

Ablation of Diffuse Vocal Cord Papillomatosis Using Digital AcuBlade™ Scanning Micromanipulator and FiberLase™ Flexible CO₂ Laser Fiber in Patient with Major Retrognathia

Case by: Marc Remacle, M.D. | CHU Mont-Godinne, University of Louvain, Belgium

This procedure demanded precision and control. The Digital AcuBlade scanning micromanipulator provides very high degree of both for accessible areas. For areas inaccessible to the DAB, the FiberLase flexible CO₂ laser fiber still enabled a high level of precision and control.

Preoperative

Past Medical History and Presenting Complaint

- › 39 year-old male. Overall state of health was good.
- › Persistent dysphonia
- › History of laryngeal papillomatosis, HPV 6
- › Four prior procedures at another institution

Relevant Physical Findings and Diagnostics

- › Major retrognathia
- › Diffuse papillomatosis involving the 2 vocal folds including the anterior commissure

Diagnosis

- › Diffuse papillomatosis involving both vocal folds including anterior commissure

Operative

Surgical Procedure

- › Because of retrognathia, it was very difficult to expose by direct laryngoscopy with conventional laryngoscopes. Visualization of anterior 1/3 part of vocal folds and of anterior commissure was impossible through the operative microscope.
- › Procedure performed was CO₂ Laser-Assisted Microlaryngoscopy using Digital AcuBlade for posterior and mid-parts of the cords and fiber-delivered CO₂ laser ablation using 30° rigid endoscope visualization for anterior cords and anterior commissure.

Anesthesia

- › Procedure performed under general anesthesia because of the extent of the papillomatosis involving the two cords

Operative

- Laser Accessories**
- › Digital AcuBlade scanning micromanipulator
 - › FiberLase flexible CO₂ laser fiber with 240mm malleable handpiece
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- Smoke Evacuation**
- › Smoke evacuation was not required because of the purge-air flow
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- Laser and Parameters**
- › **Laser System 1:** UltraPulse SurgiTouch Surgical CO₂ Laser System
 - › Laser Operation Mode: **SurgiTouch Scanning Mode**
 - › Control Panel Settings: **ENT, Larynx, Digital AcuBlade 400mm**
 - › Power: **default, 16 Watts**
 - › **Circle shape, 1-2 mm size, scan depth set to 1**
 - › Exposure Mode and Time: **Repeat, 0.1 sec. between scans**
 - › **Laser System #2:** AcuPulse 40WG with FiberLase Flexible CO₂ Laser Fiber
 - › Laser Operation Mode: **SuperPulse, 12 Watts**
 - › Exposure Mode and Time: **Repeat Time ON 0.1 sec., Time OFF 0.1 sec.**
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- Laser Technique**
- › Procedure Part A: Laser System #1 was used to ablate papillomatosis of posterior and mid-parts of vocal cords under microscope visualization
 - › Procedure Part B. Laser System #2 was used to ablate lesions of anterior parts of vocal cords and of anterior commissure under 30° rigid scope visualization. The distance from the tip of the fiber to tissue was 1-2 mm.
 - › The end-point for ablation was when epithelium seemed fully ablated. Char was removed with saline-soaked cottons to ensure there was no remaining epithelium.
 - › Cidofovir injection (7.5 mg/ml) to affected areas at conclusion of procedure
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- Hemostasis**
- › Cautery was available, but was not used.
 - › Hemostasis was accomplished by the laser or cottonoids soaked with saline solution and adrenaline.

Technique Tips

- Avoid Deep Ablation in Reinke's Space**
- › The goal of this surgery was superficial ablation of the epithelium. For controlling the depth of ablation without risk of thermal damage in the Reinke's space, the REPEAT DELAY was used between Digital AcuBlade scans.
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- Minimize Thermal Damage to Mucosa**
- › When using the FiberLase CO₂ laser fiber, REPEAT mode was used to maintain control and minimize thermal trauma to delicate tissues.
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- Visualization**
- › Use saline-soaked cottonoids to periodically wipe away char and permit good assessment of treatment planes. Removal of char also helps minimize thermal build up.

Operative Photos



Fig. 1 Limited visualization of cords through conventional laryngoscope (Remacle model, Wolf©)



Fig. 2 Ablation of posterior parts of vocal cords with Digital AcuBlade scanning micromanipulator (circle)

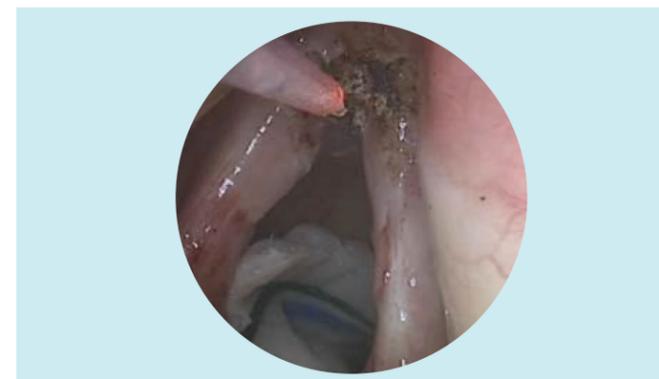


Fig. 3 Ablation of anterior parts of vocal cords and anterior commissure with FiberLase CO₂ waveguide under 30° telescope



Fig. 4 Final view with 30° telescope. Slightly more carbonization occurred with fiber in comparison with AcuBlade, as expected



Fig. 5 Final postoperative view with 70° telescope



Fig. 6 Cidofovir injection

Post-Operative

Discharge and Postoperative Instructions

- › Procedure length was approximately 30 min.
- › Patient was discharged the same day
- › Aerosol therapy with saline solution & voice rest for 10 days
- › Antibiotic therapy for 3 days
- › PPI (pantozole) 40 mg, administered orally, two times per day until healing completed

Recovery and Outcome

- › The patient experienced pain in the throat for 5-6 days
- › The patient has been back once for retreatment. His disease was significantly lessened.
- › The voice was well improved

Discussion

In this patient, surgery was impossible to perform through the microscope. Another fiber –delivered laser wavelength could have been used, but with the CO₂ laser hollow fiber, you really see what you are doing without risk of deep thermal damages – even at the level of the anterior commissure.

Risk Information

CO₂ lasers (10.6 μm wavelength) are intended solely for use by trained physicians. Incorrect treatment settings or misuse of the technology can present risk of serious injury to patient and operating personnel.

The use of Lumenis CO₂ laser is contraindicated where a clinical procedure is limited by anesthesia requirements, site access, or other general operative considerations. Risks may include excessive thermal injury and infection. Read and understand the CO₂ systems and accessories operator manuals for a complete list of intended use, contraindications and risks.



Lumenis Ltd.
 Yokneam Industrial Park,
 6 Hakidma Street
 P.O.B. 240,
 Yokneam 2069204, Israel
 Tel: +972-4-959-9000

EC REP Lumenis (Germany) GmbH
 Heinrich-Hertz-Str 3
 D-63303
 Dreieich-Dreieichenhain
 GERMANY
 Tel: +49 (0) 6103 8335 0

