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**Evidence-Based Series 5-2 Version 2**

A Quality Initiative of the
Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

# The Role of Endolaryngeal Surgery (With or Without Laser) versus Radiotherapy in the Management of Early (T1) Glottic Cancer

*Members of the Head and Neck Cancer Guideline Development Group*

**October 16, 2023**

**An assessment conducted in November 2025 deferred the review of Evidence-Based Series (EBS) 5-2 Version 2. This means that the document remains current until it is assessed again next year. The PEBC has a formal and standardized process to ensure the currency of each document (PEBC Assessment & Review Protocol)**

**EBS 5-2 is comprised of 4 sections. You can access the summary and full report here: https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/521**



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## Guideline Report History

| GUIDELINE VERSION | SYSTEMATIC REVIEW *Search Dates* | SYSTEMATIC REVIEW *Data* | PUBLICATIONS | NOTES AND KEY CHANGES |
|---|---|---|---|---|
| Original version March 14, 2012 | 1996 to 2011 | Full Report | Web publication Head Neck 2014 Curr Oncol 2013 | NA |
| Current Version 2 October 16, 2023 | 2011 to 2022 | New data found in Section 4: Document Assessment and Review | Updated Web publication | 2012 recommendations are **ENDORSED** |

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**Evidence-Based Series 5-2: Section 1**

# The Role of Endolaryngeal Surgery (With or Without Laser) versus Radiotherapy in the Management of Early (T1) Glottic Cancer: Guideline Recommendations

**QUESTION**

In patients with early (T1) glottic cancer, what is the role of endolaryngeal surgery (with or without laser) versus radiation therapy, in terms of survival, locoregional control, laryngeal preservation rates and voice outcomes?

**TARGET POPULATION**

The target population of this guideline is adult patients with previously untreated early (T1) glottic cancers.

**INTENDED USERS**

This guideline is intended for use by clinicians and healthcare providers involved in the management or referral of adult patients with early (T1) glottic cancer.

**RECOMMENDATION**

For patients with early (T1) glottic cancer, recommended treatment options include the equally effective endolaryngeal surgery, with or without laser, or radiation therapy. The choice between treatment modalities should be based on patient and clinician preferences and general medical condition.

***October 2023: It is the opinion of the Head and Neck Cancer Guideline Development Expert Panel that the following statement be added:***

***For patients in the T1a subgroup, treatment with surgery is preferred.***

***See Section 4 for details.***

**QUALIFYING STATEMENT**

There is currently no well-designed, prospective, randomized controlled trial (RCT) that compares endolaryngeal surgery and radiation therapy. Thus, these recommendations are based primarily on other comparative study designs. Although not substantiated by the evidence, several factors are important considerations when deciding between surgery and radiotherapy for early glottic cancer. Location of disease is one factor. Anterior commissure involvement may be a factor that favours a recommendation of radiotherapy over surgery due to a common opinion that voice outcomes are particularly affected. Tumours localized to the midportion of the vocal fold, and where endoscopic accessibility is uncompromised, may be

considered ideal candidates for surgery. Other important practical considerations include the ability for patients to tolerate a general anaesthetic, which is required for surgery. In contrast, radiotherapy requires patient cooperation for daily treatment for four to six weeks. Partial laryngeal surgery, including revision endoscopic surgery, is possible for local recurrence following surgery. However, re-irradiation is not an option in cases of recurrence.

**KEY EVIDENCE**

There is a lack of high-quality evidence to explicitly inform the guideline question. Notwithstanding, the recommendation is based on the best available evidence and a consensus of expert clinical opinion of the Head and Neck Cancer Disease Site Group (DSG).

One meta-analysis, fifteen cohort studies and two cross-sectional studies comparing endolaryngeal surgery (with or without laser) to radiation therapy in patients with early glottic cancer comprised the evidence base.

- No statistically significant differences in overall survival or disease–free survival were detected. One retrospective cohort study (1) did report a significant (p=0.003) 15-year cause-specific survival benefit in surgically treated patients (100%) over those treated with radiation therapy (91%). This result was not consistent with four other retrospective cohort studies (2,3-5) that also considered cause-specific mortality and showed no significant differences. The meta-analysis [6] detected no statistically significant laryngectomy-free survival benefits associated with laser surgery when compared to radiation therapy (odds ratio [OR], 0.73; 95% confidence interval [CI], 0.39-1.35).
- One meta-analysis (6) found no statistically significant difference in local control between radiation therapy and laser surgery (OR, 0.66; 95% CI, 0.41 to 1.05). One (7) of eight retrospective cohort studies reported a marginally significant better control rate in surgically treated patients (89%) over those treated with radiotherapy (75%) when only T1a patients were considered (p=0.05). One retrospective cohort study [1] also reported a significant difference in recurrence rates favouring surgery. Thurnher et al (1) found a recurrence rate of 30.5% in those undergoing radiation therapy versus 9.9% in the patients treated with laser excision (p=0.001). The remaining five studies did not report any such significant differences in recurrence rates between treatment groups.
- Laryngeal preservation rates were found to be better with surgery, (with or without laser) as compared to radiation in five studies (1,5,7-9), while one study found a marginally significant better preservation rate with radiation therapy (p=0.051) (10).
- Post-treatment voice and speech quality was assessed by clinician perceptual analysis in one retrospective cohort study (11), which found that the difference between radiation therapy patients and those treated surgically did not reach statistical significance. In five studies that analyzed patient self-perception, three (12-14) found no statistically significant difference between treatment groups, one (15) found radiation therapy patients scored significantly better, and one (16) study reported surgically treated patients scored better. One meta-analysis (6) found conflicting results. It detected significantly better maximum phonation time and fundamental frequency in the radiation therapy patients but reported that the perturbation measures of jitter and shimmer significantly favoured the patients undergoing transoral laser surgery.

**FUTURE RESEARCH**

Carcinoma of the glottis is usually diagnosed in the early phase, and both modalities of treatment have shown high cure rates. However, controversies in the treatment of early glottic cancer remain because of the lack of high-quality prospective analyses comparing endoscopic

surgery versus radiotherapy. There is no evidence in favour of one treatment modality when considering the likelihood of local control or overall survival. There is a suggestion that radiotherapy may be associated with less measureable perturbation of voice as compared to surgery but no significant differences were seen in patient perception. The likelihood of laryngeal preservation may be higher when surgery can be offered as initial treatment. Future research should focus on conducting RCTs or prospective comparative studies, with ample follow-up time, that focus on functional outcomes of patients with early glottic cancer.

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## REFERENCES


1. Thurnher D, Erovic BM, Frommlet F, Brannath W, Ehrenberger K, Jansen B, et al. Challenging a dogma-surgery yields superior long-term results for T1a squamous cell carcinoma of the glottic larynx compared to radiotherapy. Eur J Surg Oncol. 2008;34(6):692-8.
2. Mahler V, Boysen M, Brondbo K. Radiotherapy or CO2 laser surgery as treatment of T1a glottic carcinoma? Eur Arch Otorhinolaryngol. 2010;267:743-50.
3. Brandenburg JH. Laser cordotomy versus radiotherapy: an objective cost analysis. Ann Otol Rhinol Laryngol. 2001;110 (4):312-8.
4. Bron LP, Soldati D, Zouhair A, Ozsahin M, Brossard E, Monnier P, et al. Treatment of early stage squamous-cell carcinoma of the glottic larynx: endoscopic surgery or cricohyoidoepiglottopexy versus radiotherapy. Head Neck. 2001;23(10):823-9.
5. Stoeckli SJ, Schnieper I, Huguenin P, Schmid S. Early glottic carcinoma: treatment according patient's preference? Head Neck. 2003;25(12):1051-6.
6. Higgins KM, Shah MD, Ogaick MJ, Enepekides D. Treatment of early-stage glottic cancer: meta-analysis comparison of laser excision versus radiotherapy. J Otolaryngol Head Neck Surg. 2009;38(06):603-12.
7. Sjogren EV, Langeveld TPM, Baatenburg de Jong RJ. Clinical outcome of T1 glottic carcinoma since the introduction of endoscopic CO2 laser surgery as treatment option. Head Neck. 2008;30(9):1167-74.
8. Kujath M, Kerr P, Myers C, Bammeke F, Lambert P, Cooke A, et al. Functional outcomes and laryngectomy-free survival after transoral CO2 laser microsurgery for stage 1 and 2 glottic carcinoma. J Otolaryngol Head Neck Surg. 2011;40 Suppl 1:S49-S58.
9. Schrijvers ML, van Riel EL, Langendijk JA, Dikkers FG, Schuuring E, van der Wal JE, et al. Higher laryngeal preservation rate after CO2 laser surgery compared with radiotherapy in T1a glottic laryngeal carcinoma. Head Neck. 2009;31(6):759-64.
10. Foote RL, Buskirk SJ, Grado GL, Bonner JA. Has radiotherapy become too expensive to be considered a treatment option for early glottic cancer? Head Neck. 1997;19:692-700.
11. Rosier JF, Gregoire V, Counoy H, Octave-Prignot M, Rombaut P, Scalliet P, et al. Comparison of external radiotherapy, laser microsurgery and partial laryngectomy for the treatment of T1N0M0 glottic carcinomas: a retrospective evaluation. Radiother Oncol. 1998;48(2):175-83.
12. Smith JC, Johnson JT, Cognetti DM, Landsittel DP, Gooding WE, Cano ER, et al. Quality of life, functional outcome, and costs of early glottic cancer. Laryngoscope. 2003;113(1):68-76.
13. Osborn HA, Hu A, Venkatesan V, Nichols A, Franklin JH, Yoo JH, et al. Comparison of endoscopic laser resection versus radiation therapy for the treatment of early glottic carcinoma. J Otolaryngol Head Neck Surg. 2011;40(3):200-4.
14. Oridate N, Homma A, Suzuki S, Nakamaru Y, Suzuki F, Hatakeyama H, et al. Voice-related quality of life after treatment of laryngeal cancer. Arch Otolaryngol Head Neck Surg. 2009;135(4):363-8.
15. Dinapoli N, Parrilla C, Galli J, Autorino R, Micciche F, Bussu F, et al. Multidisciplinary approach in the treatment of T1 glottic cancer. The role of patient preference in a homogenous patient population. Strahlentherapie und Onkologie. 2010;186(11):607-13.
16. Peeters AJ, van Gogh CD, Goor KM, Verdonck-de Leeuw IM, Langendijk JA, Mahieu HF. Health status and voice outcome after treatment for T1a glottic carcinoma. Eur Arch Otorhinolaryngol. 2004;261:534-40.