

## Laser Update in Endodontics **Kapil Jhajharia\***

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### Editorial

The use of laser has been well-documented in medical field. In the field of dentistry, laser technology is becoming popular day by day. The applications of these lasers have improved the prognosis and outcome of dental treatments. The role of lasers in general dentistry has been well-documented in various literatures. This editorial presents a brief review of laser applications in various endodontic treatments and procedures in the field of Endodontics.

The primary concern in Endodontics is to achieve optimum disinfection of root canal system. Various methods have been described in literature to have clean root canal such as chemical irrigation, use of ultrasonic system. Nowadays, laser dentistry has made revolutionary impact in dentistry. In the field of Endodontics, laser primarily known to use for disinfecting root canal with better results. Laser made possible to penetrate in those complex areas of root canal such as lateral canal, which are very difficult to clean [1].

With laser technology, better results achieved by increasing cleaning ability of canal and removing smear layer and debris from infected canal [2]. In 1971, lasers in Endodontics were first documented by Weichman and Johnson, which they used to seal the apical foramen using CO<sub>2</sub> laser *in vitro* [3].

In 1997, FDA approved the first dental hard tissue Er: YAG laser and the Er, Cr: YSGG a year later to use [4]. The use of lasers has increased greatly in clinics. Nowadays, lasers are suggested to use in a variety of dental treatments. Different types of laser are used in dental practices such as Argon, Carbon dioxide laser, Nd: YAG, Erbium: yttrium-aluminum-garnet (Er: YAG), Krypton-fluoride, Xenon-fluoride [5,6].

### Laser Applications in Endodontic Procedures

Applications of lasers in Endodontics for various procedures have been now well known. For example, in analgesia, the pulsed Nd:YAG laser is vastly used for analgesia or to relieve pain of tooth in Endodontics [7]. The wavelength of this laser interferes with the sodium pump mechanism leading to change permeability of cell membrane. To check the Pulp Vitality, laser Doppler is used for this purpose, which is a noninvasive method to assess and measure the rate of blood flow in a tissue.

In Direct Pulp Capping by laser, CO<sub>2</sub> laser irradiation is used.

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Pulsed Nd: YAG, Argon, semiconductor diode, and Er:YAG can also be used. CO<sub>2</sub> laser can also be implicated to Ablate and accessory treatment for vital pulp amputation [8,9].

In Root Canal Treatment, laser has been used widely from initial to last steps of root canal procedure [10]. Er, Cr:YSGG (2780 nm) and Er:YAG (2940 nm) can be used for access cavity preparation, root canal shaping and cleaning. Nd:YAG (1064 nm) are used for root canal wall preparation [11]. When pulsed Nd:YAG laser is used at 15 Hz/1.5 W, smear layer can be eradicated completely with sealing of dentinal tubules [12]. Nd:YAG application can be used to remove of pulp remnants and debris at the apical foramen as well as control of hemorrhage. Obturation of root canals can also be done with lasers using vertical condensation.

These lasers also have significant role in endodontic surgery procedures. For example, treatment of periapical lesions of sinus tract can be done by Pulsed Nd:YAG and CO<sub>2</sub> lasers. These lasers fasten the healing of wound. In Periapical Curettage, Apicoectomy and Retrograde Cavity Preparation, these Lasers proved to be effective by providing relatively bloodless and much less or no postsurgical pain.

Treatments by lasers have many advantages due to their selective and précised interaction with diseased tissues. Laser also reduces the amount of bacteria and other oral pathogens in the surgical field. There is less pain in most cases. Laser applications provide good hemostasis with reduced need for sutures [13-15].

The dental practitioner should be well-trained to use a laser device. The operator, the patient, and the surgical team should wear protective to avoid eye damage [16]. Lasers can be an essential instrument if used cautiously. Laser applications can

make various dental treatment easy as well as can reduce time, which can help in achieving improved or better care for dental patients overall.

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