

## Laser Assisted Management of Eyelid Nevus

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### Abstract

Pigmented lesions especially over the face are one of the commonest presentations in plastic surgery outpatient department. Surgical excision and primary closure of the defect is main stay of treatment. Surgeon use surgical blade for making the incision and faces significant amount of bleeding after incision as face is highly vascular area. Bleeding obscures the operative field and also makes further procedure difficult. Even though we are traditionally using scalpel for skin incisions, incisions made using electromagnetic radiation of high frequency in the form of laser are considered to be of more cosmetic value, less time taking, less bleeding, less post-operative pain, no ill effects on wound healing. Even though CO<sub>2</sub> laser is may also be used for nevus excision but use of diode laser is more applicable as compared to CO<sub>2</sub> laser.

**Keywords:** Nevus; CO<sub>2</sub> Laser; Diode laser.

### Introduction

Skin bleeding after making the incision is one of the common problems faced by surgeon during surgery. Continuous need of mopping or suction causes interference during surgery. Because of highly vascular region incisions over the face, leads to significant amount of bleeding. Surgeon feels discomfort; number of gauze pieces, suture material, and precious operating time is also wasted. The usage of laser decreases skin bleeding surgeon feels comfortable and total operative time also shortens.

Laser was introduced by Maiman in 1960 [1], who used ruby to make laser. After that, (Carbon Dioxide Laser) CO<sub>2</sub> and Neodymium Doped Yttrium Aluminum Garnet (Nd: YAG) lasers were developed. In medical field, laser was first used for photocoagulation of retina in 1960 [2].

Today, there are different types of lasers available for use: CO<sub>2</sub>, Nd: YAG, Holmium Yttrium Aluminum Garnet (Ho: YAG), (Erbium, Chromium doped Yttrium Scandium Gallium Garnet) Er, Cr: YSGG, Neodymium doped Yttrium Aluminum Perovskite (Nd: YAP), Gallium arsenide (GaAs) (diode), and Argon [3].

In comparison with conventional scalpel, laser has many benefits, such as ease of soft tissue ablation, homeostasis [4], instant sterilization, and reduced bacteremia, less wound contraction, reduced edema, minimal scar, reduced mechanical trauma, less operative and post-operative pain [5-7].

Various advantages of diode laser over CO<sub>2</sub> laser are- suitable for endoscopic approach, suitable for contact approach, smaller size and compact, better homeostasis, longer operating life and cost effective.

### Case report

18 year old female presented in plastic surgery outpatient department of plastic surgery with chief complaints of pigmented lesion (nevus) over lateral aspect of left upper eyelid. A single pigmented lesion of 0.5x0.5 cm with smooth surface and distinct margin was located below the left eyebrow over upper eyelid. Patient was examined and investigated. Other coexisting abnormalities were ruled out. Patient was taken for surgery under local anesthesia. Wavelength specific goggles were worn by the operating surgeon and persons in the operating room. Patient's eyes protected using the eye shield. Measurements and

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markings were made by the operating surgeon. The skin incision was made using diode laser with a frequency of 50 Hz and power of 1.0W, instead of using scalpel. It was noticed that there was no bleeding after skin incision, further excision was performed easily. Autologous platelet rich plasma (APRP) was injected around wound margin. Incision was closed primarily using 6-0 prolene suture. The duration of surgery was remarkably less.



**Fig. 1:** Preoperative picture showing nevus and Excision marking



**Fig. 2:** Showing setting of diode laser used of incision



**Fig. 3:** Showing diode laser being used for incision



**Fig. 4:** Showing injecting APRP



**Fig. 5:** Post-operative picture showing primary closure

The skin incision had no deleterious effect on the skin and the wound healed normally and the scar was cosmetically acceptable.

## Discussion

One of the most widely used applications of laser is soft tissue surgery and ablation of lesions. The advantages of laser application are relatively bloodless surgery, minimal swelling, scarring and coagulation, reduction in surgical time and less or no post-surgical pain. Also, the laser instantly disinfects the surgical wound as well as allowing less mechanical trauma to the tissue. Laser transmits energy to the cells causing warming, welding, coagulation, protein denaturation, drying, vaporization and carbonization.

The diode laser was introduced in dentistry and oral surgery in the mid-90s [6, 8]. The diode laser devices have specifications such as relatively small

size, portable and lower cost that attract the dental practitioners and oral surgeons for use in various surgical indications in comparison to other laser equipment. The pump source is an electrical current, the photons are produced by electric current and laser active medium is semiconductor. The diode lasers have been used in three wavelengths 810,940 and 980nm in surgical treatments. Provided correct selection and application of diode lasers in soft tissue surgery, for example frenectomy, epulis fissuratum, fibroma, facial pigmentation and vascular lesions, they are safety and useful [4].

In almost all researches the scientists declared the unique specialties of lasers and particularly diode lasers such as; sharp and definite cutting edge, homeostasis and coagulation after surgery in addition to small size and better maneuver during application, which makes this laser very effective and a useful alternative device in soft tissue surgery in comparison to other lasers types such as Carbon Dioxide (CO<sub>2</sub>) Laser and erbium lasers. CO<sub>2</sub> laser is smaller in size, easily transferable and procedure can be done on outpatient basis.

The disadvantages reported in researches on diode laser application were somehow similar to other lasers, like, delayed repair which is prominent 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 not high enough to do so. Laser induced wounds because of definite and clean wound, generally heal well compared to scalpel incisions. This is may be due to the minimal degree of wound contraction following laser irradiation which occurs through induction and formation of smaller number of myofibroblasts and collagen [11, 12].

### Conclusion

Our case demonstrated diode lasers can be used in nevus excision surgery safely as an alternative to scalpel because of easy application, better coagulation with less bleeding, less operative time and no undesirable cosmetic effects. Diode laser seems to be more effective especially in terms of being

small in size, suitable for contact use also, portable and superior haemostatic ability.

### References

1. Maiman TH. Stimulated optical radiation in ruby. *Nature*. 1960; 187: 493-4.
2. Mahajan A. Lasers in periodontics-a review. *Eur J Dent Med*. 2011; 3: 1-11.
3. Bains VK, Gupta S, Bains R. Lasers in periodontics: An Overview. *J Oral Health Community Dent*. 2010; 4: 29-34.
4. Ishikawa I, Aoki A, Takasaki AA, Mizutani K, Sasaki KM, Izumi Y. Application of laser in periodontics: true innovation or myth? *Periodontol 2000*. 2009; 50: 90-126.
5. Cobb CM. Lasers in peroidontics: A review of the literature. *J Peridontol*. 2006; 77(4): 545-64.
6. Wigdor HA, Walsh JT Jr, Featherstone JDB, Virsuri SR, Fried D, Waldvogel JL. Lasers in dentistry. *Lasers Surg Med*. 1995; 16(2): 103-33.
7. Luomanen M, Meurman JH, Lehto VP. Extracellular matrix in healing co2 laser incision wound. *J Oral Pathol*. 1987; 16(6): 322-31.
8. Eliades A, Stavrianos C, Kokkas A, Kafas P, Nazaroglou I. 808 nm diode laser in oral surgery: A case report of laser removal of fibroma. *Res J Med Sci*. 2010; 4(3): 175-8.
9. Pick RM, Pecaro BC. Use of the CO2 laser in soft tissue dental surgery. *Lasers Surg Med*. 1987; 7: 207-13.
10. Pecaro BC, Garehime WJ. The CO2 laser in oral and maxillofacial surgery. *J Oral Maxillofac Surg*. 1983; 41: 725-8.
11. Chomette G, Auriol M, Labrousse F, Vaillant JM. [The effect of CO2 laser radiation on the morphological changes of mucocutaneous wound healing in oral surgery A histoenzymologic and ultrastructural study] *Rev Stomatol Chir Maxillofac*. 1991; 92: 1-7. French.
12. Zeinoun T, Nammour S, Dourov N, Aftimos G, Luomanen M. Myofibroblasts in healing laser excision wounds. *Lasers Surg Med*. 2001; 28(1): 74-9.