

Office-Based 585nm Pulsed Dye Laser(PDL) Laryngeal Surgery

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History of LASER

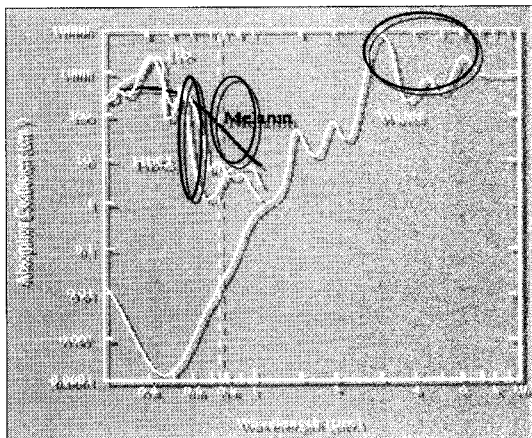
- a. The laser was first used for laryngeal surgery in the 1960s.
- b. 7 type of surgical laser
 - i. 500nm : Argon laser
 - ii. 532nm : KTP
 - iii. 640nm : Dye laser (diode laser, pulsed dye laser)
 - iv. 1060nm : Nd-Yag
 - v. 10600nm : CO2 laser : most common used in laryngeal surgery

Photodynamic Effect of PDL

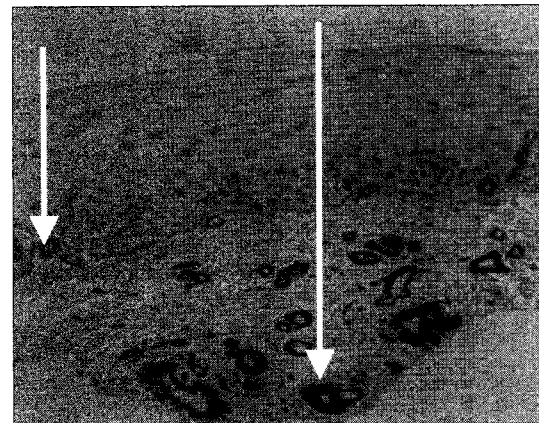
- a. Photoangiolysis of sublesional microcirculation
- b. Photocoagulation of microvascular lesion
- c. Denaturing of basement membrane linking proteins
- d. Cellular destruction
- e. Epithelial dissection
- f. According to the energy level, getting the different surgical effect

Characteristic of PDL

- a. Target point : endogenous chromophore-oxyhemoglobin
- b. Penetrating epithelium without damaging it



- c. Selective photothermolysis
- d. Absorption energy is related to distance from tissue
- e. Providing layer-specific treatment
- f. Low risk for scar formation



	PDL	CO2 Laser	Microlaryngeal surgery
Effect	Photocoagulation	Vaporization	Excision
Target point	Hemoglobin	Water	Mucosa
Plume	No	Yes	No
Surrounding tissue damage	No	Yes	No
Heat effect	Minimal	Localized	No
Scarring	No	Yes	5-10%
Technical difficulty	Mod	Low	High
Bleeding	Mild	Mild	Severe

Setting of PDL

- a. In 1981, dye laser could be used to damage microvasculature (Anderson RR)
- b. 1mm fiber
- c. Spot size : 1-2 mm
- d. Upto 5 joules per pulse with 450 ms pulse width
- e. 1 Hz repetition rate
- f. Fluency of 19-76 joules per square centimeter (j/cm²)

Clinical Application of PDL

- a. Laryngeal papilloma
- b. Vocal fold dysplasia or erythroplasia
- c. Laryngeal granulomas
- d. Vocal polyp
- e. Laryngeal hamangioma
- f. Blood ectasia
- g. Scarred vocal fold and sulcus vocalis

Advantage of PDL

- a. Precise, selective coagulation of the microvasculature
- b. Delivering using a flexible laryngoscope for office-based treatment
- c. Performing it under local anesthesia
- d. Proper tool for difficult case

Disadvantage of PDL

- a. Technical difficulties under local anesthesia
- b. No guide beam
- c. High cost for supplies
- d. Inconsistency of fluency level during operation.

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