

# Pyogenic granuloma treated with continuous wave CO<sub>2</sub> laser followed by ultrapulsed CO<sub>2</sub> laser ablation

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## ABSTRACT

Pyogenic granuloma is a benign polypoidal or exophytic vascular lesion. It can occur at any age. The hypothetical etiologies include trauma, viral or hormonal factors. A total of 16 patients were enrolled in the study after taking consent. A total of 4 females and 12 males. All of them had single lesions which tend to bleed especially on touching. All of them were satisfied with the treatment. Regarding the immediate side effect, 6 patients developed transient bleeding, which was stopped after 15 minutes of pressing the bleeding areas. 1 patient reported recurrence after 3 months, which may be due to incomplete removal of the lesion. No other side effect was seen in all the patients. The combined continuous-wave/pulsed CO<sub>2</sub> laser is our treatment of choice for pyogenic granuloma as it provides less bleeding than the other modalities.

**Keywords:** Pyogenic granuloma; continuous-wave; ultrapulsed CO<sub>2</sub> laser

## INTRODUCTION

Pyogenic granuloma is a benign polypoidal or exophytic vascular lesion. It can occur at any age. In children, there is slight male predominance. In adult, female dominance is due to pregnancy related lesions [1,2]. There is no racial or familial predisposition. The exact etiopathogenesis is not clear. It may be due to NO synthase dependent mechanism which contributes to angiogenesis [2-4]. The hypothetical etiologies include trauma, viral or hormonal factors [1-5]. It usually presents as a solitary, well-circumscribed, dome-shaped, 1-10mm or more, sessile or pedunculated, bright or dull red, smooth nodule with tendency to bleed. Histopathology reveals a lobular pattern separated by fibrous septa. Each lobule consists of capillaries and venules lined by plump endothelial cells, embedded in a gelatinous stroma [3-7]. The overlying epidermis may embrace the lesion. The current treatment includes shave removal, surgical excision, curettage, chemical or electrical cauterization, cryotherapy, CO<sub>2</sub> laser ablation and pulsed dye laser [6-8].

## MATERIAL AND METHODS

Patients who were diagnosed to have pyoderma ganrenosum are enrolled in the study (Fig. 1). Informed consent was taken from all the patients. A total of 16 patients were enrolled in the study. Ethical clearance from the college was taken as per norm.

Investigations like haemogram, ESR, Liver function test, renal function test, urine r/m and BT/CT/PTTK were done to exclude comorbidities which can cause complications and for post treatment purpose. Photographs were taken prior to the treatment and just after the treatment. The treatment area was cleaned with soap water, followed by betadine (spirit was not used as it is inflammable). The area was given local anaesthesia 2% (lignocaine 1:20000, ring block) and wait for 5-10 minutes. Then, continuous wave 3 mj/cm<sup>2</sup> was used for ablation of the bulk at the peduncle. When the bulk was reduced, Ultrapulsed 1-3 mj/cm<sup>2</sup> (depends on the lesions) was given to maintain ablation as well as for haemostasis. In case of bleeding (although not common after CO<sub>2</sub> laser, the patients were asked to

**How to cite this article:** Zonunsanga. Pyogenic granuloma treated with continuous wave CO<sub>2</sub> laser followed by ultrapulsed CO<sub>2</sub> laser ablation. Our Dermatol Online. 2014;6(2):160-162.

**Submission:** 23.10.2014; **Acceptance:** 15.03.2015

**DOI:**10.7241/ourd.20152.42

press the bleeding areas for 15 -20 minutes and the bleeding stops. Dressing with Betadine was done everyday and antibiotic cream was applied till healing occurs. Oral antibiotic was also given for 7 days along with nonsteroidal anti inflammatory for few days to suppress trauma induced inflammation. The patients were followed up for 6 months.

## RESULTS

A total of 16 patients were enrolled in the study after taking consent. A total of 4 females and 12 males. All of them had single lesions which tend to bleed especially on touching. All of them were satisfied with the treatment (Fig. 2). Regarding the immediate side effect, 6 patients developed transient bleeding, which was stopped after 15 minutes of pressing the bleeding areas. 1 patient reported recurrence after 3 months, which may be due to incomplete removal of the lesion. No other side effect was seen in all the patients.

## DISCUSSION

It is a xenon chloride (XeCl) laser that delivers concentrated, but painless, high-dose radiation directly to target lesions without exposing surrounding healthy tissue. It emits a wavelength of 308nm and shares the physical properties of lasers, Monochromatic and coherent beam of light, Selective treatment of the target, The ability to deliver high fluencies are the main principle. The articulated arm also makes it easier to reach areas that are usually difficult to treat, such as folds and mucosa. The use of a monochromatic wavelength of 308 nm gives photobiological effects superior to those provided by NB-UVB. The main targets for UV-B is DNA contained in epidermal cells (keratinocytes, melanocytes) and, to a lesser extent, in dermal cells (fibroblasts). Inflammatory reactions could also be involved. The decrease in T-lymphocyte proliferation caused by inducing cellular apoptosis resulting from DNA lesions is likely to be one of the most important mechanisms of action of UV-B phototherapy. 308 nm is the most efficient wavelength for inducing DNA lesions on lymphocytes. The dose needed to induce apoptosis in 50% of T lymphocytes is 95 mJ/cm<sup>2</sup> with the 308-nm excimer laser vs. 320 mJ/cm<sup>2</sup> with NB-UVB. Similar levels of depletion of T lymphocytes due to apoptosis after treatment with 308nm monochromatic excimer laser have been reported in psoriasis lesions. The main disadvantages are limited size of spots means that large surfaces (more than 20% of total surface body area)

cannot be treated. Purchase and maintenance costs of devices quite expensive. In this study, limited size of spots means that large surfaces (more than 20% of total surface body area) cannot be treated. Purchase and maintenance costs of devices quite expensive.

Study conducted by Lindenmüller IH on CO<sub>2</sub> laser-assisted treatment of a giant pyogenic granuloma of the gingiva of a 34-year-old woman in the 39th week of pregnancy presented for surgical treatment with a mass on the lingual mandibular gingival [7]. She had been surgically treated alio loco in the 37th week, but this failed. The patient was reassured and an individual oral hygiene programme was initiated in our department. The tumour was about 20 mm in diameter. A CO<sub>2</sub> laser-assisted surgical excision was performed 4 weeks after delivery. The lesion was analysed histopathologically using a von Willebrand Factor immunoreactivity staining. The highly vascularized tissue with a dense inflammatory infiltrate was in accordance with



Figure 1: Lesion pre treatment.



Figure 2: Immediately after ablation.

the diagnosis of a PG. The initial wound healing was uneventful. A 12-month follow-up revealed no recurrence of the mass and healthy periodontal tissues. This report describes an oral complication during pregnancy for which surgical excision of a PG after delivery seemed the best treatment. It is possible that gender-specific periodontal disease risk factors contributed to the development of the lesion. This is another reason why pregnant women should be encouraged to be assessed by oral health professionals before late pregnancy.

Roulin C, et al studied on the combined continuous-wave/pulsed carbon dioxide (CO<sub>2</sub>) laser comprising 1 treatment session with 6-week and 6-month follow-up examinations and evaluations [8]. The laser was first used in continuous mode (power, 15 W) and then in pulsed mode (pulse length, 0.6-0.9 milliseconds; energy fluence, 500 mJ/pulse). Pyogenic granuloma was removed completely in 1 treatment session in 98 patients without recurrence. In 88 cases there were no visible scars; in 10 cases slight textural changes of the skin were observed. Hypertrophic scars or keloids did not occur. Sixty-three patients were very satisfied with the result of the treatment, 37 were satisfied (ie, 100% patient satisfaction) and none indicated that they were not satisfied. No permanent hypopigmentation, hyperpigmentation, or erythema was observed.

In this study, most of the lesions were removed as described. There is no serious side effects including excessive bleeding or scar formation. Patients were satisfied. Small but cosmetically more acceptable scar than the nodules (pretreated) were observed in 50% of the patients, although the patient did not bother as the larger and more troublesome due to bleeding was removed.

## CONCLUSION

The combined continuous-wave/pulsed CO<sub>2</sub> laser is our treatment of choice for pyogenic granuloma as it provides less bleeding than the other modalities.

## CONSENT

The examination of the patient was conducted according to the Declaration of Helsinki principles. Written informed consent was obtained from the patient for publication of this article

## REFERENCES

1. Miller AM, Sahl WJ, Brown SA, Young SK, Quinlan CM, Patel PR, et al. The role of human papillomavirus in the development of pyogenic granulomas. *Int J Dermatol.* 1997;36:673-6
2. Wilson BB, Greer KE, Cooper PH. Eruptive disseminated lobular capillary hemangioma (pyogenic granuloma). *J Am Acad Dermatol.* 1989;21:391-4
3. Harris MN, Desai R, Chuang TY, Hood AF, Mirowski GW. Lobular capillary hemangiomas: An epidemiologic report, with emphasis on cutaneous lesions. *J Am Acad Dermatol.* 2000;42:1012-6.
4. Park YH, Hough W. Subcutaneous and superficial granuloma pyogenicum. *Int J Dermatol.* 1996;35:205-6.
5. Cooper PH, McAllister HA, Helwig EB. Intravenous pyogenic granuloma. A study of 18 cases. *Am J Surg Pathol.* 1979;3:221-8.
6. Lawoyin JO, Arotiba JT, Dosumu OO. Oral pyogenic granuloma: a review of 38 cases from Ibadan, Nigeria. *Br J Oral Maxillofac Surg.* 1997;35:185-9.
7. Lindenmüller IH, Noll P, Mameghani T, Walter C. CO<sub>2</sub> laser-assisted treatment of a giant pyogenic granuloma of the gingiva. *Int J Dent Hyg.* 2010;8:249-52.
8. Raulin C, Greve B, Hammes S. The combined continuous-wave/pulsed carbon dioxide laser for treatment of pyogenic granuloma. *Arch Dermatol.* 2002;138:33-7.

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Source of Support: Nil, Conflict of Interest: None declared.