

양성 후두병변의 레이저 치료

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안 회 영

Laser Treatment of Benign Laryngeal Lesion

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서 론

wer, , spot size,

CO₂ 가가 (laryngeal microscopic surgery)

YAG(,), KTP, Argon, Diode (suspension laryngoscope), (supraglottiscope)

Holmium : YAG ³⁾⁴⁾ goscope), (suction evacuator)

가 ⁴⁾

CO₂, Nd : , , ⁵⁾

YAG, KTP, Argon (vaporization)

1 μm 가 (: rization)

Nd : YAG, KTP 가 CO₂, 가가 (1 mm)

가 , po-

: , 134 - 701 45

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E - mail : hyahn@hallym.or.kr (Table 1).²⁻⁴⁾

Table 1. Differences in postsurgical state between a cold knife and laser

	Laser	Cold knife
Coagulation necrosis	Present	Absent
Inflammatory reaction	Not marked	Frequently marked
Epithelization	3 wks	2 wks
Excessive granulation	None	Frequent
Scar formation	Minimum	Occasionally marked



Fig. 1. Laryngeal microscopic surgery in use with CO₂ laser and micro-manipulator.

가
가
CO₂ mainipulator 가
, 가
본 본
사용기구
CO₂ CO₂ mainipu-
lator,
hand piece, adaptor
CO₂ hand piece
(ventilating bronchoscope, suspension laryngo-
scope) . hand piece
가 가
, hand piece
(defocused)
가 가 .¹⁸⁾
mainipu-
lator adaptor가

Joy stick
(aimed beam)
(Fig. 1).¹⁾²⁾²³⁾
adaptor
가 가 가 , fiber
ventilating bronchoscope
. Adap-
tor , 1)
2) mainipulator
guide , 3)
scan , 4)
(Fig. 2).
가
1)
CO₂ mainipulator 가
Nd : YAG
KTP
CO₂ .
400 mm
microscopic - micromanipulator spot
size가 250 micron
CO₂ .²⁶⁾

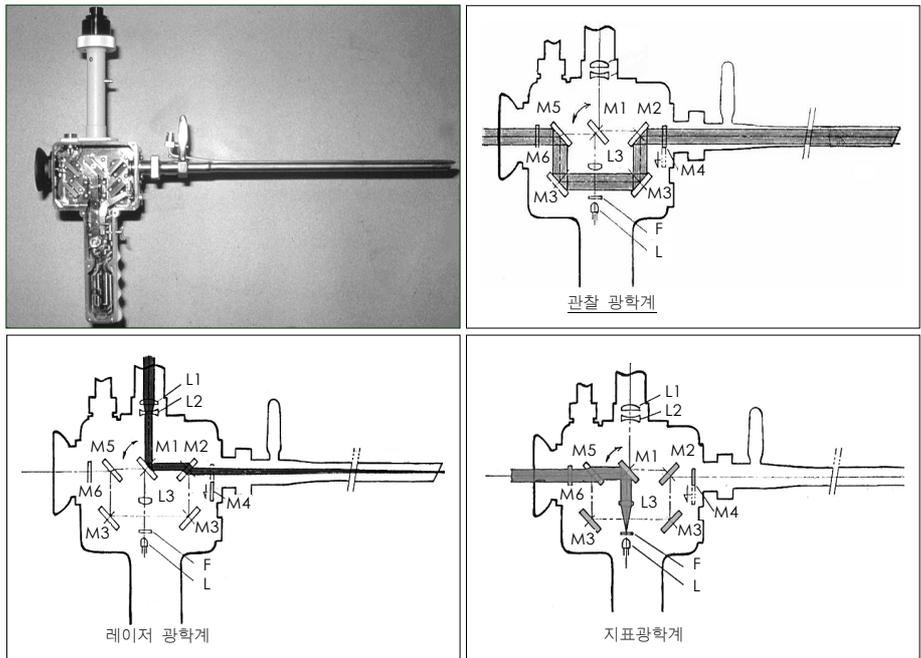


Fig. 2. Laser bronchoscope.

Nd : YAG
1.060 μm 가 extinction length가 60
mm

³⁾⁴⁾ hand piece

hand piece contact type
non contact type 가

tact type 가 con-

piece tip 가 sharp tip
CO₂ 가 (Fig. 3).³⁾

Nd : YAG
, hand piece

KTP
0.532 μm 가
size(200 micron) CO₂

Table 2. Characteristics of lasers

Laser type	Aim accuracy*	Surgical precision#
CO ₂	Low	High
Nd : YAG	Medium	Low
KTP	High	High

* : function of wavelength and delivery method
: function of wavelength

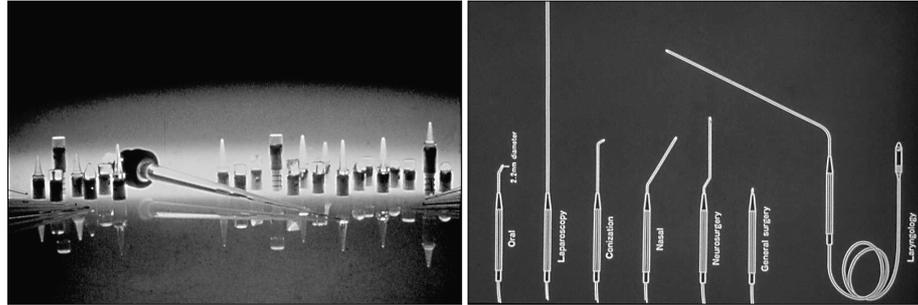
³⁾
KTP 532 Nd : YAG KTP/
YAG 가 가 Nd : YAG CO₂

(Table 2).

Argon
- 0.488~0.514 μm
가

spot Argon extinction length(90%가
)가 m
³⁾

Fig. 3. Nd : YAG laser ; tips (left) and hand pieces (right).



가 spot size 0.15 mm 가

가

가

가

가 argon, KTP Nd : YAG

4)

CO₂, Nd : YAG, KTP Argon

(endotracheal tube) (reflexive tape : Xomed Treace Laser Shield , Xomed Treace, Jacksonville, FL) (reflective metals : LaserFlex, Malinckrodt, Los Angeles, CA)

가 PVC(plain polyvinyl chloride) 가

An- Roesch Red Rubber tube (Hoffmann Laroche, Nutley ; NJ) FDA (reflective tape)

1)

CO₂, Nd : YAG, Argon KTP 20)

(delivery system) 가 CO₂

CO₂ pladget

16 25

가 400 mm 800 레이저 수술시 주의점

μm 200 μm

가 가 3)

Nd : YAG, KTP Argon 가

(halothane, enflurane)
 가
 aluminium foil CO₂
 aluminium foil

가
 (closed ventilator system)
 가 가 CO₂
 (cuff) methylene blue
 (cuff)
⁶⁾ Argon plexiglass 2422 filter, Nd : YAG
 Schott BG 18 KG filter가
 KTP dual - wave len-
 gth multi - wave length goggles
 Jet ventilation (hand
 piece)
 jet ventilation
⁶⁾²⁹⁾³⁹⁾

가 (FiO₂) 30%
 (helium) 가 ¹³⁾²⁰⁾

ANSI(American National Standards Institute)
 Z - 136 1973
 가 ²³⁾

(non - risk), 임상적용
 (low - risk), (high - risk), (clo-
 sed - risk) (nodule), (polyp), (cyst)
 (pedunculated polyp)
¹¹⁾²⁷⁾²⁸⁾ microspot micromani-
 pulator 3 watt
 ANSI - Z 136.1 (focused)
 가 ⁴⁾ (lamina propria)

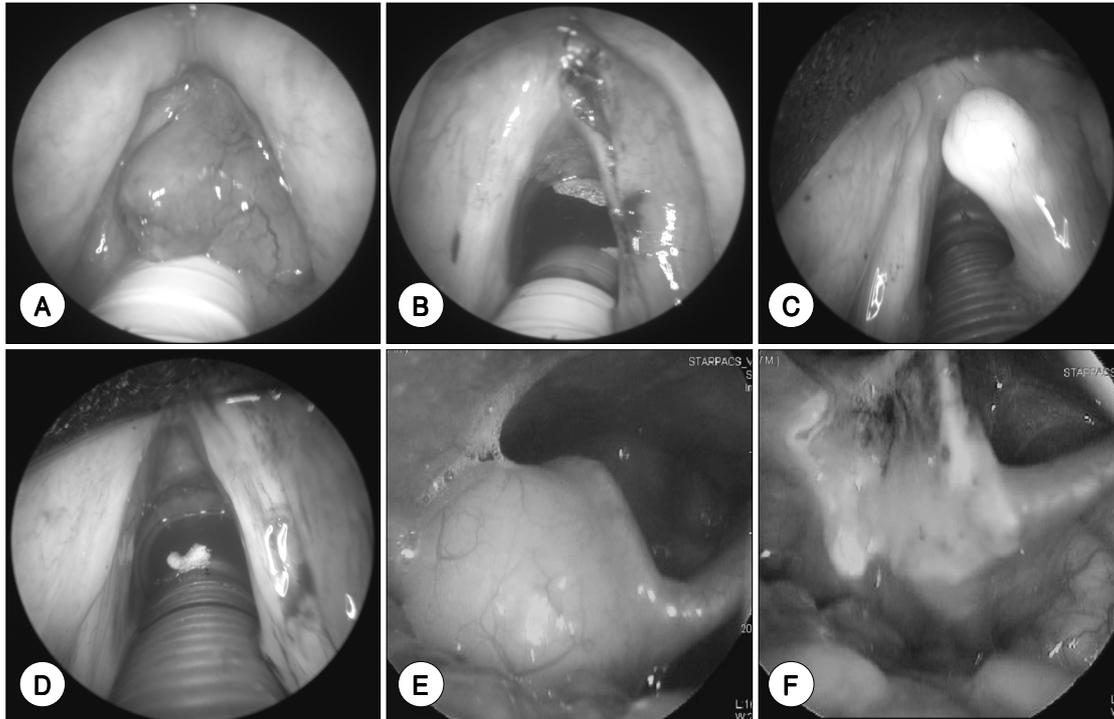


Fig. 4. Intraoperative view of vocal polyp (A), inclusion cyst (C), epiglottic cyst (E) before laser microsurgical excision and immediately after excision (B, D, F).

(Fig. 4). 가 . CO₂ Nd : YAG (ses- 300~400 μmm 1~2 watt 가 (liner vaporization) 가 focused 250 가 μmm 2~3 watt . 0.1 가 0.5 defocused gical cottonoid 2 (Vascular lesions) Nd : YAG , Nd : YAG 4 mm 가 (cold microsurgical technique)

가 . Nd : 가
YAG 가 20 W

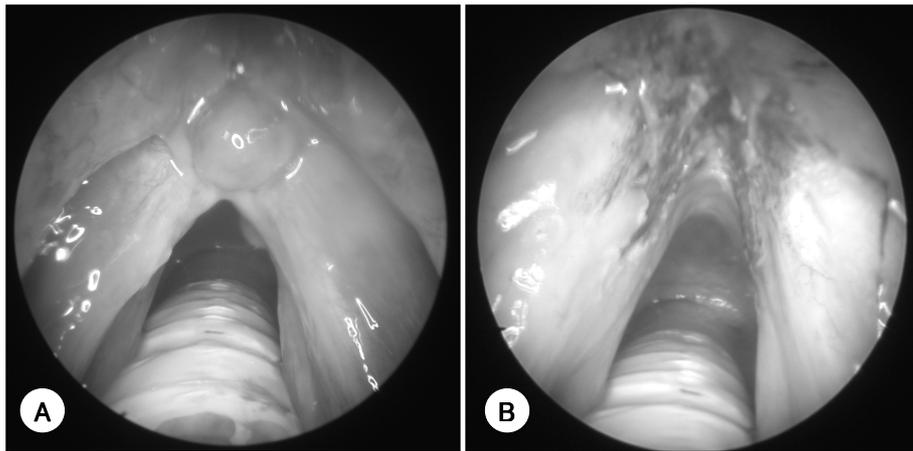


Fig. 5. (A) Intra-operative view of anterior glottic web before laser microsurgical web lysis and (B) immediately after web lysis.

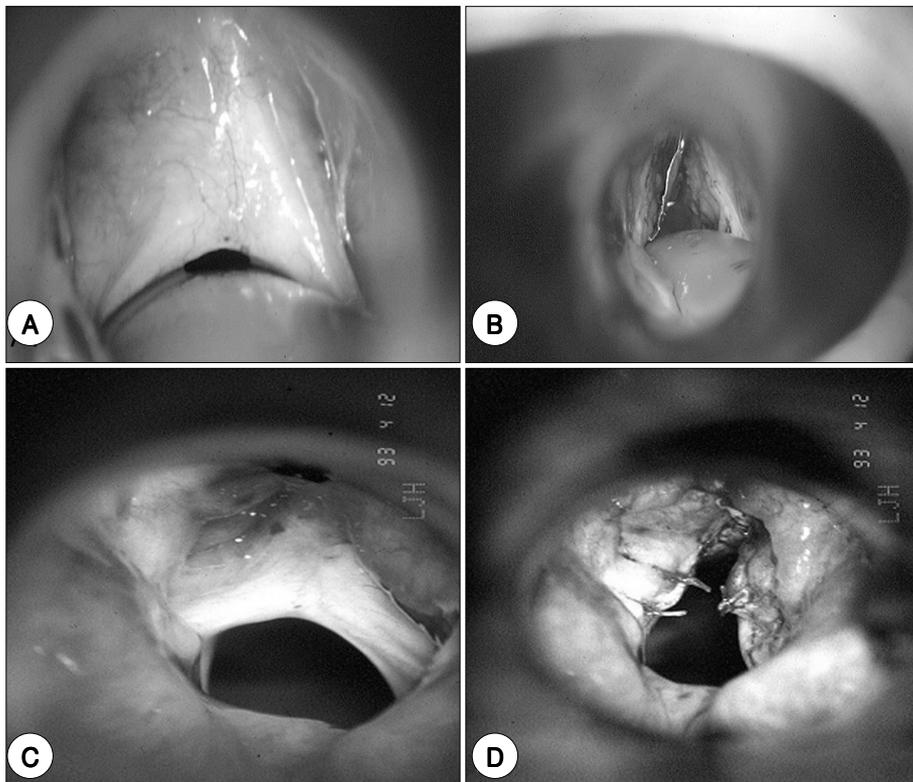


Fig. 6. (A, C) Endoscopic findings of anterior glottic web, (B) keel insertion after CO₂ laser web lysis, (D) suture after micro-trapdoor flap technique using CO₂ laser.

:

6 가 (fixation)

(stenosis) (1984) venturi , CO₂ McGuirt
¹⁷⁾ CO₂

Fearon Cinnamon (1976) Simpson
 CO₂ 2
 (1979) ³⁰⁾ Strong(1979)

silastic roll stent (spot - welded)
³²⁾ 가 Dedo Sooy(1984) ,
 CO₂
 1/3 (micro - trapdoor flap)
⁸⁾ CO₂

, 3~4 가, (mi-
 4 cro - trapdoor flap)

8 stent (anterior glottic webs) CO₂
 microknife Dedo
 , fibrin glue, 가 1 cm
 (Fig. 5, 6). ⁸⁾ 1 cm
 (radial) 가

2 CO₂ laser keel stent ¹⁵⁾ Silastic
 (Dow Corning, Arlington, TN)
 (cricothyroid membrane), (thyrohyoid membrane) (granulation tissue)
 CO₂
 (posterior glottic stenosis)
 (abduction)

(cricoarytenoid joint)

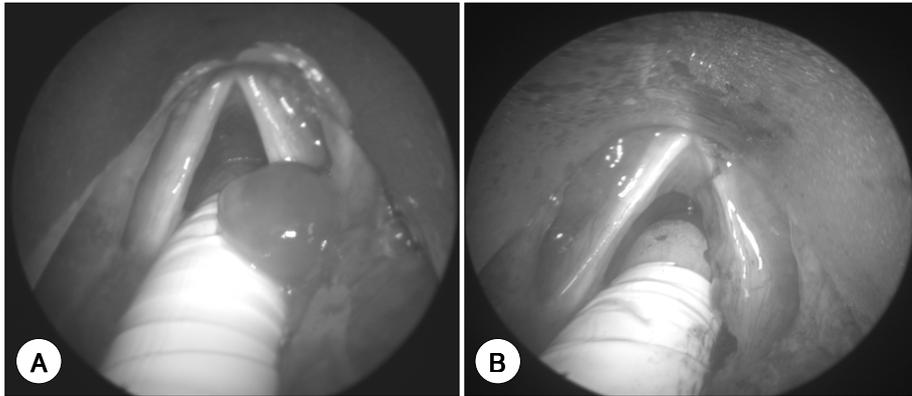


Fig. 7. (A) Intraoperative view of intubation granuloma of right vocal cord before laser microsurgical excision and (B) immediately after excision.

(Fig. 7).

가

CO₂

(posterior cordectomy),⁹⁾ (medial arytenoidectomy)⁷⁾ (standard total arytenoidectomy)²⁴⁾ Dennis CO₂,

Kashima (posterior cordectomy) Crumley

KTP

⁹⁾

(suprastoma) CO₂

(body) (ary-

piglottic fold)⁷⁾

가

(Bilateral vocal - fold immobility)

(arytenoidectomy) 20 Thornell

³³⁾³⁴⁾ 가 CO₂ 가 1972

CO₂ (minimal excision) focused mode
 250 μm
 (: 2~8 W, 0.3~0.8 mm spot size, 0.1~0.5)
 1~2 mm
 31) sli-ghtly defocused mode
 6 가 (Fig. 8).¹²⁾
 CO₂ focused
 defocused mode 3~
 4 (Fig. 9).
 (postoperative care) 2
 proton pump inhibitor 4
 2 가
 가
 1 mm

Table 3. Complications of laser treatment

Complications	Numbers
Endotracheal explosion	28
Laryngeal web	15
Facial burn	9
Pneumothorax	5
Laryngeal stenosis	4
Endotracheal cuff ignition	3
Postoperative hemorrhage	3
Subglottic stenosis	3
Cottonoid ignition	2
Subcutaneous emphysema	2
Laryngeal edema	2
Tracheal stenosis	1
Endotracheal explosion	1
Perichondritis	1
Carbon granuloma	1
Pharyngeal burn	1
Total	81

49/210 physicians (23.3%), Arch Otolaryngol Head Neck Surg 1984 ; 110

가 (Table 3).

cottonid

가

가

27)

1 mm

- 384-8.
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