

Suppressing Gag Reflex with Low-Level Laser Therapy on Acupoint PC6: A Case Report

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ABSTRACT

Background: Gag reflex is a common problem in dental procedures such as pediatric patients, third molar extraction, periodontal surgery, taking radiography, oral examination, and alginate impression. Among different anti-gagging methods, laser acupuncture that use low-level laser therapy (LLLT) or photobiomodulation seems to be the newest and most practical method.

Case report: Here, we report pericard 6 (PC6) point laser acupuncture as a practical chairside method to suppress gagging in our patient just before scaling and root planning (SRP).

Results: Our case was a 33-year-old man who had sever gag reflex, and therefore, could not receive dental care in his whole life. His dentist scheduled to do scaling and surgically extract his third molar. We controlled the gag reflex successfully by stimulating PC6 point on his wrist with Diode LASER. SRP and extraction of third molar were done at the same session.

Conclusion: LLLT acupuncture is a preferred method due to less chair time, low invasiveness, and high safety compared to other methods. The acupoint P6 seems to be more practical than other anti-gagging points in dentistry as it is accessible when patient is on dental unit.

Keywords: Low-level laser therapy, Gagging, Acupuncture, Dentistry

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Introduction

Gagging is a reflex reaction of the body to prevent entry of foreign objects to the airway. Gag reflex, nausea, and vomiting are common problems for patients who undergo different medical and dental procedures. It can be stimulated by physical contact to the oropharynx or sometimes by specific taste, smell or touching a material (1).

Prevalence of gag reflex is about 8.2%, commonly in women, and inclines with increasing age, lower socioeconomic and educational state, and dental trait anxiety (2).

Dentists usually confront gag reflex while taking alginate impression or dental radiography, but in patients with severe gag reflex, even insertion of a dental mirror into the mouth during routine dental examination can induce gagging (1).

Various methods have been introduced to reduce the gag reflex including relaxation, distraction, and desensitization techniques; psychological and behavioral therapies; local anesthesia, conscious sedation, and general anesthesia techniques; and other complementary medicine therapies like hypnosis (3).

Also, acupressure and acupuncture are accepted as reliable methods in the reduction of gagging and nausea and vomiting. Acupuncture is a traditional East Asian medicine. It is defined as stimulation of special points in the body by insertion of a solid needle. Although, the efficacy of the use of needles is proven, this method is not widely used because there is a risk of cross-infection, contamination,

transcutaneous lesion, and it is difficult to use in children.

So, the new approach is the laser acupuncture that use low-level laser therapy (LLLT) or photobiomodulation instead of needle. There are three parasympathetic calming acupuncture points known to be effective in reducing gag and nausea, namely, Neiguan Pericardium 6 (PC6), large intestine point or He Gu point (LI4), and Conception Vessel 24 (CV24). Recent studies have shown that the PC6 point on the underside of the wrist, approximately 1 inch from the distal palmar crease, is a better point to control gagging, nausea and vomiting than the two other points (3). But in severe gagging and nausea, acupuncture on all three points in the wrist can be more effective (4). Stimulating these points activate mechanisms that inhibit the muscle activity of gag reflex (3).

This study reports a patient who had severe gag reflex that was successfully controlled with LLLT acupuncture on PC6 point.

Case Report

The patient was a 33-year-old, generally healthy man complaining of oral malodor who referred to dental clinic of mashhad medical university. Past medical and dental history was taken. He had no systemic diseases and did not use any drugs. In oral examination, we realized that he has significant supra and subgingival calculus and unerupted decayed mandibular third molars. He had no dental procedure done previously due to severe gagging (Figures 1 and 2).



Figure 1. Scaling and root planning at the same appointment.



Figure 2. Patient's OPG radiography.

For controlling gag reflex, LLLT acupuncture was performed on P6 point on the right hand of the patient by Diode LASER (Doctor Smile, Italy) with power output of 0.3 W, wavelength of 980 nm, and dose of 15.62

j/cm^2 for 20 seconds. Low level laser therapy was performed in a defocused continuous mode with a spot size of 7 mm, keeping the tip of Diode LASER in contact to the skin of the wrist (Figure 3).



Figure 3. Low-level LASER therapy on PC6 acupoint.

The patient was asked whether he had any problem during and after the procedure. No adverse effect was reported by him.

The SRP and right mandibular third molar extraction was successfully done for the patient at the same session. The patient was scheduled to have another session of LLLT on p6 point before surgery to extract mandibular left third molar.

Severe gag reflex impedes almost all dental procedures and makes general anesthesia mandatory for patients who have oral and dental problems. Almost all of these patients have poor oral hygiene, diffuse dental caries, halitosis and calculus formation because of inappropriate brushing and flossing of teeth, and avoiding annual dental visits. Different studies demonstrate that gag reflex occurs during taking radiography or restoration of posterior teeth, primary intraoral examination in orthodontic patients.

Recently, needle acupuncture and LASER acupuncture have been suggested as a practical option to control chronic pain and gag reflex via its analgesic effect. Acupuncture stimulates afferent nerves, and subsequently, various substances such as enkephalin and dynorphin that are secreted in the spinal cord and relieve pain and muscle contraction centrally, which is called "gating effect". Also, possibly acupuncture suppresses gag reflex by inducing the release of beta-endorphin in cerebrospinal fluid, or by changes in serotonin transmission (3).

Various comparative studies demonstrated that LASER acupuncture is as effective as needle acupuncture for patients with severe gag reflex, making it suitable for children and adults who fear from needles used for acupuncture (5). Also, needles of traditional acupuncture may cause tissue injuries such as hematoma, pain and vegetative symptoms or cross-infection (HIV or HBV), which is not possible in LASER acupuncture (6).

Different points having anti-gag effect with different protocols of LLLT are used in the studies, making it difficult to have a comparison. So, we focused on the LLLT studies on point P6. Goel *et al.* (2017) have used Diode laser (0.5 mw, 940 nm, 4 j/cm², 3-4 mm away from skin) and reported effective suppression of gag reflex in children while taking impression (3). Elbay *et al.* (2016) also used Diode LASER (300 mw, 810

nm, 4 j/cm², 1 cm away from skin) and found it effective in gag reflex control in children while taking dental radiography. They also found no correlation between stress level and gagging severity in children, which is consistent with the results of some other studies (1). Albooghobeish *et al.* (2019) found LLLT ineffective to control vomiting after strabismus surgery using L3728 Pointer Pulse II Dual Probe Laser & T.E.N.S (<5 mw, 650 nm, 60 seconds, distance from skin not mentioned) 15 minutes before general anesthesia and 15 minutes after surgery (7). Butkovic *et al.* (2005) found Diode LASER acupuncture (20 mW, 780 nm, 0.1–1 J/cm², 60 seconds, distance from skin not mentioned) 15 min before surgery, applied to P6 point after surgery as effective as Metoclopramide in reducing post-operative nausea and vomiting in children (8). Kotlow *et al.* (2009) suggests applying laser energy using 4 Joules of the MedX (either the 633 or 880-nm wavelengths) held in contact, perpendicular to the tissue on the P6 point to eliminate gag reflex (9). Although, there are different protocols of LLLT on PC6, the overall results about gag reflex control, show that it is at least as effective as drug therapy in patients. But more cases should be reported, as in our study, a limited number of the cases was reported. Moreover, newly, it is proposed that adequate treatment of pain, especially neuropathic pain and cancer pain, that remains an unmet medical need due to the significant adverse effects of current analgesics, can be done by the PC6 stimulation, because it has a non-opioid analgesic mechanism (10). So, PC6 point LLLT needs to be investigated in different fields of dentistry. It may also be effective in postherpetic neuralgia, chronic pain syndromes of the head and neck, and pain relief after radiotherapy of the head and neck malignancies.

Conclusion

LASER acupuncture point P6 seems to be an effective method for controlling gag reflex during dental procedure, this point is an easy-to-access and less sensitive technique and has no interference with orofacial region to restrict the field of work for dentists. But LASER acupuncture need training of the operator, and also, adequate equipment. Future case series and clinical trials are necessary to identify the best anti-gagging response.

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