

Nd:YAG and Er:YAG Laser Application to Remove Oral Lesions of Lipoid Proteinosis

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Abstract: Lipoid proteinosis is a rare syndrome with autosomal recessive inheritance. This disease is characterized by diffuse deposition of hyaline substance in the dermis, the submucosal connective tissue and various internal organs. The patient chosen for the case study was a 21-year-old female. After biopsy with a scalpel, bleeding was seen in some areas and suturing was very difficult. Nd:YAG and Er:YAG laser were used for biopsy of the oral lesion, and after laser treatment, there was only slight bleeding, eliminating the need for suturing. The healing process after treatment proceeded unremarkably. As suturing is difficult in these patients and mucosa is rigid, the use of lasers offers some advantages for biopsy and reshaping of oral lesions in this syndrome.

Keywords: Nd:YAG, Er:YAG, laser, lipoid proteinosis, biopsy, syndrome.

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Lipoid proteinosis, also known as Hyalinosis cutis et mucosae (OMIM 247100) was first described by Urbach and Wiethe in 1929.¹ Since then, over 250 cases of this autosomal recessive disorder have been described.² It is characterized by the deposition of an amorphous hyaline substance (glycoprotein) in the mucous membranes and skin.³ Hoarseness and thickening of vocal cords are the most characteristic symptoms present from infancy or early childhood.^{3,4} Another classic and most easily recognizable sign are the beaded eyelid papules.⁵ Other cutaneous changes may include waxy, yellow papules and nodules with generalized skin thickening.² The mucosa of the pharynx, tongue, soft palate, tonsils and lips is also infiltrated.^{6,7} Other features may include epilepsy and calcification in the temporal lobes or hippocampi.⁸ Suturing after removal of these lesions was difficult, so we used laser for biopsy of the oral lesions.

CASE REPORT

The patient was a 21-year-old female from Shahrekord who sought medical advice at the Oral Medicine department of the Dental School at Isfahan University of Medical Sciences in 2003. The patient was completely edentulous and showed the classic signs of lipoid proteinosis (Figs 1 to 3). In oral examination, the oral mucosa was rigid, and the labial mucosa had become nodular and thickened. Her tongue was rigid and severely restricted in movement (Fig 1). She had 6 sisters and one brother, and while two of her sisters (22 and 8 years old) suffered from the same syndrome, other members of her family showed no signs of this disease. A complete blood analysis and routine urinalysis were all within normal limits. Lateral cephalometric radiography of the skull revealed calcifications in the suprasellar region.

CASE REPORT



Fig 1 Involvement of lip and tongue in the patient with lipid proteinosis.



Fig 2 Eyelid papules in this case of lipid proteinosis.



Fig 3 Skin lesions in this case of lipid proteinosis.

The biopsy of lip lesions was performed with a scalpel and examined by a pathologist to confirm the diagnosis. Suturing after biopsy was difficult because the mucosa was rigid, and the sutures cut into it. Without applying any local anesthesia, Er:YAG and Nd:YAG lasers (Fidelis plus, Fotona; Ljubljana, Slovenia) were used to take the biopsy from the lower lip. With the Nd:YAG, incision was slow (Fig 4), so the Er:YAG laser (Fidelis plus, Fotona; RO7, SP, 200 mJ, 20 HZ) was used. With this laser, it was possible to cut quickly and reduce the bleeding to a minimum. With laser usage, there was no need for suturing (Fig 5). The removed lesion was sent to an oral pathologist. Histopathological examination revealed the deposition of a homogeneous hyaline substance in the connective tissue (Fig 6). The healing process after biopsy was painless and proceeded uneventfully (Fig 7).

The patient asked for laser treatment to reshape her lips. Er:YAG laser (RO2, SP, 300 mJ, 15 HZ) was used with local anesthesia to reshape the lower lip in the course of two sessions, and a part of the upper lip in one session. Ibuprofen 400 mg (qid) was prescribed. Healing was satisfactory after one month. Up to the present, no new nodules have formed on her lips. The lips are softer than before treatment and the appearance has improved.

DISCUSSION

Lipoid proteinosis is a rare autosomal recessive disorder accompanied by hoarseness as well as infiltration and thickening of the skin and certain mucous membranes. Recently, lipoid proteinosis was mapped to

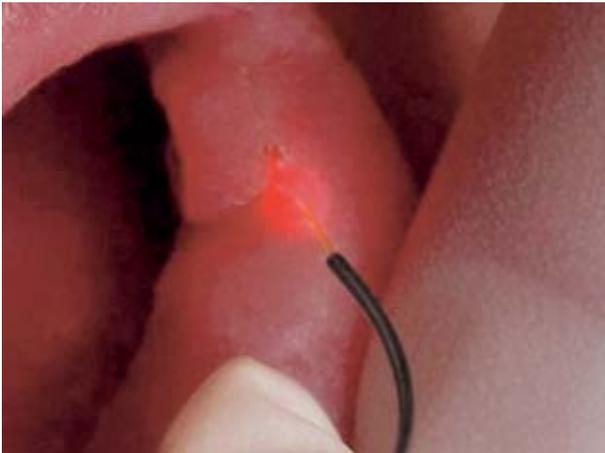


Fig 4 Nd:YAG laser usage for biopsy of lip.



Fig 5 Biopsy area immediately after laser treatment.

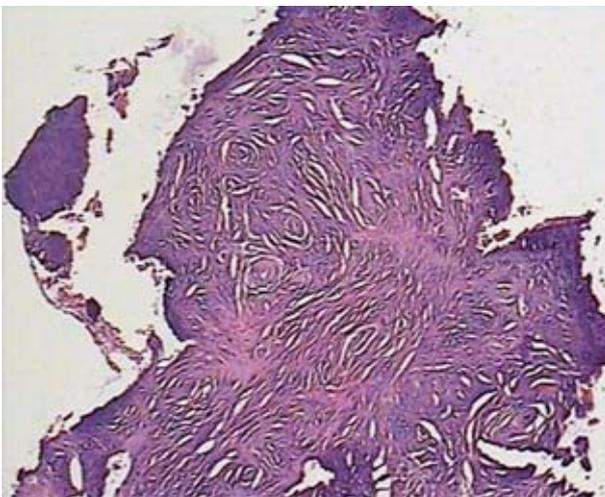


Fig 6 Haematoxylin/eosin staining, magnification 100X, showing hyaline substance in the connective tissue.



Fig 7 Healing three days after laser treatment.

1q21, and pathogenetic loss of functional mutations were identified in the extracellular matrix protein 1 gene (ECM1).^{2,4} Some treatments for this disorder have already been reported. A case of lipoid proteinosis was successfully treated with dimethyl sulfoxide,⁹ but in three cases it showed no beneficial effect.¹⁰ Retinoids have shown encouraging results in cutaneous lesions in a preliminary study.^{11,12} D-Penicillamine had a favorable effect in a patient with this syndrome.¹³ Microlaryngoscopy and dissection of the vocal cords, dermal abrasion, chemical skin peeling, and blepharoplasty have been performed in some cases.^{14,15}

Lasers are used in many fields of medicine and dentistry. Carbon dioxide laser surgery of thickened vocal

cords and beaded eyelid papules has proved to be helpful in some studies.^{2,16} The Er:YAG laser has an emission wavelength of 2940 nm, which coincides with the main absorption peak of water. The Nd:YAG laser has a wavelength of 1064 nm. It has a particular affinity for melanin or other dark pigments.^{17,18}

According to our knowledge, this is the first report of the Er:YAG and Nd:YAG laser being used for biopsy and removal of oral lesions in this rare syndrome. Oral tissue in this syndrome is rigid, which makes suturing after surgery difficult. When using the Er:YAG laser in this case, it was possible to obtain a good biopsy specimen, very similar to specimens obtained with a scalpel. The Er:YAG laser seemed to be more suitable than the

Nd:YAG laser for removing lip lesions accompanying this syndrome, because incision with the Er:YAG laser was faster, and there was no need for using the Nd:YAG for bleeding control. Apparently, laser treatment has many advantages when trying to improve the esthetic appearance and the emotional state of patients with this syndrome.

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