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 with a combined periodontal-endodontic lesion 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,

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. Inclusion criteria patient who reported pain and had periodontal disease sign, and awareness of treatment plan was sign consent form for treatment. Patient who reported for diabetes and systematic diseases was asked to have consult with medical doctor and sign for approved of treatment.

Patient with pulp infectious of soft tissue and also have problem with periodontal disease was enroll in the study, which divide into two group and two techniques of treatment according to how severe of periodontal diseases. Patient who came to Department of Periodontology was reported pain and have gum bleeding when brushing teeth. Patient was requiring to oral examination to evaluate pocket depth more than 4 mm, swelling gum and tooth mobility by using dental probe, Radiography shown the infection in root canal, this group of patient was in the group 1 patient also was test by Pulp vitality test, patient have sensitivity less. In group 2 patient was have more severe sign with pocket depth more than 6 mm, with Swelling and fistula or Suppuration and apex was shown infection this group have been plan treatment with open flap and endodontic.

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):

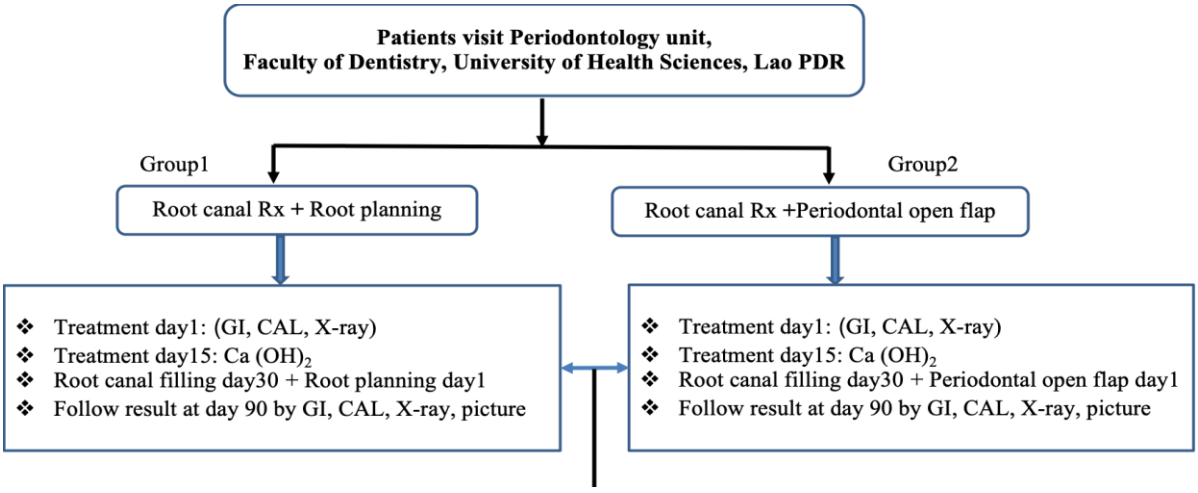
Amoxicillin 500 mg, 2 tablets times 3 per day during 7 days, Ibuprofen 400 mg, 1 tablet every 6 or 8 hours after meal during 5 days, Chlorhexidine gluconate 0.12 % rinse one a day during 2 weeks and also asked the patient to give oral health hygiene after that recall for checkup in 90 days and X-Ray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



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

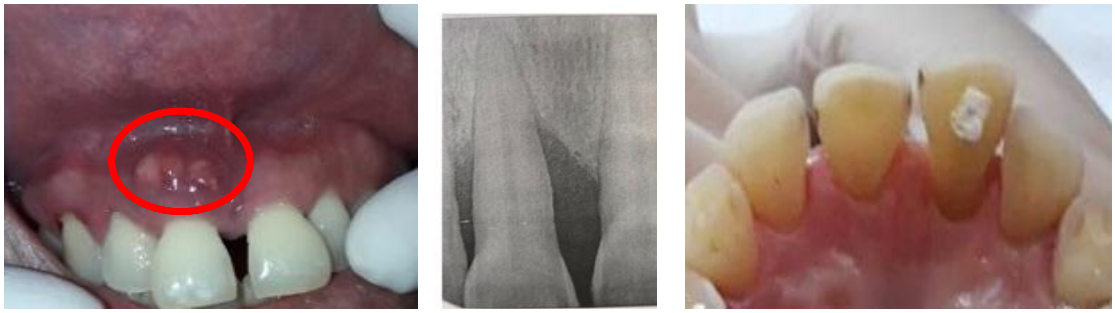
Clinical indicators	After treatment (Group 1)	After treatment (Group 2)	Difference	**P-value**
	Mean ± SD	Mean ± SD	95%CI of	

			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 Compared before and after treatment **Group1:** Root planning and endodontic

Before treatment abscess



After treatment 90 day

Picture 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 [12,13.14]. Therefore, the appropriateness of a good treatment plan will affect the success of any treatment method. True combined endodontic–periodontal disease occurs less frequently than other endodontic–period-ontal problems. It is formed when an endodontic disease progressing coronally joins with an infected periodontal pocket progressing apically [15,16].

The degree of attachment loss in this type of lesion is invariably large and the prognosis guarded

This is particularly true in single-rooted. Microbes can be transported easily in an apical direction, leading to the creation of periodontal and pulpal pathologic con-ditions[17]. Furthermore, lateral or accessory canals and exposed dentinal tubules along the groove are additional channels of bacterial invasion to the pulp [18]. Although mostly associated with deep periodontal pockets and alveolar bone loss, pulp necrosis occurs frequently, inducing combined periodontal-endodontic lesions

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.

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