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### RESEARCH ARTICLE

#### DIODE LASER AIDED EXCISION OF PYOGENIC GRANULOMA ON TONGUE: A CASE REPORT

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#### Abstract

Pyogenic granuloma, also called lobular capillary hemangioma, is a non-neoplastic, vascular reactive lesion of the skin and mucous membranes. While the majority of the oral pyogenic granuloma involve the gingiva, they also rarely present at other sites including lips, buccal mucosa, palate, and tongue. The most common treatment of pyogenic granuloma is surgical excision but alternative modern approaches such as laser excision have also been proposed which results in bloodless, painless and suture free procedure. Herein, we present a case of pyogenic granuloma on tongue which was excised successfully with diode laser as a conservative and non-stressful method. The use of laser as modern medicine offers a new tool for treatment of oral lesions as comfortable as possible in all patients.

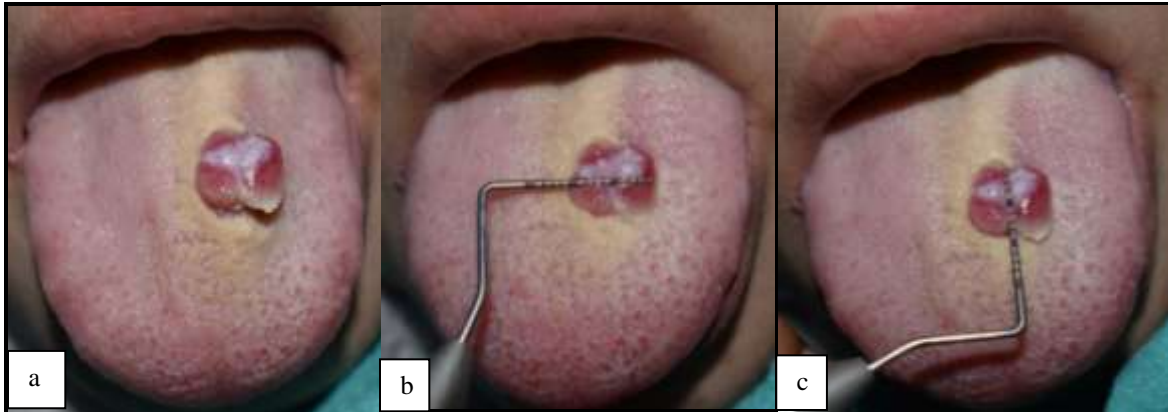
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#### Introduction:-

Pyogenic Granuloma is a common benign tumor-like reactive lesion of the oral cavity. It was first originally termed botryomycosis hominis by Poncet and Dor in the year 1897<sup>1</sup>. Later, in 1904, Crocker and Hartzell<sup>2</sup> termed it as 'Pyogenic Granuloma'. But this term is a misnomer as the lesion is neither due to bacterial infection nor produces pus formation clinically and granulation tissue formation histologically<sup>3</sup>. The peak incidence of this lesion occurred during the 2nd and 5th decades of life. It is mostly present in the female population, especially during pregnancy hence also named a 'Pregnancy Tumor'. Gingiva is the most common site involved followed by lips, buccal mucosa, palate, tongue, and floor of the mouth<sup>4</sup>. Taking functional and aesthetic factors into consideration laser therapy plays an intense effect in the treatment of such intraoral soft-tissue growth. This article reports a case of pyogenic granuloma in an unusual site and a detailed review of the advantages of laser therapy in such cases.

#### Case Report

A 21-year-old young female reported to our department with the chief complaint of painless tissue mass on her dorsal surface of the tongue for the past 1 month. The patient noticed mass growth in the ninth month of her pregnancy. There was a rapid increase in the size of the lesion initially, but after parturition, it started decreasing and attained the present size. There was also a history of bleeding from the mass during the initial period. The patient's medical history, family history, and personal history were insignificant. Extraoral examination showed no abnormality. Intraoral examination revealed a solitary, exophytic, pedunculated oval-shaped tissue growth of size approximately 1 x 1cm on the midline of the anterior one-third of the dorsal surface of the tongue. The exophytic growth appeared grayish-white at the center surrounded by an erythematous zone at the periphery with a lobulated surface (**Figure 1**). The mass was afebrile, painless, soft to firm in consistency, and non-pulsatile. The regional lymph nodes weren't palpable. Depending on the history and clinical examination, a provisional diagnosis of Benign exophytic growth on the dorsal surface of the tongue was considered. Pyogenic granuloma, Traumatic fibroma, and Hemangioma were considered as the differential diagnosis.



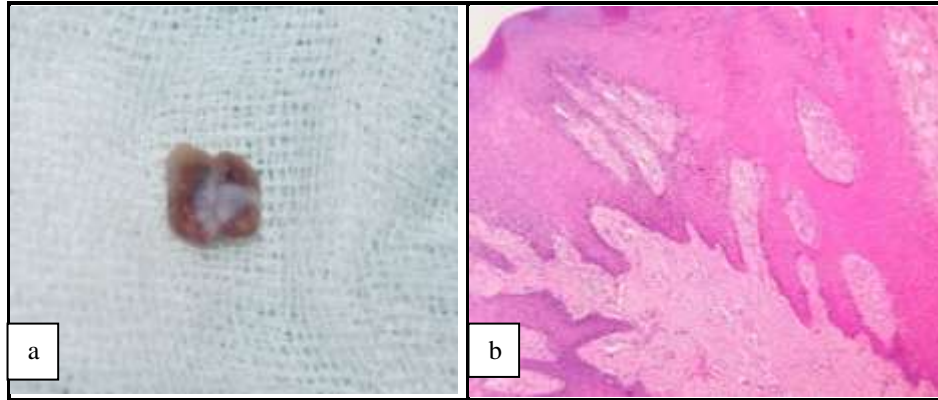
**Figure 1 (a,b,c):-** Intraoral photograph showing solitary, pedunculated, oval-shaped tissue mass of size 1x1cm (approx.) with central pale area surrounded by peripheral erythematous zone

For the comfort of the patient, field block was given and the lesion was secured by passing 3-0 silk suture over the base of the lesion. After that, the lesion was completely excised by soft tissue diode laser (CLEAN CUT Laser by Confident Dental Equipment Pvt. Ltd, India) by keeping it at 980nm wavelength, 200  $\mu$ m fiber, and 3W power in continuous mode (**Figure 2 and 3**). It took 2-3 mins to completely excise the mass. The diode laser itself provided the ideal combination of spotless cutting and hemostasis, thus there was no need to suture the surgical site.



**Figure 2:-** a) The tissue mass was secured by 3-0 silk suture by passing through the base of the lesion, b) The mass was completely excised by diode laser, c) Immediate post-operative photograph

The patient was discharged immediately with all necessary post-operative instructions and was not prescribed any antibiotics or analgesics. The patient was advised to maintain oral hygiene and was recalled after one week for follow-up. The excised tissue mass was sent for histopathologic evaluation which showed para-keratinized stratified squamous epithelium with varying degrees of proliferation, atrophy at places, and arcading pattern. Underlying connective tissue showed numerous blood vessels of varying size, arranged in lobular patterns separated by fibrous septa. Blood vessels showed a prominent and plump endothelial lining. Moderate to severe degree of chronic inflammatory cell infiltrate was evident. Focal areas of hemorrhage were observed. Overall features, suggestive of "Pyogenic Granuloma" (**Figure 3**)



**Figure 3:-** a) Excised biopsy specimen, b) histopathological examination revealed para-keratinized stratified squamous epithelium with numerous blood vessels of varying size, arranged in lobular patterns separated by fibrous septa

After one week of follow-up, the healing was completely satisfied with no post-operative pain and discomfort. No evidence of recurrence was reported even after one year of follow-up.



**Figure 4:-** One week follow-up.

### Discussion:-

In the year 1844, Hullihen<sup>5</sup> first defined pyogenic granuloma in the English literature. Later, Crocker and Hartzell termed it as pyogenic granuloma or granuloma pyogenicum. It was also called as Crocker and Hartzell's disease. Histologically, Angelopoulos<sup>6</sup> defined it as hemangiomatous granuloma due to presence of more blood vessels and inflammatory nature of the lesion. It is a reactive lesion of oral cavity and accounts for 26 to 32% of all reactive lesions. The lesion was thought to be formed as a result of exaggerated localized tissue reaction due to chronic irritations like poor oral hygiene, non-specific infection, overhanging restoration, exfoliated primary tooth, bony spicules, previous dental extractions, tooth brush trauma, root remnants etc. It was also thought to be formed due to hormonal effects on vascular type of connective tissue since it predominantly presented in young females during the time of pregnancy<sup>7</sup>. Certain immunosuppressive drugs and oral contraceptives also play a role in the etiopathogenesis. In the present case, the lesion appeared during the last trimester of pregnancy in a young female patient.

Clinically, the lesion has site preference for the gingiva (75%) especially, the marginal gingiva and the interdental papilla and on rare occasion it can be found extra-gingivally in the areas of frequent trauma such as lower lip, palate, buccal mucosa and tongue<sup>8</sup>. In the present case, it arised extra-gingivally from the dorsum of anterior two third of the tongue along the midline.

The histological picture of pyogenic granuloma consists of atrophic/hyperplastic epithelium with characteristic features of numerous endothelium-lined vascular spaces and proliferation of fibroblasts and budding endothelial cells. Presence of mixed inflammatory cell infiltration was also detected. Depending on the rate of proliferation and vascularity, Cawson et al<sup>9</sup> have described two variants of pyogenic granuloma histologically, namely, lobular capillary hemangioma (LCH) and non-lobular capillary hemangioma. The LCH type of pyogenic granuloma was characterized by proliferating blood vessels organized in lobular aggregates whereas the nonLCH type showed high vascular proliferation resembling granulation tissue. The present case was a lobular capillary hemangioma type.

Although the conventional treatment was surgical excision, a recurrence rate of 16% has been reported. In present days, Laser therapy carry the advantage of less invasive and suture-less procedures that produce only minimal postoperative pain. It eliminates the use of post-surgical dressing and improved hemostasis and coagulation. It also depolarizes nerves, thus reducing post-operative pain and also destroys many bacterial and viral colonies that may potentially cause infection<sup>10</sup>. Laser transmits energy to the cells causing warming, welding, coagulation, protein denaturation, drying, vaporization and carbonization. The disadvantages were delayed repair in larger lesions and charring tissue in smaller lesions compared to the application of conventional scalpel surgical procedures and laser plume in excision of exophytic lesions produced by human papilloma virus and may be creates similar lesions in upper respiratory tract of laser operator<sup>11</sup> but White et al<sup>12</sup> proposed that laser excision was well tolerated by patients with no adverse effects. It shows excellent results with minimal pigmentary and textural complications. There was less scarring due to the minimal degree of wound contraction following laser irradiation which occurs through induction and formation of smaller number of myofibroblasts and collagen<sup>13,14</sup>. In the present case, patient had no post-operative discomfort and scarring.

### Conclusion:-

Excisional surgery was the preferred method of treatment for pyogenic granuloma. The application of lasers in dentistry creates a new path for transforming traditionally existing treatment modalities or serve to compliment them. In terms of technology, patient's acceptance and post-operative management, these kinds of modern medicine techniques need to explore and take advantages to derive maximum benefits.

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