An evaluation of decision-making in the treatment of combined periodontal-endodontic in Lao patient, Faculty of Dentistry, Lao PDR

ABSTRACT

Background: Periodontal disease and endodontic problem is a major problem affecting human dentition, Early diagnosis and evaluation of the results of periodontal treatment is important for controlling the disease.

Objective: To compare the efficacy of various treatment of periodontal disease on periodontal root planning, root canal filling technique and root canal filling combined periodontal open flap technique.

Method: A Cross-sectional clinical descriptive study within 40patients who was diagnosis periodontal diseases which peri pocket depth (PD 4-9 mm) who were recruited from patients seeking treatment at dental clinic, Faculty of dentistry University of Health Sciences,

group one treatment by scaling, root planning and root canal filling, group two combine periodontal open flap and root canal treatment, all group were followed up by BOP, PD, CAL on the day 90, all data using Program STATA 14 to analysis percentage, difference mean by each group with Paired test and Unpaired test.

Results: After treatment both types of treatment root canal filling combined with root planning and root canal filling combined with periodontal open flap the patient cleans the teeth better, Inflammation is reduced effectively, the reduction of pocket depth and gain in the clinical attachment level**.**

Conclusion: After compared result of all clinical indicators between Two type treatment including Bleeding on probing (BOP), Pocket depth (PD) and Clinical attachment level (CAL) were not different. It is suggested that for patients with the perio-endo (PD 4-9 mm) the dentist while considering on a treatment option should hence explain an integrated approach of taking proceed into consideration with patients and thereby providing each individual patient with the best possible option.

Key words: Periodontal disease, endodontic, treatment open flap and root planning

Introduction

Periodontal disease and endodontic problem are a major problem affecting human dentition. Treatment may be performed by a periodontist, a dentist or a dental hygienist. The goal of periodontitis treatment is to thoroughly clean the pockets around teeth and prevent damage to surrounding bone [1, 2]. The adopting a daily routine of good oral care, manage health conditions that may impact dental health and stop tobacco use [3, 4]. Two types of international treatment method widely used are Nonsurgical treatments and Surgical treatments [5, 6]. Nonsurgical treatments are including scaling which removes tartar and bacteria from your tooth surfaces and beneath your gums. It may be performed using instruments, a laser or an ultrasonic device. Root planning smooths the root surfaces, discouraging further buildup of tartar and bacteria, and removes bacterial byproducts that contribute to inflammation and delay healing or reattachment of the gum to the tooth surfaces and antibiotics can help control bacterial infection. Topical antibiotics can include antibiotic mouth rinses or insertion of gels containing antibiotics in the space between your teeth and gums or into pockets after deep cleaning. The second method is surgical treatments which are including Flap surgery (pocket reduction surgery), Soft tissue grafts, bone grafting, guided tissue regeneration and tissue-stimulating proteins. If not treated for periodontitis, the supporting structures of your teeth, including the bones of your jaw, can be destroyed. Your teeth loosen and might fall out or require extraction. Other complications of periodontitis include: painful abscesses, migration of your teeth, which may interfere with eating, receding gums and exposure of the roots of your teeth, increased risk of complications during pregnancy, including low birth weight and preeclampsia and increased risk of heart disease, respiratory disease, and diabetes [7]. Therefore, early diagnosis and evaluation of the results of periodontal treatment is important for controlling the disease. A study reported that the most common periodontal problem was calculus deposits, found in 3-5 sextants of all age groups. The pocket depth was 4-5 mm on average [8]; However, there is not studied in Vientiane capital and another province in Laos.

Faculty of Dentistry is belonging to University of Health Sciences. In last year, almost 4,035 patients came to get services in Periodontology unit, Department of Endodontic, Faculty of Dentistry, University of Health Sciences. There were 807 cases with periodontal disease combine pulp necrosis, average 3 cases per day. However, the standard treatment method is not exactly determined in Lao PDR. This pinpointed issue is really important and necessary to be studied for determination of accurate and the best treatment method on periodontal disease. Therefore, 3 this

study aims to compare and choose the most effective method for further treatment of periodontal disease in faculty. To compare the efficacy of periodontal treatment between root canal filling combined with root planning and root canal filling combined with periodontal open flap technique in the patients with perio-endo.

Research Methodology

Cross-sectional clinical descriptive study, 40 patients with the perio-endo (PD 4-9 mm) who were recruited from patients seeking treatment at dental clinic Faculty of dentistry University of health Sciences Lao PDR, group one treatment by scaling , root planning and root canal filling, group two treatment by periodontal open flap and root canal filling, all group were follow up by BOP, PD, CAL on the day 120, all data using Program STATA 14 to analysis percentage, difference mean by each group with Paired test and Unpaired test as following flow chart; **Ethical statement**
The research was submitted and approved by University of Health Sciences, Vientiane, Lao PDR (Reference No: 234/20).

Patient with pulp and infectious of soft tissue and also have problem with periodontal disease who are enroll to treatment in Periodontal Department with divide into 2 technique of treatment by root planning or open flap and endodontic treatment depend on how severe of perio pocket depth between 6-9 mm, patient was consist into two technique of treatment case in group 1: root planning and endodontic and case in group 2: open flap and combine endodontic treatment.

Case in group 1: Root planning and endodontic

After root canal treatment, Open flap technique to remove the inflammatory dental alveolar bone treatment and repair pocket depth. To open flap local anesthesia was done by 2% Lidocaine within epinephrine 1:100.000 in appropriate dose. This deep cleaning has two parts. Scaling to removes all the plaque and tartar (hardened plaque) above and below the gumline and deep into bottom of the pocket. root planning subgingival root surfaces with a curette to remove the infection tissue surround periodontal and wash out with saline until structure is clear. In case of result by root plaining is fell, it will refer to another treatment.

Medicine (drug suspension):

Amoxicillin 500 mg, 2 tablets times 3 per day during 7 days, Ibuprofen 400 mg, 1 tablet every 6 or 8 hours after meal during 5 days, Chlorhexidine gluconate 0.12 % rinse one a day during 2 weeks and also asked the patient to give oral health hygiene after that recall for checkup in 90 days and X-Ray for evaluate result of treatment.

Case in group 2: Open flap and combine endodontic treatment

After root canal treatment, Open flap technique to remove the inflammatory dental alveolar bone treatment and repair pocket depth. To open flap local anesthesia was done by 2% Lidocaine within epinephrine 1:100.000 in appropriate dose, reverse bevel incision is made at the attached gingiva angled to excise the periodontal pocket. Two releasing incisions are made mesial and distal to the defect gingival crest 1-3 mm. after the flap is elevate, pocketing tissues are discarded, osseous surgery can be performed, and the flap us then apically reposition and sutured.

Medicine (drug suspension):

Amoxicillin 500 mg, 2 tablets times 3 per day during 7 days, Ibuprofen 400 mg, 1 tablet every 6 or 8 hours after meal during 5 days, Chlorhexidine gluconate 0.12 % rinse one a day during 2 weeks and also asked the patient to give oral health hygiene after that recall for checkup in 10 days.

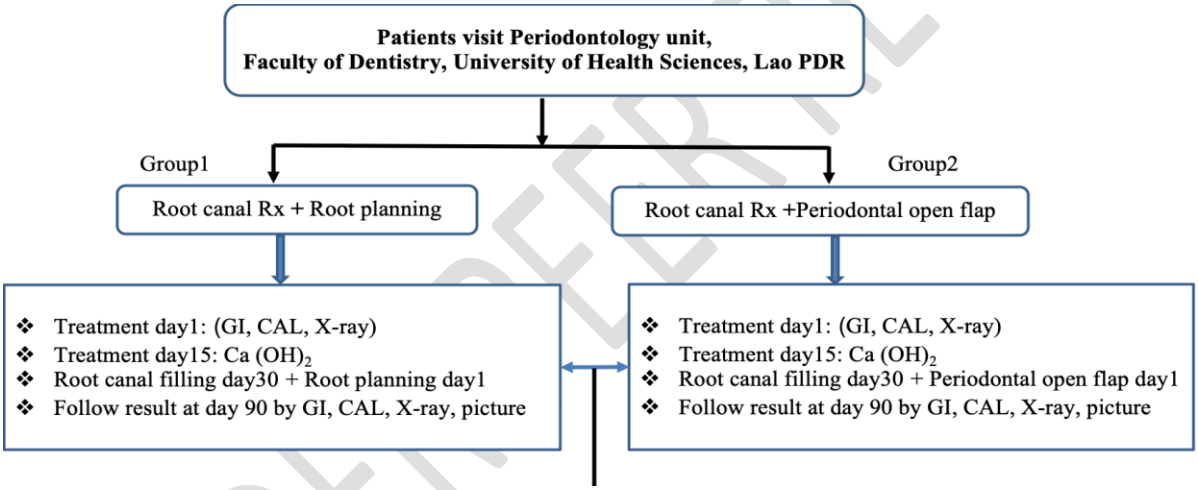

Fig 1. Flow chart showing Periodontology unit

Result

In this study, 40 participants were aged 35–55-year-old. The first group root canal filling combined with root planning had 20 patients with mean age (42.5 ± 5.75) and the second group root canal filling combined with periodontal open flap technique with 20 patients with mean age (45.0 ± 7.75). Both two group the participants composed by female (70.0%) and male (30.0%) (Table 1).

Table1. characteristics of participants.

Variable	Group1	Group2
	Root canal filling combined	Root canal filling combined with

	with root planning	periodontal open flap
	n (%)	**n (%)**
Gender		
Male	7 (30.0)	7(30.0)
Female	13 (70.0)	13(70.0)
Age (Mean ± Sd)	42.5±5.75	45.0±7.75

Among the patients in treatment of root canal filling combined with root planning group1 we found that Bleeding on probing (BOP) after treatment 0.83±0.75 was statistical significance lower than before treatment 2.17±0.75 (95%CI 0.25 – 2.41, p-value=0.025). Besides that, Pocket depth (PD) after treatment 4.69±0.8 75 was statistical significance lowers than before treatment 6.14±1.51 (95%CI 0.46 - 1.42, p-value=0.0127). However, Clinical attachment level (CAL) after treatment 1.17±0.52 was statistical significance higher than before treatment 0.78±0.54 (95%CI of diff: 0.65 - 0.13, p-value=0.0126) (Table2).

Table2. Compared clinical index before and after treatment **Group1:** root canal filling combined with root planning

Clinical indicators (Group 1)	Before treatment	After treatment	Difference	**P-value**
	Mean ± SD	Mean ± SD	95%CI of diff	
Bleeding on probing (BOP)	2.17±0.75	0.83±0.75	0.25 to 2.41	0.0250*
Pocket depth (PD)	6.14±1.51	4.69±0.8	0.46 to 1.42	0.0127*
Clinical attachment level (CAL)	0.78±0.54	1.17±0.52	0.13 to 0.65	0.0126*

Paired t-test
***Significance level < 0.05**

In order to root canal filling combined with periodontal open flap treatment group2 we also found that Bleeding on probing (BOP) after treatment 0.33±0.52 was statistical significance lower than before treatment 2.33±0.82 (95%CI 1.07 - 2.44, p-value=0.0028). Pocket depth (PD) after treatment 3.64±1.02was also statistical significance lowers than before treatment 6.8±1.46 (95%CI 2.04 - 4.30, p-value=0.0008). However, Clinical attachment level (CAL) after treatment 1.41±0.46 was statistical significance higher than before treatment 0.97±0.61 (95%CI 0.82 - 0.051, p-value=0.0332) (Table3).

Table3. Compared clinical index before and after treatment **Group2:** Root canal filling combined with periodontal open flap

Clinical indicators (Group 2)	Before treatment	After treatment	Difference	**P-value**
	Mean ± SD	Mean ± SD	95%CI of diff	
Bleeding on probing (BOP)	2.33±0.82	0.33±0.52	1.07 - 2.44	0.0028**
Pocket depth (PD)	6.8±1.46	3.64±1.02	2.04 - 4.30	0.0008**
Clinical attachment level (CAL)	0.97±0.61	1.41±0.46	0.051 - 0.82	0.0332*

Paired t-test
***Significance level < 0.05**
****Significance level <0.01**

In case of compared clinical indicators after 90 days treatment between root canal filling combined with root planning and root canal filling combined with periodontal open flap, we found that all clinical indicators including Bleeding on probing (BOP), Pocket depth (PD) and Clinical attachment level (CAL) were not different (P-Values> 0.05) (Table 4).

Table4. Compared clinical index after treatment between root canal filling combined with root planning and root canal filling combined with periodontal open flap

Clinical indicators	After treatment (Group 1)	After treatment (Group 2)	Difference	**P-value**
	Mean ± SD	Mean ± SD	95%CI of	

			diff	
Bleeding on probing (BOP)	0.83±0.75	0.33±0.52	-0.33 - 1.33	0.209
Pocket depth (PD)	4.69±0.8	3.14±1.02	-0.84 - 2.25	0.0778
Clinical attachment level (CAL)	1.17±0.52	1.41±0.46	-0.86 - 0.39	0.4146

Unpaired t-test

Picture 1. Compared before and after treatment

Group1: Root planning and endodontic

Before treatment abscess

After treatment 90 day

Picture 2. Compared before and after treatment

Group2: Root canal filling combined with periodontal open flap

Case 1 treatment of periodontal open flap

Before treatment abscess

Calcium hydroxide Day: 1 and 15

Root canal filling 30 day

After treatment 90 day

case 2 :

After treatment 90 day

Discussion

The result of this study is following our hypothesis that after treatment 90 days both Two types of treatment root canal filling combined with root planning and root canal filling combined with periodontal open flap. the patient cleans the teeth better, Inflammation is reduced effectively, the reduction of pocket depth and gain in the clinical attachment level. Consistent with, reduction of bleeding on probing (BOP) and pocket depth (PD) was statistically significant (95%CI 0.25 mm – 2.41 mm, p-value=0.025) and (95%CI 0.46 mm - 1.42 mm, p-value=0.0127) respectively in treatment group 1 the same as treatment group 2 that, reduction of bleeding on probing (BOP) and pocket depth (PD) was also statistically significant (95%CI 1.07 mm –2.41 mm, p-value=0.0028) and (95%CI 2.04 mm – 4.30 mm, p-value=0.0008) respectively. Besides that, The Clinical attachment level (CAL) gain after treatment 90 days both two types group treatment (95%CI of diff: 0.65 - 0.13, p-value=0.0126), 61 (95%CI of diff: 0.82 - 0.051, p-value=0.0332) respectively, that corresponding to other study [9,11] that might be due to the surgery tool can be used to reach problem areas during surgery.

However, in 2017 The American Academy of Periodontology (AAP) reported that only the reduction of BOP and PD is not the only indicator in the treatment of periodontal disease because the cause of the disease depends on various factors such as Patient's disease, oral hygiene care of the patient, patient adherence, dentists capable, classification of diseases, position of diseases, characteristics of pocket deep, anatomical differences of each tooth and other factors that are difficult to study [12]. Therefore, the appropriateness of a good treatment plan will affect the success of any treatment method.

Due to this is the first study to compare two types of treatment methods. Therefore, the most crucial limitation of this study is lack of information for previous data. In addition, our study proceeding on COVID-19 crisis period that very difficult to follow up outcome from the patients. Nevertheless, this study has various advantage including the participates in our study do not have underlying disease both two group that appropriate for compared. Moreover, our result is present the first information for further study on periodontal treatment combine to endodontic treatment.

Conclusion

In conclusion, we compared the efficacy of periodontal treatment between root canal filling combined with root planning and root canal filling combined with periodontal open flap technique in the patients with perio-endo at the first day to ninetieth day that all clinical indicators including Bleeding on probing (BOP), Pocket depth (PD) and Clinical attachment level (CAL) were not different. It is suggested that for patients with the perio-endo (PD 4-9 mm) the dentist while considering on a treatment option should hence explain an integrated approach of taking proceed into consideration with patients and thereby providing each individual patient with the best possible option.

References

1. Wiebe CB, Putnins EE. The periodontal disease classification system of the American Academy of Periodontology-an update. Journal-canadian dental association. 2000;66(11):594-9
2. Kerns DG, Glickman GN. Endodontic and periodontal interrelationships. Pathways of the pulp, 9th Ed St Louis: Mosby Inc. 2006:650-67.
3. Tonetti MS. Cigarette smoking and periodontal diseases: etiology and management of disease. Annals of Periodontology. 1998;3(1):88-101.
4. Chaffee BW, Couch ET, Ryder MI. The tobacco- using periodontal patient: role of the dental practitioner in tobacco cessation and periodontal disease management. Periodontology 2000. 2016;71(1):52-64.
5. Serino G, Rosling B, Ramberg P, Socransky S, Lindhe J. Initial outcome and long- term effect of surgical and non- surgical treatment of advanced periodontal disease. Journal of clinical periodontology. 2001;28(10):910-6.
6. Heitz- Mayfield L, Trombelli L, Heitz F, Needleman I, Moles D. A systematic review of the effect of surgical debridement vs. non- surgical debridement for the treatment of chronic periodontitis. Journal of clinical periodontology. 2002;29:92-102.
7. Gu Y, Ryan ME. Overview of periodontal disease: causes, pathogenesis, and characteristics. Periodontal disease and overall health: a clinician's guide. 2010;5.
8. Chuckpaiwong S, Ngonephady S, Dharmbhibhit J, Kasetsuwan J, Sirirat M. The prevalence of periodontal disease and oral hygiene care in Savannakhet Province, Lao People's Democratic Republic. Southeast Asian J Trop Med Public Health. 2000;31(4):775- 9.
9. Choi YM, Lee JY, Choi J, Joo JY. Effect of root planing on the reduction of probing depth and the gain of clinical attachment depending on the mode of interproximal bone resorption. *J Periodontal Implant Sci*. 2015;45(5):184-189.

10. Abott P.V., Salgado J.C. Strategies for the endodontic management of concurrent endodontic and periodontal diseases. Aust Dent J. 2009;54:570–585.
11. Singh P. Endo-perio dilemma: a brief review. Dent Res J (Isfahan) 2011;8:39–47.
12. Mandelaris, G. A., Scheyer, E. T., Evans, M., Kim, D., McAllister, B., Nevins, M. L., Rios, H. F., & Sarment, D. (2017). American Academy of Periodontology Best Evidence Consensus Statement on Selected Oral Applications for Cone-Beam Computed Tomography. *Journal of periodontology*, *88*(10), 939–94