College of Dental Medicine
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The effect of *Clinacanthus nutans* (Burm.F.) Lindau on gingival healing of extraction wounds

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ABSTRACT

The effect of Phayayor oral paste on the gingival healing of extraction wounds was investigated in this study.

The study and control groups were chosen by flipping a coin, and Phayayor oral paste was used in the study group. For reference, the wound socket was sutured and maintained in place. On days 0, 3, and 5, the examiner used a digital caliper to measure the distance of wound healing.

On days 3 and 5, the percentage of wound distance in the control group was 13.46±8,84 and 39.78±13.83, respectively, while the percentage of wound distance in the study group was 36.28±16.94 and margins 7.28. On days 3 and 5, the percentage of wound distance in the study group was substantially higher than in the control group. Theassessment of the distance of wound healing on day 0-3 is 1.80±0.82 and the distance of wound healing on day3-5 is 1.42±0.60 which mean difference is 0.37±1.34 The distance of wound healing in day 0-3 and day 3-5 is not statistically different at $p < 0.05$

Phayayor can accelerate wound healing in the first 5 days after the simple extraction.

OBJECTIVE

To evaluate the effect of *Clinacanthus nutans* (Burm.F .) Lindau on gingival healing of simple tooth extraction wounds and to compare the effect of *Clinacanthus nutans* (Burm.F .) Lindau on gingival healing of simple tooth extraction wounds on day 0, day 3, and day 5 .

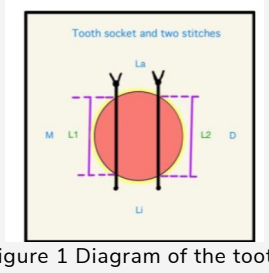

Figure 1 Diagram of the tooth socket and two stitches

Figure 2 L2 reference line

BACKGROUND

Nowadays, herbal medicine has been increasing as an alternative way, especially in developed countries because it is affordable and has fewer side effects in comparison with a synthetic compound. One of the herbs that are popular in Southeast Asia: Clinacanthus nutans (Burm.F.) Lindau (Phayayor) is used for treating oral ulcers or mucositis. This plant contains bioactive compounds including triterpenoids such as lupeol, flavonoids and purpurin-18 phytyl ester which perform an important role in wound healing in terms of anti-inflammation, promote cell migration and cell proliferation. Recently, Phayayor has been included in the Thai National List of Essential Medicines (2020) for treat herpes and varicella-zoster treatment, aphthous ulcers, skin rash, urticaria and insect bites.

The study of Muhammad Shahzad Aslam et al., 2016 found that flavonoids increase the antioxidant activity that surges the rate of wound contraction while purpurin-18 phytyl ester exhibits anti-inflammation, in-vitro wound healing, and anti-biofilm activity. Another study by Tanasomwong et al.,1986 found that the flavonoid compound showed anti-inflammatory action involved in the inhibition of prostaglandin synthesis. There is an experimental research study about the effect of Phayayor on gingival healing which is the study by Sirinthip et al., 2014. It is the study about the proliferative effect of Phayayorglycerine and Moringa oleifera seed oil extraction on cell proliferation. The study revealed that Phayayorglycerine promotes cell proliferation on human gingival fibroblast cell lines. Another study is the study by Srichan et al., 2015, which studied the effect of Phayayor on cell proliferation and cell migration in the human gingival fibroblast cell line. The study revealed Phayayor extracts promote cell proliferation and cell migration and it mentions that Phayayor extracts will affect for 5 days which is suggested as an alternate adjunctive regimen for oral wound healing. Most of the research about Phayayor is experimental research. Few clinical types of research show low evidential design strength of research design. There is clinical research by Putwatana et al., 2009 revealed that Glycerin Phayayor was effective, safe, and well-tolerated for prophylaxis and alleviation of radiation-induced oral mucositis. Until now, there is no clinical research study about the effect of Phayayor on tooth extraction wounds.

This study aims to evaluate the effect of Phayayor gingival healing on simple tooth extraction wounds.

MATERIAL & METHOD

This is a pilot study of randomized controlled clinical trials. 22 participants who required simple dental extraction in the Department of Oral Surgery, The College of Dental Medicine, Rangsit University were recruited in the study. Participants those who fulfilled the research criteria were provided written consent and proceeded in the study. They were randomly assigned into either control or study group using the flipping coin technique. One to two stitches of 4/0 black silk (Thysilk ®) were applied to each wound as the reference lines for the wound measurement. Participants were advised to bite gauze for 15 min for hemostasis. The wound distances were measured by using a dental and digital caliper. Acetaminophen 500 mg was given as needed for pain relief every 6 hr. All participants were recommended for similar wound care and instructions. In exception, those in the study group were additionally guided for an application of Phayayor oral paste (Herb & Hope ®) on the wound 4 times a day with provided checklist-time. On days 3 and 5 post-operation, healing of the wounds was monitored and wound distances were measured by a single researcher.

RESULTS & DISCUSSION

The study has compared the clinical wound healing of tooth extraction wounds between the control group and study group which was applying Phayayor oral paste for 5 days. According to the study of Srichan et al., 2015, Phayayor can stimulate wound healing significantly over 5 days. Therefore, in this study, we measure the size of wound length on day of extraction, day 3 as it exhibits rapid growth of proliferation, and day 5 which is the peak of the proliferation phase.
To evaluate which phase of wound healing that Phayayor has affected, we calculate the percentage changes of wound distance by using the Unpaired t-test.

Table 2 The comparison of the mean and standard deviations of the percentage changes of wound distance in the control group and the study group in the time series of intervention

The percentage changes of wound distance	Control	Study	P
Day 3	13.46±8.84	36.28±16.94	0.001*
Day 5	39.78±13.83	65.57±7.28	0.000*

*Statistic significant *(p<0.05)*

According to Table 2, the result revealed that the assessment of the percentage changes of wound distance in the control group on day 3 is 13.46±8.84 while the assessment in the study group is 36.28±16.94 and the percentage changes of wound distance on day 5 in the control group is 39.78±13.83 while the percentage changes of wound distance in the study group is 65.57±7.28. The result revealed that the percentage changes of wound distance between day 3 and day 5 are difference significantly which the percentage changes of wound distance in the study group tend to be more than in the control group (p-value at 0.05)

Table 3 The comparison of the mean and standard deviations of the distance of wound healing in the study group in the time series of intervention

Distance of wound healing	Mean	Std. Deviation	Mean difference	Std. Deviation difference	t	P
Day 0-3	1.80	0.82				
Day 3-5	1.42	0.60	0.37	1.34	0.87	0.40

The result revealed that the assessment of the distance of wound healing on day 0-3 is 1.80±0.82 and the distance of wound healing in day3-5 is 1.42±0.60 which mean difference is 0.37±1.34 The distance of wound healing in day 0-3 and day 3-5 is not statistically different at p<0.05