하며,[4] 창상의 초기 고정을 돕는다.[5]

반면 치주 포대의 사용과 관련하여 회의적인 연구 결과들도 있다. Bae 등 [6] 과 Checchi 등 [7] 은 수술 후 동통과 치주포대의 적용 유무는 연관이 없다고 보고하였다. Greensmith[8] 는 포대를 사용할 경우 오히려 더 심한 종창과 동통이 발생한다고 보고하였고, 또 다른 연구에서 이러한 치유 지연과 불편감의 원인으로 포대의 장기간 유지로 인한 수술부위의 과도한 치태 침착 가능성이 제기되었다.[9]

치주 포대의 부착기간과 관련하여 Orban 등 [5] 은 치주포대의 사용이 12 일을 초과할 경우 치유를 지연시킨다고 하였고, 가능하다면 2 - 4 일 간격으로 포대를 교체해줄 것을 권하고 있다.

최근 개발된 부착형 창상 피복재의 경우 별도의 혼합과정 없이 쉽게 원하는 모양으로 다듬어 환부에 적용할 수 있다. 또한, 부착 후 6 - 12 시간 정도 유지되다가 자연 탈락하므로 발사 전에 피복재를 제거하기 위해 별도로 병원을 재 내원하지 않아도 되며, 장기간 부착된 피복재로 인한 치태축적이 치유를 방해할 가능성이 낮기 때문에 기존의 치주포대에서처럼 종창 및 통증을 유발할 위험이 없다.

본 연구에서는 치주판막 수술 후 부착형 창상 피복재의 적용 유무에 따라 환자가 느끼는 술 후 불편감과 환자의 수술 만족도에 대해 조사하고자 한다.

연구 재료 및 방법

본 연구는 D 기관 윤리심의위원회(Institutional Review Board, [IRB])의 승인(IRB No. DKUDH IRB 2018-06-002)을 얻은 후 2018 년 9 월부터 2019 년 3 월까지 진행되었다. 실험은 ○○대학교 치과병원 치주과에 내원하는 중등도

만성치주염 환자 중 상악 또는 하악의 2 사분악 이상에서 치은박리소파술이 예정되어 있는 자 가운데, 자발적으로 본 임상연구에 참여하기로 동의한 환자를 대상으로 하였다. 표본의 크기와 관련하여 유의수준 0.05 에서 VAS 0.5 점 차이를 유효크기로 하여 75%의 검정력을 갖기 위한 표본 수는 23 명이며, 중도 탈락율을 20%로 설정하고 총 28 명의 환자를 모집하였다.

연구 대상자의 선정 기준은 다음과 같다;

- 만 20 세 이상 65 세 미만
- 중등도(probing pocket depth ≥ 5 mm, 비외과적 치주치료를 종결한 경우) 만성치주염 환자
- 2 사분악 이상에서 치은박리소파술이 예정되어 있는 자

또한, 제외 기준은 다음과 같다;

- 최근 3 개월 이내 항생제, 스테로이드를 복용한자
- 조절되지 않는 당뇨 환자
- 급진성 치주염 환자
- 기타 창상 치유를 저해하는 전신병력이 있는 자(면역억제제 복용 중인 자, 면역질환자)

본 연구에 사용된 부착형 창상 피복재는 Ora-Aid (TBM, Gwangju, Korea)로 에틸셀룰로오스와 폴리에틸렌테레프탈레이트를 주성분으로 하는 고분자화합물로 토코페롤아세테이트와 포비돈, 카보머 등의 유효성분을 포함하여 창상치유, 지혈효과를 가진다.

부착형 창상 피복재는 두 가지 크기(50 mm × 20 mm 또는 25 mm × 15 mm)로 제공되며 치주 수술 봉합 후 원하는 크기로 다듬어, 수술 부위에 적용한다. 이후 평균 6 - 12 시간 부착 상태를 유지하다가 탈락하므로 별도의 제거를 위한 내원이 필요하지 않다.

창상과 접촉하는 접착면은 점막부착성 고분자로 단시간 내에 구강내의 수분과 반응하여 겔 상태로 변화하고 이후 점착성이 발생하여 점막에 부착된다. 보호면의 고분자는 불수용성으로 창상을 덮어 구강내의 환경(타액, 음식물 등)으로부터 환부를 보호한다(Fig. 1).

실험에 참여한 환자들은 처음 내원 시 임상연구에 관한 설명동의서 작성과 무작위 그룹 배정을 시행하였고, 총 4 주에 걸쳐 두 분악에 치주 판막수술을 시행하였으며, 자세한 수술 일정은 Table 1 과 같다.

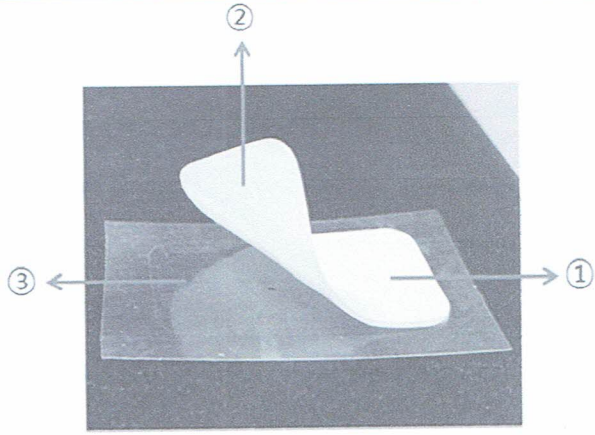

Fig. 1. Ora-Aid ① protective surface. Protect the adhesive surface. ② Adhesive side. When it meets saliva, it has adhesive properties and protects the wound site from the outside. ③ Peeling surface. As a layer to protect the adhesive surface, When applying wound dressing it removed and used.

Table 1. Surgical procedures

Split mouth design 으로 사분악 중 양측 flap surgery 시행	
Day 0	수술 및 설명동의서 작성 무작위 배정을 통한 부착형 창상피복재 적용 부위 결정
Day 1	첫 수술 부위 수술 시행(Open flap debridement)
Day 14	첫 수술 부위 발사 진행 설문을 통하여 다음 항목 조사 1) VAS - 술 후 통증, 출혈, 식이 불편감, 지각과민 2) 사지선다 - 작열감 두 번째 수술 부위 수술 진행
Day 28	두 번째 수술 부위 발사 진행 설문을 통하여 다음 항목 조사 1) VAS - 술 후 통증, 출혈, 식이 불편감, 지각과민 2) 사지선다 - 작열감 3) 이분형 변수 - 수술 만족도 조사

2 사분악 이상의 치주치료가 예정된 환자를 대상으로 상악 좌·우측 또는 하악 좌·우측을 split mouth design 하여, 양쪽 모두 치은박리소파술을 시행하며 두 번의 수술 중 한번은 부착형 창상 피복재를 적용하고 다른 한번은 적용하지 않았다. 모든 환자에서 수술은 좌측에서 우측 순서로 진행되었다. 피험자를 A 와 B 가 적힌 종이를 이용하여 무작위로 두 그룹으로 배정하였다. A 그룹은 두 번의 예정된 수술 중 첫 번째 수술 시 부착형 창상 피복재를 적용하고, 두 번째 수술 시에는 적용하지 않았다. 이와 반대로 B 그룹은 첫 번째 수술 시에 부착형 창상 피복재를 적용하지 않고, 두 번째 수술 시에 부착형 창상 피복재를 적용하였다(Fig. 2).

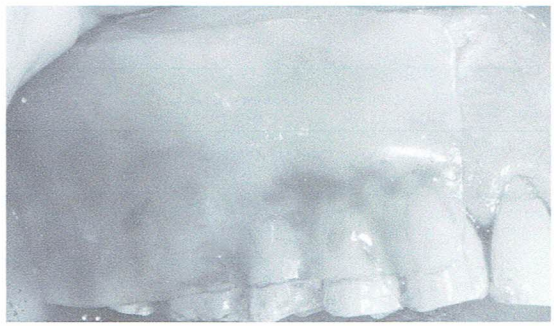

Fig. 2. Clinical photo of attachable wound dressing after periodontal flap surgery.

수술 후 설문 조사를 통해 수술 후 동통, 출혈, 식이 불편감 및 작열감, 지각 과민에 대해 조사하였다. 동통, 출혈, 식이 불편감, 지각 과민은 Visual Analog Scale (VAS)를 사용하여 '0 (불편감 없음)'에서 '10 (최악의 상상할 수 있는 불편감)'까지로 평가하였고, 작열감은 4 개의 사지선다(0 회, 1 - 3 회, 4 - 10 회, 10 회 이상), 만족도는 이분형 변수(적용부위, 비적용부위)로 평가하였다.

Wilcoxon singed rank test 를 사용하여 부착형 창상 피복재의 유무에 따른 술 후 불편감의 통계적 유의성을 분석하였다. 통계 분석은 SPSS 소프트웨어 version 18.0 (IBM, Armonk, USA)를 사용하였다.

결과

총 28 명의 환자가 연구에 포함되었으며 중도 탈락된 경우는 없었다. 환자의 평균(±SD) 연령은 55.46 (±8.56) 세였으며, 전체 42.8%가 여성이었다. 부착형 창상 피복재를 적용한 경우(실험군) 28 번의 수술에서 평균 술 후 동통 점수는 2.82 (±2.14)이다. 이에 반해, 부착형 창상 피복재를 사용하지 않은 경우(대조군)에서 술 후 동통 점수는 3.96 (±2.72)으로 두 군간의 동통 차이는 통계적으로 유의하였으며, 실험군에서 적었다(P = 0.002). 또한, 출혈로 인한 불편감에 대한 점수는 실험군과 대조군에서 각각 1.61 (±1.85), 2.54 (±2.52)로 부착형 창상 피복재를 적용한 그룹에서 적었으며, 통계적으로 유의하였다(P= 0.008). 수술 후 식이 섭취의 불편감에 관한 설문에서 실험군의 평균은 2.82 (±2.23)였으며, 대조군의 평균은 4.18 (±3.02)였다. 부착형 창상 피복재를 적용한 경우가 통계적으로 유의하게 식이 불편감이 적었다(P < 0.001). 이에 반해, 수술 후 지각 과민으로 인한 불편감에 대한 점수는 부착형 창상 피복재의 적용 유무에 따라 각각 1.96 (± 2.24), 2.54 (± 2.66)로 나타났으며, 통계적으로 유의한 차이가 관찰되지 않았다(P = 0.074, Table 2).

사지선다를 이용하여 조사한 작열감으로 인한 불편감에서는 실험군과 대조군 간의 차이가 크지 않았다. 작열감 평가에서 10 회 이상의 불편감을 느낀 사람은 대조군에서 2 명이었으며, 실험군에서는 1 명으로 상대적으로 적었으며, 불편감을 느끼지 못했다고 응답한 사람의 수도 대조군 18 명, 실험군 19 명으로 실험군에서 더 많았으나, 두 군간의 통계적으로 유의미한 차이는 없었다(Table 3).

Split mouth 로 두 번의 수술을 경험하면서 한쪽은 창상 피복재를 부착하고 다른 한쪽은 부착하지 않았던 실험 대상자들에게 각각의 수술부위에 대한 만족도를 조사하였을 때 75% (21 명)의 환자가 부착형 창상 피복재를 적용한 수술부위를 선택하였고, 18% (5 명)의 환자가 양 수술부위의 수술만족도 차이가 없다고 응답했다. 부착형 창상 피복재를 적용하지 않은 수술이 더 만족스럽다는 대답은 전체 환자 중 7% (2 명)였다(Fig. 3).

Table 2. Severity of discomfort (VAS score) in surgical sites with and without attachable periodontal wound dressing

Discomfort	Use of attachable periodontal wound dressing	Severity of discomfort (VAS discomfort score out of 10)				*P* value
		Mean	SD	Minimum	Maximum	
Pain	Yes	2.82	2.72	0	8	0.002*
	No	3.96	2.14	0	10	
Bleeding	Yes	1.61	1.85	0	8	0.008*
	No	2.54	2.52	0	8	
Intake	Yes	2.82	2.23	0	8	< 0.001*
	No	4.18	3.02	0	10	
Hyper-sensitivity	Yes	1.96	2.24	0	8	0.074
	No	2.54	2.66	0	8	

* Significantly different ($P < 0.05$).
SD: standard deviation, Vas: visual analogue scale.

Table 3. Burning discomfort

Use of attachable periodontal wound dressing	Yes	No
0	19	18
1 - 3 times	6	7
4 - 10 times	2	1
≥ 10 times	1	2
Total	28	28

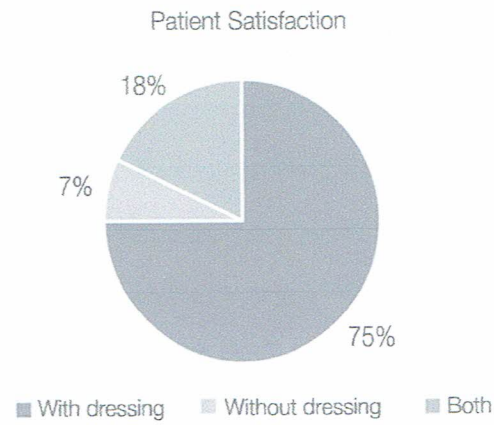

Fig. 3. Surgical Site Satisfaction Survey. 75% of the subjects selected surgical sites using attachable wound dressing.

고찰

Baer[10] 는 치주 포대 사용의 목적을 환자의 동통과 불편감 감소 그리고 치유기간 동안에 추가적인 손상을 방지하여 창상의 초기치유가 원활하게 이루어질 수 있도록 하는 것이라 하였다. 치주 포대 부착 시 동통이 감소하는 이유는 포대가 창상 부위를 고정하여 혈병 안정화를 돕고, 물리적인 자극으로부터 환부를 보호하기 때문이다. 본 실험결과에서도 부착형 창상 피복재의 사용 유무와 동통, 출혈, 식이 불편감 간에 통계적으로 유의미한 차이가 있었으며, 부착형 창상 피복재를 적용한 경우 불편감이 적었다.

화끈거리는 통증으로 인한 불편감에 관해서는 부착형 창상 피복재를 부착한 실험군에서 평균값이 좀 더 작았으나 통계적으로 유의한 차이는 없었다. 작열감의 경우 창상의 일차 피개(primary closure)가 되지 않는 경우 증가하는데,[11] 본 실험에서 시행한 치주판막수술은 open flap debridement 형태로 모든 부위에서 일차 피개(primary closure)가 이루어지므로 대조군과 실험군 간에 통계적으로 유의한 차이가 없었던 것으로 생각된다.

VAS 는 통증의 정도 측정에 가장 일반적으로 사용되는 방법 중 하나로, 통증 뿐만 아니라 다른 심리 현상(우울증, 불안신경증 등)이나 증상의 정도(오심, 피로, 호흡곤란 등), 기능이나 삶의 질 등을 측정하는 데에도 폭 넓게 이용되고 있다.[12] VAS 는 다양한 환경에서 쉽게 사용이 가능할 뿐 아니라 측정자가 사용하기 전 방법을 숙지하기 위해 필요한 연습시간이 적다. 또한, 측정된 자료는 통계처리가 가능하다.[13] 그 밖에 VAS 는 회상을

통해 최근에 느꼈던 통증에 대한 평가가 가능하다는 점 때문에 본 실험에서는 split mouth design 에서 통증을 평가하는데 가장 적절하다고 생각되어 VAS 방식을 선택하여 설문을 진행하였다.[14]

동통이나 불편감이라는 검사 항목은 환자에 따라 상당히 주관적인 성질의 자료로써 개개인의 복잡한 경험과 심리상태를 반영한다. 이를 잘 평가하기 위해 본 실험에서 설계한 split mouth design 의 경우 동일한 대상의 서로 다른 부분에 같은 술식을 적용 후 한 쪽은 부착형 창상 피복재를 적용하고 다른 한쪽은 적용하지 않음으로써 적은 수의 표본 집단이라도 개인의 특성에 따른 영향을 줄여주어 치료효과를 보다 정확하게 평가할 수 있다.[15]

본 연구에서 사용한 부착형 창상 피복재(Ora-Aid)의 경우 부착 스트립형으로 기존 페이스트 형태의 제품에 비해 조작이 간편하고 부착이 쉽다. 또한 페이스트 형태의 치주포대를 구강내 적용한 경우 이물감 때문에 불편감을 호소하는 환자들이 많은 반면 부착형 창상 피복재는 두께가 얇아 이물감이 낮다. Heaney[16] 에 따르면 치주포대를 사용한 경우 포대 자체가 조직에 해를 끼치는 것은 아니나 사용하지 않은 부위보다 염증이 더 심한 경우가 있다고 하였는데, 이는 포대가 치태침착을 유발하여 치유 중인 조직에 자극을 가한 결과로 생각된다. 또한 동일한 연구에서 치태침착이 치유에 영향을 미치는 것을 막기 위해 수술 후 1 주일 내에 포대를 제거해야 한다고 말했다. 이러한 점에서 부착형 창상 피복재의 경우 타액과 접촉 시 겔화되어 접착력이 발생하고 평균 6 - 12 시간 지속 후 접착면이 분해되어 자연 탈락하여 환자 스스로 제거가 가능하다. 따라서 피복재 제거를 위한 재내원이 필요하지 않으며 치태침착으로 인한 불량한 치유에 대한 우려가 적다.

본 연구에서는 치주수술 후 동통과 불편감에 영향을 주는 요인으로 부착형 창상 피복재의 사용 유무를 설정하였지만, 포대 사용 유무 외에 영향을 줄 수 있는 요소들이 있다. 기본적으로 동통과 불편감의 정도는 포대 사용유무보다 수술의 정교함과 수술 시간 등에 민감하며, 그 외 영향을 주는 요소로는 골 수술 여부, 의원성 외상의 양 등이 있다. 또한 이러한 요소들은 동통과 불편감 뿐 아니라 치유과정에 전반적으로 영향을 주게 된다.[17]

치주판막수술 외에 부착형 창상 피복재의 적용이 가능한 부위는 근단변위판막술, 발치와, 치은절제술, 구강내 창상, 구내염 등이 있다. 특히 유리치은이식술 시 구개부공여부의 경우 대구개동맥의 부가지가 손상되어 출혈로 인한 불편감이 발생하거나 일차피개 없이 노출된 탈상피화 부위의 통증을 호소하는 경우가 많다. 유리치은이식술 공여부에 부착형 창상 피복재를 적용한 경우 두께가 얇아 구개부에 부착하여도 이물감이 크지 않으며, 공여부 주변 건전한 치은에 견고하게 부착되어 내부에 혈병을 가두어 지혈을 돕는다. 또한 노출된 창상을 피개하여 혀나 음식물에 의한 자극을 막고 감염을 방지하여 초기치유를 돕는다. 실제 임상에서 지혈을 위한 별도의 공여부 봉합없이 부착형 창상 피복재의 사용만으로 충분한 지혈효과와 치유결과를 얻었다(Fig. 4).

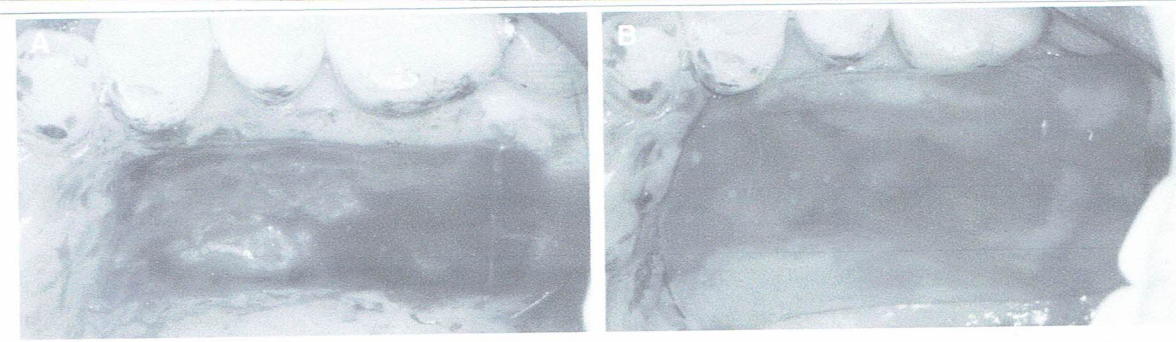

Fig. 4. Attachable wound dressing was applied to the palatal donor site for free gingival graft and hemostasis were performed without additional suture.

결론

부착형 창상 피복재의 치주판막수술 후 사용유무에 대해 술 후 발생되는 동통이나 불편감의 정도와 선호도 등을 조사하기 위해 ○○대학교 치과대학 부속 치과병원 치주과에 내원한 환자 28 명을 대상으로 설문한 결과 다음과 같은 결론을 얻었다.

1. 술 후 동통, 출혈, 식이 불편감의 정도는 부착형 창상피복재 적용 군이 적용하지 않은 군에 비하여 통계적으로 유의하게 불편감이 적었다.

2. 술 후 발생하는 작열감, 지각 과민에 대한 분석에서 부착형 창상피복재 사용 여부에 따른 두 군간에 통계적으로 유의한 차이가 없었다.

3. 수술에 대한 환자 만족도 검사에서 75%의 환자가 부착형 창상피복재를 적용한 수술부위를 선택하였고, 18%가 별다른 차이가 없었다고 하였으며, 7%가 부착하지 않은 경우를 선택하여 창상 피복재의 사용을 원치 않았다.

이상의 결과로 치주판막수술 후 동통과 출혈, 식이 불편감 감소를 목적으로 부착형 창상 피복재의 사용은 권유되나, 향후 부착시간 조절이나 부착력, 형태 등에 대한 추가적인 연구가 필요할 것으로 사료된다.

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