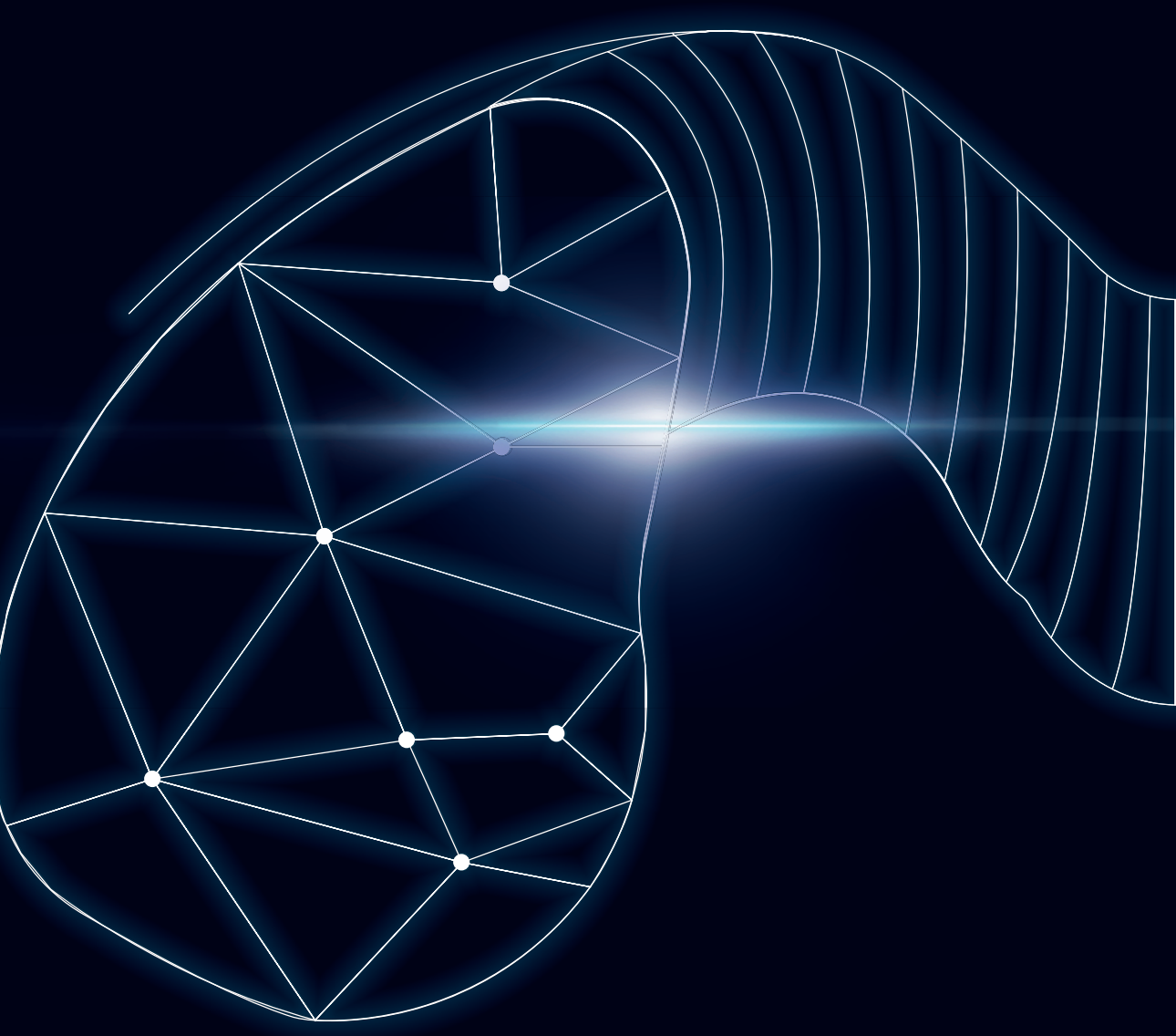
Laser tonsil treatment under local anesthesia: a patient-friendly effective alternative?

Wong Chung, J.E.R.E.



CHAPTER 9

Recommendations for clinical practice, education, future research, and societal impact

This work led to the identification of several recommendations.

Clinical recommendations

***Recommendation**: Consider TO as a first-line surgical option for adults with tonsil-related complaints.*

CO_2-laser TO offers significant advantages over traditional TE including reduced post-operative pain, faster recovery, fewer complications, and lower surgical, medical, and societal costs. This makes it an attractive option for patients seeking a less invasive treatment. Despite concerns about incomplete symptom resolution or recurrence, the current study confirms the long-term (cost-)effectiveness of CO_2-laser TO.

- **Persistent Symptoms**: Patients undergoing TO may report persistent symptoms more often than those undergoing TE, but their symptom severity typically falls below clinically relevant thresholds.
- **Patient Satisfaction**: Both TO and TE show similarly high patient satisfaction in short- and long-term follow-up, thanks to effective symptom reduction and lower morbidity.

***Recommendation:** Select patients carefully to minimize persistent symptoms or re-surgery.*

While many adults with tonsil-related complaints can benefit from a tonsil reduction, CO_2-laser TO may not be suitable for all, as individual factors such as underlying conditions can influence outcomes.

- **Severe tonsillitis**: Individuals with very frequent, severe episodes may be better served by a direct TE to avoid residual, clinically significant symptoms.
- **Patient cooperation**: Non-cooperative patients or those with a significant gag reflex that remains problematic (even after desensitization training as discussed in **Chapter 4**) may require TE under general anesthesia.
- **Malignancy suspicion or peritonsillar abscess**: TO is contraindicated if malignancy is suspected as tissue preservation is necessary for pathological examination. In patients with a history of peritonsillar abscess, TE is given preference over TO, as remaining tissue may lead to recurrence.

Clear information regarding recovery time, risks, and the likelihood of symptom recurrence or need for additional treatment is crucial. The patient's preferences, whether for quicker recovery without general anesthesia with TO, or the higher resolution of symptoms with prolonged and more painful recovery after TE, should guide the discus-

sion. Together, the clinician and patient must weigh the benefits, risks, and individual preferences to reach a shared decision that aligns with the patient's goals.

Recommendation: *Individualize the CO_2-laser TO technique to optimize outcomes.*

Anatomical variability in tonsil size, position and peritonsillar anatomy necessitates precision in treatment to avoid damaging adjacent structures. [1]

- **Complete Tonsillar Exposure**: Use wooden tongue depressors to ensure full visibility, especially important for large lower poles or deeply seated tonsils, to avoid damaging the arches, with subsequent pain and delayed recovery or leaving residual tissue, such as a lower tonsillar pole (**as shown in chapter 4**).
- **Internal carotid artery (ICA) safety margin**: The ICA is normally situated +- 2.5 cm from the base of the tonsils. Anomalies, however, may reduce this distance, increasing the potential for damage and severe arterial bleeding.[2] The tonsillar capsule remains intact in TO, providing an extra protective layer over the internal carotid artery, further reducing bleeding risks.

Recommendations for education

Recommendation: *Include CO_2-laser TO into ENT surgical curriculum.*

Incorporating CO_2-laser TO into the ENT surgical curriculum is important as it provides a valuable alternative to traditional TE. Residents will benefit from learning patient selection criteria, informed consent, and shared decision-making alongside the surgical technique itself for better outcomes and higher patient satisfaction.

- **Informed consent**: Emphasize benefits (lower pain, faster recovery, no general anesthesia, lower overall costs) and risks (persistent complaints, possible retreatment).
- **General knowledge and skills:** Training must emphasize a thorough understanding of tonsil and peritonsillar anatomy for safe and precise CO_2-laser TO. It's essential that training includes proper exposure of the entire tonsil and complete treatment of all lymphatic tonsil tissue to maximize effectiveness and minimize the need for reinterventions.
- **Hands-on training**: Residents should aim to perform at least 15 supervised procedures. Given the steep learning curve, this should ensure sufficient proficiency for safe and effective practice.

Recommendation: *Train current ENT surgeons on diverse tonsillotomy techniques.*

ENT practices use various technologies for local interventions, including CO_2 lasers, blue lasers, diode lasers, KTP lasers, and coblation systems, each with distinct mechanisms of action.

A thorough understanding of their strengths, limitations, and risks is particularly important for tonsillotomy under local anesthesia. For example, CO_2 lasers offer precise control but require more setup and safety measures, while coblation systems are easier to handle but may lack precision and pose risks like fluid or tissue aspiration.

Since many ENT clinics already have these technologies, the initial setup costs and training requirements for implementing tonsillotomy under local anesthesia are lower, making adoption more accessible.

Proper training and familiarity with these systems enable surgeons to make informed, patient-specific choices for safe and effective treatment.

Recommendation: *Develop and disseminate standardized CO_2-laser TO training protocols.*

Structured curricula, including theoretical modules, hands-on workshops, and video tutorials, promote consistent and effective procedures. Given the steep learning curve, structured training will ensure high-quality outcomes across practices.

- **Patient selection:** Emphasize clinical criteria such as frequency and severity of tonsillitis episodes, presence of comorbidities, and patient cooperation. Evaluate gag reflex management, contraindications (e.g., suspected malignancy, peritonsillar abscess), and the likelihood of symptomatic benefit to ensure CO_2-laser TO is appropriate.
- **Procedural Safety**: Thorough practice with tonsil exposure techniques, complete tissue removal, and handling bleeding complications is essential.
- **Video Tutorials**: Resources like the JoVE video protocol (**Chapter 4**) enhance practical learning and support widespread adoption.[3]

RECOMMENDATIONS FOR FUTURE RESEARCH

Recommendation: *Establish a longitudinal tonsil surgery registry.*

By systematically collecting data on long-term outcomes, complications, and surgical techniques, a registry enables evidence-based improvements, validates current findings, and supports their integration into clinical practice, guidelines, and policy decisions.

- **Research Gaps**: Tracking patient data over extended periods helps address questions about symptom recurrence, complications, and comparative effectiveness.

Recommendation: *Conduct large, high-quality randomized controlled trials comparing CO_2-laser TO with other techniques.*

Future research should compare safety, efficacy, and cost-effectiveness across multiple tonsillotomy methods, particularly those feasible under local anesthesia, as they offer a significant advantage over procedures requiring general anesthesia.

- **Existing Infrastructure**: Many clinics already have the necessary equipment, including various laser systems, enabling broader implementation of tonsillotomy without significant new investment. Understanding each device's capabilities and limitations promotes faster, safer, and more cost-effective adoption of TO. The proposed longitudinal registry would further support research comparing outcomes across different tonsillotomy methods.

Recommendation: *Optimize strategies to minimize the gag reflex.*

Enhancing gag-reflex desensitization can improve patient comfort and accessibility for TO under local anesthesia. Our training protocol, involving daily tongue base and tonsil stimulation with a toothbrush for 14 days, shows promise. Future research should refine this method for greater consistency and effectiveness, benefiting TO and other oropharyngeal procedures.

RECOMMENDATIONS FOR SOCIETAL IMPACT

Recommendation: *Advocate for CO_2-laser TO inclusion in national healthcare guidelines and insurance coverage.*

We advocate for CO_2-laser TO in national healthcare guidelines to improve resource allocation. Its cost-effectiveness stems from shorter recovery, fewer complications, and lower surgical and societal costs. Standardizing its use in care guidelines and insurance coverage can reduce healthcare expenses while enhancing patient outcomes. By eliminating general anesthesia and full surgical theater requirements, CO_2-laser TO reduces patient burden, hospital stays, and costs, while freeing up, the often limited, operating rooms and surgical staff for other procedures.

Recommendation: *Increase public awareness of less invasive surgical alternatives like CO_2-laser TO.*

We recommend public education initiatives to raise awareness of less invasive options like CO_2-laser TO, enabling better-informed decisions and shared decision-making between patients and doctors.

Many patients with chronic tonsil diseases potentially remain undertreated due to the invasiveness of TE, leading to high healthcare costs, societal costs and reduced quality of life. Promoting CO_2-laser TO can help address this gap and lower societal costs associated with these chronic and recurrent conditions.

References

1. Wang J, Chen J, Hu B, Zhao L, Li X. A novel classification and grading scale of palatine tonsil anatomy in children. *Eur Arch Otorhinolaryngol*. 2022;279(12):5921-5928. doi:10.1007/s00405-022-07515-3
2. Alsini AY, Ibrahim A. Pulsating Tonsil Due to Medial Displacement of the Internal Carotid Artery. *Am J Case Rep*. 2017;18:502-506. doi:10.12659/AJCR.902915
3. Wong Chung J, van Helmond N, van Geet R, van Benthem P, Blom H. CO2-Lasertonsillotomy Under Local Anesthesia in Adults. *J Vis Exp*. 2019;(153). doi:10.3791/59702