



Er,Cr:YSGG Laser-assisted Excision of Pregnancy Tumor

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Purpose: Periodontal health is compromised during pregnancy due to increased susceptibility to inflammation. Complications may arise in the form of gingivitis or tumor. The decision regarding treatment becomes a challenge to the clinician, as a minimally invasive and stressless procedure is a necessity. This case report describes the management of pregnancy tumor by excision with Er,Cr:YSGG laser in the 3rd trimester of pregnancy.

Materials and Methods: A 24-year-old pregnant patient at 36 weeks of gestation presented with a growth on the maxillary labial gingiva. The growth interfered with speech and mastication, causing discomfort to the patient. Er,Cr:YSGG laser at 1.50 W, 10% water, 11% air in continuous contact mode was used to excise the pregnancy tumor.

Results: Uneventful healing and preservation of the gingival architecture was achieved with the use of laser for excision.

Conclusion: The use of laser enabled a surgical procedure in the 9th month of pregnancy without infiltrative anesthesia, and it subjected the patient to minimal stress.

Keywords: pregnancy, pregnancy tumor, pyogenic granuloma, granuloma gravidarum, laser, periodontal.

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Pregnancy has been seen to increase susceptibility to gingival inflammation.¹ Pregnancy tumor is a benign hyperplastic gingival lesion occurring during pregnancy,² usually arising in an area of previously inflamed gingiva, and is mostly associated with poor oral hygiene, which serves as an irritant.³⁻⁵ This rapidly growing tumor usually appears during the second or third month of pregnancy. Although an involution usually occurs after parturition, interference with function may make the excision of the tumor inevitable. The treatment modalities include surgical excision with a scalpel, radiosurgery, pulsed laser surgery, cryosurgery, and intralesional injections of ethanol, sodium tetracycline sulphate, or corticosteroid.⁶

The decision for elective surgery during pregnancy is need-based. The goal of precise tissue removal with minimal stress and trauma to the patient has prompted practitioners to explore new treatment modalities. Laser has become a reliable and acceptable treatment option due to less postoperative discomfort and rapid healing. An Er,Cr:YSGG laser (Waterlase C100, Biolase Technology; San Clemente, CA, USA) was used for the case presented in this paper. It is a laser-powered hydrokinetic system that produces a wavelength which has highest absorption in water molecules and targets the hydroxyl radical in the apatite crystal of dental hard tissues. The Er,Cr:YSGG laser emits at a wavelength of 2780 nm and delivers photons



Fig 1 Preoperative view of growth on maxillary labial gingiva spanning right maxillary central and lateral incisors.

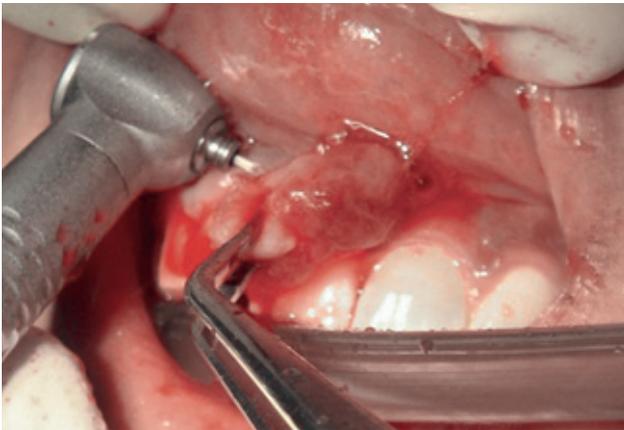


Fig 2 Er,Cr:YSGG laser-assisted excision of pregnancy tumor.



Fig 3 Excised pregnancy tumor showing lobulated appearance.

into an air-water spray matrix, causing rapid expansion of the water within the mineral substrate, producing microexplosive forces. It cuts enamel, dentin, cementum, bone, and soft tissues cleanly and effectively. The medium which enables photon amplification includes heterogeneous crystals of yttrium, scandium, gallium, and garnet. The crystal matrix also contains dopants of erbium and chromium to enhance the performance of the laser emission.⁷

MATERIALS AND METHODS

A 24-year-old woman in the 36th week of pregnancy reported to the Department of Periodontics, Maulana Azad Institute of Dental Sciences, New Delhi, with a growth on the maxillary labial gingiva. The patient was in good health and had no other significant medical or family history.

She first noticed the lesion at 28 weeks of pregnancy; it had been increasing in size ever since. The clinical examination revealed a lobulated exophytic mass with a smooth surface on a pedunculated base measuring 3.5 x 2.5 x 2.0 cm localized at the right central and lateral incisors with gingival inflammation and associated dental plaque. The lesion was hemorrhagic, compressible, and bled on manipulation and during eating, but it was not painful (Fig 1).

The condition was explained to the patient, and an oral hygiene program was initiated. Since the tumor interfered with oral hygiene measures, mastication and speech function, an elective surgery was planned. She was reassured that the surgical removal of growth would not affect her fetus.

Immediately before the procedure, the patient rinsed for 1 min with a 0.12% chlorhexidine digluconate solution (Periogard oral rinse, Colgate Oral Pharmaceuticals; New York, NY, USA). Topical anesthesia in the form of a 2% lignocaine hydrochloride gel (xylocaïne 2% gel, AstraZeneca; London, UK) was used. No infiltrative anesthesia was used. An Er,Cr:YSGG laser-assisted (Waterlase C100, Biolase Technology) surgical excision was performed using a sapphire cylindrical tip (length = 6 mm; diameter = 6 µm) (Fig 2). The laser settings for the surgery were 1.50 W, 10% water, 11% air in continuous contact mode (Fig 3). Coagulation was achieved and laser bandaging was done by setting the laser at 0.50 W, 0% water and 0% air using a total of 8 pulses (Fig 4). No sutures were placed. Since the postoperative discomfort was minimal, the patient did not require any analgesic or anti-inflammatory medication.

RESULTS

Histopathological analysis of the excised tumor was performed. Hematoxylin and eosin staining revealed highly vascularized tissue with a dense inflammatory infiltrate, which confirmed the clinical diagnosis of pyogenic granuloma (Fig 5). Wound healing 1 week after the surgery was found to be uneventful (Fig 6). With the use of laser, precise excision was achieved with preservation of gingival architecture. Recall and follow-up of the patient revealed complete healing with normal and healthy gingival mucosa and no recurrence.

DISCUSSION

Increased female hormone levels during pregnancy are suggested to be related to the increased susceptibility to gingival inflammation, without a certain association with the amount of dental plaque accumulation.¹ Gestational steroid changes do not independently trigger the development of granuloma gravidarum but seem to aggravate previously latent gingivitis and the subsequent exacerbated inflammatory tissue response, leading to the development of this proliferative lesion.⁸ Gingival irritation is the factor that triggers the development of pyogenic granuloma. The microulceration, due to predisposing irritant factors in already inflamed gums, enables oral microflora of low virulence to reach the gingival connective tissue, thus producing a hyperplastic vascular response that leads to the formation of the pyogenic granuloma.⁹ Clinically, a pregnancy tumor is a tumor-like growth, generally appearing as a solitary pedunculated or sessile nodule, usually ulcerated, soft, friable, nontender, of limited growth potential, and painless.^{10,11} Pregnancy tumor is also known as pregnancy granuloma, angiogranuloma, and granuloma gravidarum. Treatment protocols suggested for its removal include Nd:YAG laser, flash lamp pulsed dye laser, cryosurgery, intralesional injection of ethanol or corticosteroid, and sodium tetradecyl sulfate sclerotherapy, although excisional surgery remains the treatment of choice.⁶ In most cases, the pregnancy tumor resolves spontaneously after parturition, and therefore surgical treatment is not recommended if the lesion is asymptomatic. Interference with function, or severe bleeding or pain necessitates surgical removal.⁴ The size and location of the growth may interfere with mastication, affecting nutrition and consequently fetal development.⁸ Successful obliteration requires removal of local stimuli and improved oral hygiene.



Fig 4 Immediate postoperative view showing coagulation achieved at excised site.

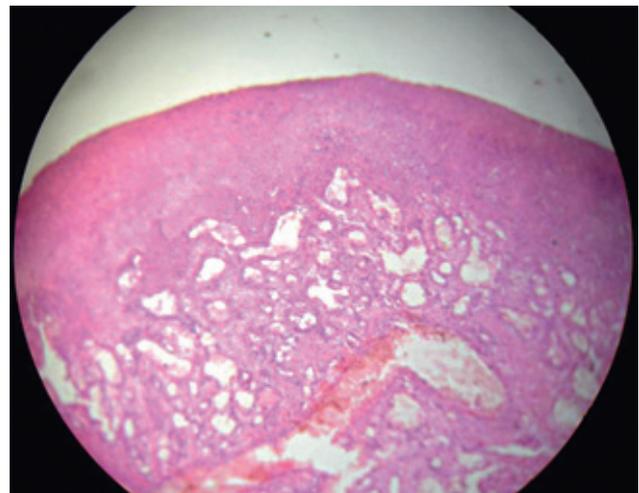


Fig 5 Histological picture showing highly vascularised tissue with a dense inflammatory infiltrate (H and E).



Fig 6 Frontal view 1 week after surgery.

This case report describes the treatment of pregnancy tumor by excision with Er,Cr:YSGG laser. The growth caused difficulty in mastication and speech, along with cosmetic concern to the patient, rendering the excision obligatory. The decision on treatment modality was based on the reasoning that the patient should experience as little stress and anxiety as possible. Since the patient was in the 36th week of gestation, it was decided to use Er,Cr:YSGG laser instead of conventional scalpel surgical excision. Thus, infiltrative anesthesia, which could have increased stress, was avoided. A precise removal was achieved with minimal discomfort to patient.

An excision with laser results in less bleeding and superior healing. As the blood vessels are sealed, there is improved hemostasis and coagulation postoperatively, with a reduced need for postsurgical dressings. With use of laser, the need for analgetic and anti-inflammatory medication is also reduced. Rapid healing can be observed within days after treatment. Er,Cr:YSGG laser also depolarizes nerves, thus reducing postoperative pain, and destroys many bacterial and viral colonies that may potentially cause infection. Reduced postoperative discomfort, decreased edema, minimal scarring, and less shrinkage are the other advantages associated with its use.¹²⁻¹⁴

With its numerous benefits, laser has emerged as an acceptable and valuable treatment modality. As compared to conventional treatment approaches, laser leads to better treatment outcomes. Pregnancy tumor has a high frequency of occurrence, and a consensus on treatment protocol must be formulated, taking into consideration the newer approaches for treatment.

CONCLUSION

The case presented here demonstrates the efficacy of laser use over other treatment modalities, when elective surgery becomes mandatory and the patient's condition dictates a minimally traumatic and stressless procedure. The use of laser enabled a surgical procedure in the 9th month of pregnancy without infiltrative anesthesia while at the same time subjecting the patient to only minimal stress.

The quest for safe and effective treatment options has made laser a rapidly emerging acceptable treatment option, thus improving treatment and providing better care to patients.

REFERENCES

1. Gürsoy M, Pajukanta R, Sorsa T, Könönen E. Clinical changes in periodontium during pregnancy and post-partum. *J Clin Periodontol* 2008;35:576-583.
2. Tumini V, Di Placido G, D'Archivio D, Del Giglio Matarazzo A. Hyperplastic gingival lesions in pregnancy I. Epidemiology, pathology and clinical aspects. *Minerva Stomatol* 1998;47:159-167.
3. Bhashkar KS, Jackoway JR. Pyogenic granuloma: Clinical features, incidence, histology, and results of treatment. Report of 242 cases. *J Oral Surg* 1996;24:391-398.
4. Manus DA, Sherbert D, Jackson IT. Management considerations for the granuloma of pregnancy. *Plast Reconstr Surg* 1995;95:1045-1050.
5. Anneroth G, Sigurdson A. Hyperplastic lesions of the gingiva and alveolar mucosa. A study of 175 cases. *Acta Odontol Scand* 1983;41:75-86.
6. Jafarzadeh H, Sanatkhan M, Mohtasham N. Oral pyogenic granuloma: a review. *J Oral Sci* 2006;48:167-175.
7. Rizoiu I, Kohanghadosh F, Kimmel AI, Eversole LR. Pulpal thermal response to erbium, chromium:YSGG pulsed laser hydrokinetic system. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998;86:220-223.
8. Sills ES, Zegarelli DJ, Hoschander MM, Strider WE. Clinical diagnosis and management of hormonally responsive oral pregnancy tumor (pyogenic granuloma). *J Reproduct Med* 1996;41:467-470.
9. Villmann A, Villmann P, Villmann H. Pyogenic granuloma: evaluation of oral condition. *Br J Oral Maxillofac Surg* 1986;24:376.
10. Pinkham JR, Casamassimo PS, Fields HW, McTigue DJ, Nowak AJ. *Pediatric dentistry: infancy through adolescence*, ed 4. St. Louis: Elsevier Saunders, 2005:38.
11. Laskaris G. *Color Atlas of Oral Diseases*, ed 3. New York: Thieme, 2003:400.
12. Boj J. The future of laser pediatric dentistry. *J Oral Laser Applic* 2005;5:173-177.
13. Schoop U, Kluger W, Moritz A, Nedjelik N, Georgopoulos A, Sperr W. Bactericidal effect of different laser systems in the deep layers of dentin. *Lasers Surg Med* 2004;35:111-116.
14. Boj J, Galofre N, Espana A, Espasa E. Pain perception in pediatric patients undergoing laser treatments. *J Oral Laser Applic* 2005;5:85-89.

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