



# 林錦松醫師 CASE STUDY

Soft tissue management with YSGG laser in general practice



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great scientist, Albert Einstein, as the theory of “Stimulated Emission of Radiation”. Shawlow and Townes then established the theory of “Light Amplification” in 1958. “LASER” was abbreviated by “Light Amplification by Stimulated Emission of Radiation”, which means “light amplification is produced by stimulated emission of radiation”. The first laser, ruby laser, was developed by Maiman in 1960. Ophthalmologists began using the ruby laser for eye lesion therapy in 1961. The laser was first applied for caries removal by Leo Goldman in 1964.

The characteristics of a laser depend on its wavelength. Wavelength affects not only the clinical applications but also the functional design of a laser. There are several different dental applications and precautions for different types of lasers. For examples, CO<sub>2</sub>, Nd:YAG, Er:YAG, Ho:YAG, and Diode lasers are available for dental and medical surgical specialties. In 1987, Guy Levy tried to pursuit for the dream of “No Needle, No Drill, and No Anesthesia” Dentistry. After ten years, Er,Cr:YSGG (Erbium, Chromium Yttrium, Scandium, Gallium and Garnet), the first Waterlase was developed in 1997. A year later, FDA awarded safety clearance for Er, Cr:YSGG laser in Oct. 1998.

Laser theory was originally developed in 1917 by the



Er, Cr:YSGG laser is a hydrophontonic system, referring to the removal of tissues with highly energized water particles. Strong absorption of laser energy by atomized water droplets results in an intensified yet controlled water particle excitation and microexpansion. The resulting forces induce mechanical separation of surface material. For soft tissue procedures, the Waterlase performs tissue removal, incision, excision, ablation and coagulation. For hard tissue procedure, the Waterlase performs tissue cutting, shaving, contouring, roughing, etching, and resection. It does not produce heat and vibration and does not damage adjacent tissue in the process. Prognosis is so good that increases patient's satisfaction. In most cases, pre-operative anesthesia is not necessary. Topical anesthesia is applied just in case. The main

purpose of this article is to discuss soft tissue management with Waterlase by a series of case reports. The clinical cases include crown lengthening procedure, removal of oral tissue lesion, periodontal surgery, soft tissue management in implant therapy.

**雷**射理論最早是由愛因斯坦於西元 1917 年所提出的，到了 1958 年，Shawlow 和 Townes 將此觀念實現。所謂的雷射 (LASER)，其實是 Light Amplification by Stimulated Emission of Radiation 的縮寫。顧名思義，就是經過放大、增幅的受激發輻射。意即：藉由受激所引發之輻射來進行光放大作用。1960 年梅曼 Maiman 製造出全世界第一具紅寶石雷射。1961 年開始應用於眼科治療。

雷射於 1964 年第一次被 Leo Goldman 用於移除齶齒。laser 的特徵取決於它的波長。波長不僅影響臨床應用，也影響 laser 的功能設計。不同種類的雷射可應用於幾種的牙齒診療與防護。舉例來說，二氧化碳、鈦雅銘、鉕雅銘、鈦雅銘，和二極管雷射，都可用於牙齒和醫療外科專業。1987 年，Guy Levy 希望能成為不需穿刺、不用鑽洞和沒有麻醉的牙醫。1997 年，發展出水雷射。1998 年 10 月美國食品暨藥物管理局核發 Cr:YSGG 雷射的安全許可證。



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