

Functional Outcomes After Transoral CO2 Laser Surgery for Laryngeal Neoplasms: An Original Clinical Study

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Abstract

Background: Transoral CO2 laser microsurgery (TLM) is an established organ-preserving treatment for laryngeal tumors, with expanding indications in selected locally advanced cases. This study aimed to evaluate patient characteristics, surgical approaches, and postoperative functional outcomes in patients treated with TLM.

Material and Methods: A retrospective analysis was conducted on 137 patients with laryngeal neoplasms treated with transoral CO2 laser surgery between 2022-2025. Demographic information, tumor staging, identified risk factors, and surgical interventions were subject to analysis. Functional outcomes were evaluated through the Voice Handicap Index-10 (VHI-10), Eating Assessment Tool-10 (EAT-10), and Functional Oral Intake Scale (FOIS). Inclusion of specific T3 tumors was determined by established clinical and radiological guidelines. Descriptive statistics and chi-square tests were employed, with a significance threshold established at $p < 0.05$.

Results: The mean age was 68.0 ± 10.3 years, with a slight male predominance (53.3%). Early and intermediate tumors, classified as T1-T2, made up 78.1% of the cases. In contrast, the remaining 21.9% of the cases were attributed to selected T3 tumors. Tobacco use was reported in 66.4% of patients and alcohol consumption in 47.4%. HPV positivity was identified in 17.5% of cases. Most patients underwent ELS type I–IV cordectomies. In the early stages of tumor development, positive voice outcomes were observed, whereas higher VHI-10 scores were seen in some T3 lesions. Most patients maintained their swallowing function; however, clinically significant dysphagia was found in 20.0% of the selected T3 tumors and 13.3% of supraglottic tumors. During follow-up, most patients reached FOIS levels of 6–7.

Conclusions: Transoral CO2 laser surgery is an effective organ-preserving treatment for laryngeal neoplasms, providing excellent functional outcomes in early-stage tumors and acceptable results in selected T3 lesions. Careful patient selection and appropriate surgical technique are essential to optimize outcomes.

Keywords: transoral laser microsurgery, laryngeal cancer, cordectomy, voice outcomes, swallowing function