Photodiagnosis and Photodynamic Therapy 26 (2019) 134–136

Contents lists available at ScienceDirect

Photodiagnosis and Photodynamic Therapy

journal homepage: www.elsevier.com/locate/pdpdt

Successful treatment of oral human papilloma by local injection 5-aminolevulinic acid-mediated photodynamic therapy: A case report

Jianqiu Jin*, Yuxing Zhang, Zhiyue Lu

Department of Stomatology, Beijing Hospital, National Center of Gerontology, P.R. China

ARTICLE INFO

Keywords:
Papilloma
Photodynamic therapy
Aminolevulinic acid

ABSTRACT

Oral human papilloma (HPV) virus is very common in patients. Deep location of lesions can lead to poor therapeutic effects. We are reporting a case of 52-year-old male who was diagnosed of oral papilloma on the left side of the palatoglossal arch. He was treated with local injection of 5-aminolevulinic acid-mediated photodynamic therapy for 2 sessions. There was no obvious recurrence at 6 months of follow-up. This case suggests that sodium chloride injection diluted ALA photosensitizer and injection at lesion basement can achieve good therapeutic results.

1. Introduction

Oral human papillomavirus infection is now recognized to play a role in the pathogenesis of head and neck squamous cell carcinomas [1,2]. Early treatment of HPV is necessary and local excision is desirable [3]. Photodynamic treatment (PDT) of oral HPV was first introduced in the mid 1980s [4]. As a selective method of killing proliferative active cells, it has been widely used in the treatment of various parts of the body. Photodynamic therapy with aminolevulinic acid (ALA-PDT) is a combination of drugs and instruments, which can be used to treat urethral condyloma acuminatum (CA) and genital CA [5].

2. Case report

A 52-year-old male presented with mucosal hyperplasia on the left side of the palatoglossal arch which has been there for 6 months (Fig. 1). The initial lesion has increased to the size of a soybean. The lesion was asymptomatic. The patient went to the otorhinolaryngology department. The lesion was diagnosed as "papilloma" and recommended to be resected. Clinical examination showed that papillary hyperplasia of 1 cm × 1 cm by diameter on the left side of the palatoglossal arch. There was no exudation found in the surrounding mucosa. The patient refused surgical resect but agreed on ALA-PDT, after consultation with doctors about the side effects and consent with other treatment alternatives. Initially, 10% ALA cream (Shanghai Fudan Zhangjiang Bio-pharmaceutical Co. Ltd, Shanghai, China) was prepared as fresh hydrogel. At first, a piece of medical absorbent cotton which contains the hydrogel described before was applied to the lesion. The cotton sheet has excellent absorption feature, and was covered with plastic wrapping. The patient had a 30-year history of smoking, and the lesion was located in the posterior part of the mouth where saliva secreted constantly, the cotton sheet could not be fixed well covering the lesion. We tried applying cotton dressing ALA on the patient in the case, but failed to obtain the cooperation from the patient. Therefore, a new method had to be carried out. With the consent of the patient and family, we tried using injection of ALA, subepithelial injection was performed after ALA was administered with sodium chloride.

About half of the 118 mg of ALA was dissolved by adding 0.5 ml sodium chloride injection. Intralesional injections were performed using a 1-cc syringe and a 25-gauge needle. The lesion was irradiated with 100 J/cm2 630 nm red light at 300 mW/cm2 for 6 min. Before irradiation, articaine was injected intradermal to relieve pain. The patient received 1 session of ALA-PDT at one-week interval. After 2 sessions of ALA-PDT, the papilloma gradually diminished and eventually disappeared. At 6-months follow up, it appeared that there was some hyperplasia at the original lesion, but the patient did not feel abnormal when eating or swallowing, and there was no willingness to take further therapy. After deliberation with the patient, it was decided to reconfirm whether further treatment is needed when reviewing after three months.

* Corresponding author at: Department of Stomatology, Beijing Hospital, National Center of Gerontology, 1 dahua Road, Dongcheng District, Beijing, 100730, P.R. China.

E-mail address: jianqiu_82@126.com (J. Jin).

https://doi.org/10.1016/j.pdpdt.2019.03.011
Received 12 January 2019; Received in revised form 5 February 2019; Accepted 13 March 2019
Available online 16 March 2019

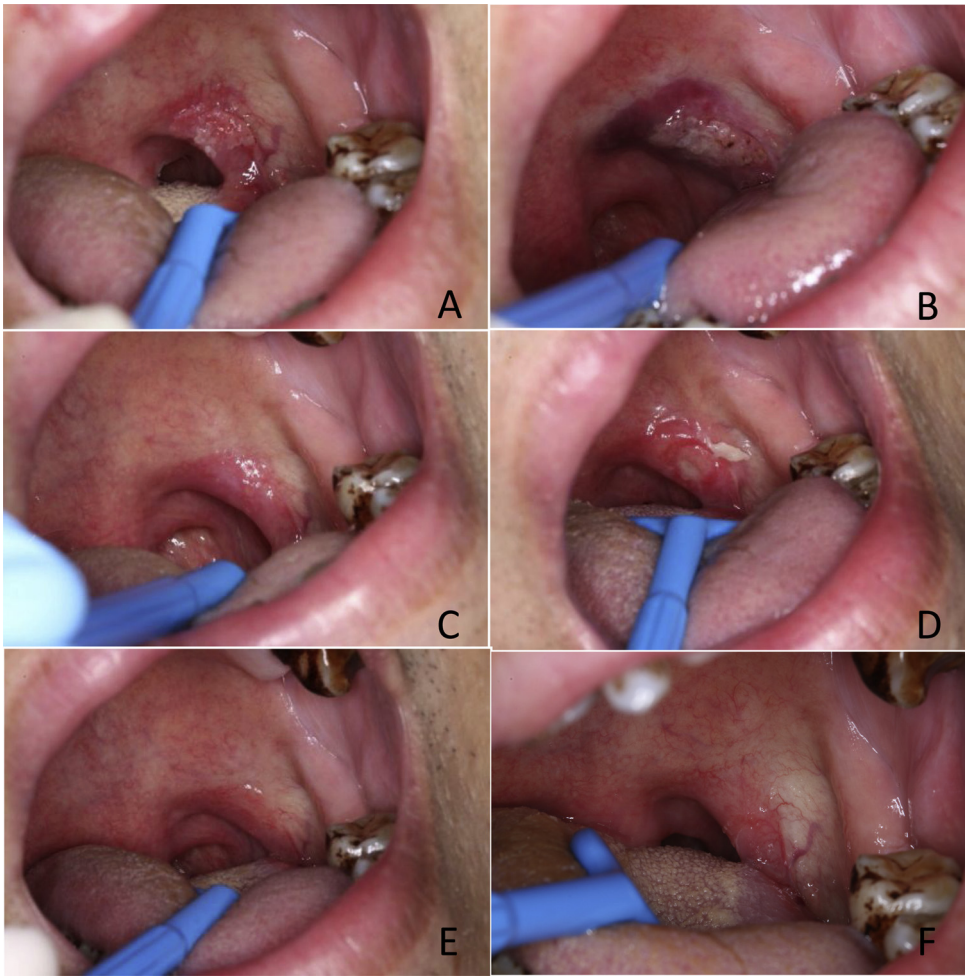

Fig. 1. Clinical images: (A) initial state; (B) before treatment; (C) 1 week post the first session of ALA-PDT; (D) 1 week post the second session of ALA-PDT; (E) 1 month post the second session of ALA-PDT; (F) 6 months post the second session.

3. Discussion

Photodynamic therapy has obvious effects on oral verrucous hyperplasia without scar and tissue defect, which has the same effects for skin condyloma acuminatum. With topical application of ALA for 1.5–2 h, Lin et al. used ALA-PDT to treat 40 patients with verrucous hyperplasia and leukoplakia caused by chewing areca nut, and achieved good therapeutic effects [6]. 13 patients with 24 oral leukoplakia (OL) lesions and 8 with 20 oral lichen planus (OLP) lesions were treated by Maloth KN et al. 50 mg of 5-ALA powder was mixed with 1 ml water, yielding a clear colourless solution. This solution applied topically on the lesions, 30 min prior to exposition with the LED at a wavelength of 420 nm (blue-light) [7].

This case was different from the previous treatment of leukoplakia, erythema, skin condyloma acuminatum. Instead of using wet application of ALA photosensitizer, sodium chloride injection was used to dilute ALA photosensitizer, injection at the lesion basement, and then followed by immediate photodynamic irradiation. After 2 sessions of ALA-PDT, the lesion disappeared and the therapeutic effect was satisfactory by visual observation. This case illustrated the photodynamic therapy after ALA injection was effective for such lesions and is superior to the suggestion of surgical resection. Injection of photosensitizers can quickly distribute photosensitizers in the target area, save hours of wet application of photosensitizers, shorten the course of treatment, and bring more comfort to patients. Afterwards, we tried a few cases and found that the effect was better if we waited a while to illuminate after the injection. The discovery will be explained in future articles.

Most studies are based on clinical observations to determine the efficacy. Sulewska M et al. took photodynamic therapy in the treatment of erosive oral lichen planus. The healing continued and further reduction in size took place during the 12-month observation [8]. ALA-PDT was used in treating condylomata acuminate. The overall complete remission rate of 1–4 sessions of treatments was 98.2%. Patients were followed up for 6–24 months and recurrence rate was 3.6% [9]. Clinically, the most appropriate "individualized" treatment method can be selected according to the specific conditions of each patient.

The limitation of diagnosis and treatment of this case was that no histopathological examination results were obtained. Photodynamic therapy is destructive to the tissues. Pathological examination is still the best way of distinguishing the benign from malignant tissues. However, if we can combine autofluorescence, toluidine blue staining and exfoliated cell DNA detection at early stage, it will increase the diagnosis accuracy in the absence of pathological examination.

Conflict of interest

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

Acknowledgements

Our study received approval from the ethics committee of Beijing Hospital. The patient and family members also provided written informed consent to publish the case report details.

References

[1] C. Fakhry, M.L. Gillison, Clinical implications of human papillomavirus in head and neck cancers, J. Clin. Oncol. 24 (17) (2006) 2606–2611.

[2] J. Mork, A.K. Lie, E. Glattre, et al., Human papillomavirus infection as a risk factor for squamous-cell carcinoma of the head and neck, N. Engl. J. Med. 344 (15) (2001) 1125–1131.

[3] Michael Glick, Burket's Oral Medicine, 12th ed., People's Medical Publishing House-USA, 2015, p. 156.

[4] S.I. Kvaal, T. Warloe, Photodynamic treatment of oral lesions, J. Environ. Pathol. Toxicol. Oncol. 26 (2) (2007) 127–133.

[5] X.L. Wang, H.W. Wang, Wang HSc, et al., Topical 5-aminolaevulinic acid-photodynamic therapy for the treatment of urethral condylomata acuminata, Br. J. Dermatol. 151 (4) (2004) 880–885.

[6] H.P. Lin, H.M. Chen, C.H. Yu, et al., Topical photodynamic therapy is very effective for oral verrucous hyperplasia and oral erythroleukoplakia, J. Oral Pathol. Med. 39 (8) (2010) 624–630.

[7] K.N. Maloth, N. Velpula, S. Kodangal, et al., Photodynamic therapy a non-invasive treatment modality for precancerous lesions, J. Lasers Med. Sci. 7 (1) (2016) 30–36.

[8] M. Sulewska, E. Duraj, S. Sobaniec, et al., A clinical evaluation of the efficacy of photodynamic therapy in the treatment of erosive oral lichen planus: a case series, Photodiagnosis Photodyn. Ther. 18 (2017) 12–19.

[9] H.W. Wang, L.L. Zhang, F. Miao, et al., Treatment of HPV infection-associated cervical condylomata acuminata with 5-aminolevulinic acid-mediated photodynamic therapy, Photochem. Photobiol. 88 (3) (2012) 565–569.