

CASE REPORT

Non-invasive treatment of pyogenic granuloma by using Nd:YAG laser

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SUMMARY

Pyogenic granuloma is a 'reactive lesion' in the oral cavity caused due to hormonal imbalance or poor oral hygiene. There are different methods to excise this lesion but most successful is treatment with lasers. Currently, there are different lasers available commercially and are used by clinicians to excise this lesion. In this case report, a 20-year-old female patient reported to the department with a complaint of overgrowth of gingiva on lower canine. It was excised by using neodymium-doped yttrium aluminium garnet laser and the patient was asked for regular follow-up after 1 week and 6 months. The excised lesion was sent to pathology where the lesion was confirmed to be pyogenic granuloma. The patient reported no pain, no blood loss during or postsurgery. Laser is a useful technique for excisional surgeries; it is safe, effective and reduces time of treatment as well as time of healing.

BACKGROUND

Poncet and Dor,¹ two French surgeons, originally explained pyogenic granuloma and termed it as botryomycosis hominis.¹ Although in 1844, Hullihen² described about this lesion, he did not term it. In 1903, Crocker³ coined the term granuloma pyogenicum. But in the literature, some researchers mentioned the name of Hartzell^{4, 4} who coined the term pyogenic granuloma. Pyogenic granuloma is not a correct definition as it is not a true granuloma and it does not contain pus. It is a benign, mucocutaneous lesion commonly evolves on tongue, gum, lips⁵ and some extraoral sites like face, nose, eyelids, neck,⁶ etc. As pyogenic granuloma is non-neoplastic in nature, excisional treatment is the better option. Excision can be done by using laser because the cutting is clean and almost no blood loss and also be painless. The lasers that can be used for the excision treatment are neodymium-doped yttrium aluminium garnet (Nd:YAG) laser, diode lasers, erbium-doped YAG (Er:YAG) laser, flash lamp pulsed dye laser.⁷ In this case report, Nd:YAG laser is used to excise the lesion without any blood loss.

CASE PRESENTATION

A 20-year-old female patient reported to the outpatient department of conservative dentistry and endodontics, King George's Medical University, with a complaint of growth of gingiva in the lower canine gingival region (figure 1) since 4 months and was increasing in size. The lesion was firm, soft

and similar to the colour of gingiva. The lesion was measured around 1.0×0.8 cm. She also complained of bleeding in lesion while brushing. It was a painless lesion but was growing, which raised an alarm for the patient. There was no relevant medical history of the patient.

INVESTIGATIONS

1. Extraoral evaluation: nothing anomalous found.
2. Intraoral evaluation: an odd distinct gingival growth was observed on the mandibular canine region of about 1.0×0.8 cm in size. The shape of overgrown gingiva was oval and colour was reddish pink. The surface was slick. This lesion covered almost whole canine. It was painless. The oral hygiene of the patient was moderate.
3. Palpation: the intraoral evaluation related to size, shape, site and number was confirmed.

TREATMENT

After oral prophylaxis, the excision biopsy was done by using Nd:YAG laser manufactured by Fotona lasers, with the following specifications: length of the fibre 320 µm, power 2 W and frequency 20 Hz. The fibre was in contact mode with the lesion. Anaesthetic spray was sprayed on the lesion to reduce pain while excision. It took around 5 min to completely excise the lesion. Nd:YAG laser provided clean cutting of the lesion (figures 2 and 3) and maintained haemostasis. The excised lesion was sent to the pathology for further histopathological examination (figure 4). The patient was not prescribed with any analgesics or anti-inflammatory drugs. She was discharged after explaining all the postoperative precautions.



Figure 1 Preoperative view of the lesion.



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Figure 2 Excision of the lesion by using Nd:YAG laser.

OUTCOME AND FOLLOW-UP

The follow-up was done after 1 week and 6 months (figure 5).

Histopathological analysis confirmed the lesion as pyogenic granuloma. The microscopic view of the granuloma showed a hyperplastic stratified squamous epithelium which showed papillomatosis and acanthosis and was partially exposed in one area (figure 6). The underlying subepithelial stroma showed congested blood vessels, capillary proliferation and lymphoplasmacytic infiltrate. Malignancy was not observed.

DISCUSSION

Originally, it was thought that pyogenic granuloma was caused by pyogenic organisms.⁸ But now it is believed that it has no relation with infection. More often, women are affected by pyogenic granuloma due to hormonal changes in their body or while during pregnancy, but it is also common in young adults and children.⁹ Although pyogenic granuloma may be clinically observed approximately at any age, but it is mostly occurs at the ages between 8 years¹⁰ and 75 years.¹¹

Basically, pyogenic granuloma is classified as:



Figure 4 Excised lesion.

1. Non-lobular capillary haemangioma (pedunculated form)—77%.
 2. Lobular Capillary Haemangioma (sessile form)—66%.
- They both show different histological features.

There are different methods that have been used to treat pyogenic granuloma like excisional biopsy, liquid nitrogen spray,¹² flash lamp pumped pulsed dye laser,¹³ corticosteroids,¹⁴ injection of absolute alcohol,¹⁵ use of sclerosing agent like monoethanolamine oleate,¹⁶ carbon dioxide laser,¹⁷ Nd:YAG laser,⁵ Er:YAG laser,¹⁸ etc.

Lasers are a better option for treating pyogenic granuloma because there is a lower risk of bleeding while excision and a mild pain that is bearable. Out of all the lasers, Nd:YAG lasers are mostly chosen for excision because they have better coagulation characteristics. Lasers show no adverse effects on patients. The treatment time is very less and the healing process is fast compared with the surgical excision of pyogenic granuloma. Lasers are the successful treatment modality for pyogenic granuloma.

Fekrazard *et al*¹⁸ performed a laser surgery for treating a pyogenic granuloma of a 24-year-old female patient. The lesion was present on the buccal and palatal side of 5 six maxillary teeth. They used Er:YAG laser with 3 W, 10 Hz, 300 mJ and contact mode technique. The patient had no



Figure 3 Postoperative view just after the removal of lesion.



Figure 5 Follow-up after 6 months.

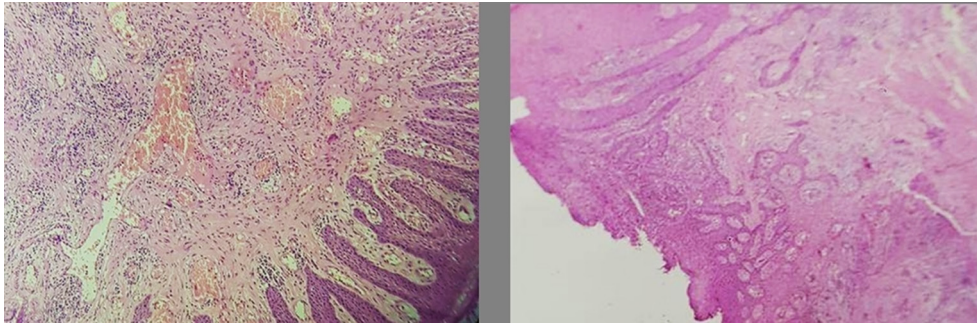


Figure 6 Histopathological view of the pyogenic granuloma.

pain after the surgery and was regularly kept on follow-up for the period of 9 months. They concluded that the result was positive; it is a safe and effective technique for lesion excision.

Another case reported by Al-Mohaya¹⁹ was of a 51-year-old patient having a long history of diabetes type II and had a complaint of pyogenic granuloma covering the buccal region. It was treated by using diode laser of 940 nm in length and in contact mode. After the treatment, the patient had no pain and the healing process was fast, it was a suture-less procedure and improves homeostasis. Another case reported by Rakesh *et al*,²⁰ also used diode laser to treat pyogenic granuloma of a 12-year-old patient having complaint of pyogenic granuloma in the right buccal mucosa near the angle of the mouth. The specifications of diode laser in this case were 350 μ m fibre and in contact mode. The excision was successful and healing process was swift.

Kocaman *et al*⁵ used Nd:YAG laser to treat pyogenic granuloma of 14-year-old female patient having complaint of overgrown gingiva on the buccal site of her mandibular teeth (premolar). The specifications of Nd:YAG laser for the treatment were 4 W, 100 mJ and 40 Hz. The excision was complete within few minutes and the excised area was healed within a month.

Another study of Truschneegg *et al*¹⁷ reported a case of 67-year-old male patient having a lesion around two implants in the lower jaw. The pyogenic granuloma was removed by using carbon dioxide laser. The treatment process was successful without any adverse effects. After the excision, the patient was called for a follow-up and no medications were given. Healing was fast.

Another case report reported by Verma in 2014²¹ involved a 12-year-old female patient who had a complaint of a huge

lesion over growth from lower right canine to first molar. The lesion was excised by surgery, and postsurgery, the patient was advised with medications from the medicine department. The excised lesion was sent for histopathological examination.

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Learning points

- Lasers are useful in treating pyogenic granuloma because while excision there is bloodless field, rapid healing and no stitches were required.
- It is a painless procedure.
- It reduces postoperative infection and that is why the patient does not require any medications (analgesics or antibiotics) for rapid healing or relief in pain.
- This method requires less time compared with other surgical technique.

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