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# Efficacy and safety of CO 2 laser surgery for laryngeal cancer: a meta-analysis

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**ADMINISTRATIVE INFORMATION**

**Support -** None.

**Review Stage at time of this submission -** Preliminary searches.

**Conflicts of interest -** None declared.

**INPLASY registration number:** INPLASY202380035

**Amendments -** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 August 2023 and was last updated on 09 August 2023.

## INTRODUCTION

**Review question / Objective** Comparing the efficacy and safety of co2 laser surgery with other treatment modalities in a randomized controlled trial for patients with laryngeal cancer.

**Condition being studied** Head and neck cancer (HNC) includes oral cavity cancer (OCC), pharyngeal cancer (PC), and laryngeal cancer (LC) [1], with OCC and PC together being the sixth most common cancers in the world [2]. An epidemiologic survey of lip, oral cavity, and pharyngeal (LOCP) cancers in the United States showed an upward trend in mortality for LC (APC = 3.2; 95% CI: 1.7, 4.8) [3]. An epidemiological survey from 72 tumor registries in China showed that the incidence rate of OCC and LC was 3.28/100,000, and the mortality rate was 1.37/100,000.As a common malignant tumor in otorhinolaryngology-head and neck surgery, the etiology of LC is currently thought to be related to dietary, environmental, alcoholic, tobacco, and [4] occupational exposure risk factors [5], with dietary factors LC can be categorized into supraglottic, glottic and subglottic cancers according to the site of development, of which glottic cancer accounts for 60% of all laryngeal cancers and is the most common, while subglottic cancers are less common Finding rational and effective treatments is a major challenge that clinicians need to face [7, 8].
Translated with http://www.DeepL.com/Translator (free version).

## METHODS

**Participant or population** All patients with a definite diagnosis of laryngeal cancer.

**Intervention** Patients with laryngeal cancer in the experimental group were treated with co2 laser surgery, and those in the control group were treated with modalities other than co2 laser surgery.

**Comparator** Patients with laryngeal cancer in the experimental group were treated with co2 laser

surgery, and those in the control group were treated with modalities other than co2 laser surgery.

**Study designs to be included** The type of literature for this study was publicly available controlled trials in any language. Clinical studies that contained summaries of sufficient data for analysis but did not publish full information were also included in this analysis. Both blinded and unblinded trials were included in this analysis.

**Eligibility criteria** The exclusion criteria for this study were (1) duplicate publications, (2) identical publications by the same subject group, (3) conference abstracts, case studies, or publications that did not report relevant data, (4) publications with incompatible research objectives, and (5) publications for which the original text was not available.

**Information sources** We were prepared to search PubMed, Embase, and Web of science databases with no language restrictions. We searched the databases for combinations of indexed and free text terms, including "carbon dioxide laser surgery" "pharyngeal cancer". We modify the search terms each database restriction. See Appendix 1, Appendix 2, and Appendix 3 for search strategies.
We also talk about browsing the references of classic review articles and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP; apps.who.int/trialsearch/) to try to add to the study.

**Main outcome(s)** The primary outcome indicators were recurrence rate, quality of articulation at 3 months postoperatively, which was assessed by 3 indicators: fundamental frequency perturbation, amplitude perturbation, and harmonic-to-noise ratio; and secondary indicators: postoperative mucosal recovery, and duration of surgery.

**Quality assessment / Risk of bias analysis**
Sensitivity analysis and subgroup analysis
Sensitivity analysis is used to assess whether the statistical results are stable or not through article-by-article exclusion. Subgroup analysis is mainly used to find the source of heterogeneity among studies.
Egger's test
Meta-analysis and Egger's test were performed by using RevMan 5.3 software. p0.05 suggests no significant publication bias.

**Strategy of data synthesis** Data were analyzed using RevMan software (version 5.4, Cochrane Collaboration). Pain scores (VAS or NRS) were expressed as Mean Difference (MD) for continuous variables, and the incidence of adverse events was expressed as Relative Ratios (RR) for dichotomous variables, which were statistically assessed using a 95% Confidence Interval (CI), with a difference of $P < 0.05$ being statistically significant. 0.05 was considered statistically significant. Heterogeneity of the study results was examined using the chi-square test at a level of $P = 0.1$; if $P \leq 0.1$ and $I2 > 50\%$ indicated that there was significant heterogeneity among the data, the random effects model was used; on the contrary, if $P > 0.1$ and $I2 \leq 50\%$ indicated that the heterogeneity was not significant or there was no heterogeneity, the fixed effects model was used. On the other hand, if $P > 0.1$ and $I2 \leq 50\%$ indicating insignificant heterogeneity or no heterogeneity, the fixed effects model was used.

**Subgroup analysis** Subgroup analysis of sex, age, weight, and previous treatment history for our proposed study.

**Sensitivity analysis** Sensitivity analyses were conducted to assess the stability of the statistical results by means of article-by-article exclusion and change-effects modeling.

**Country(ies) involved** China.

**Keywords** Efficacy; safety; meta-analysis; carbon dioxide laser surgery; laryngeal cancer.

**Contributions of each author**
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