

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
1. Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A. editors. <i>AJCC cancer staging manual</i> . 7th ed. New York: Springer; 2010:57-67.	15	N/A	Editorial to summarize the background of the current revision and outline the major issues revised.	The 7th edition is a springboard to the exciting future of personalized cancer care using data to more specifically define prognosis and the potential for benefit from specific therapies. The AJCC will lead the charge to bring scientific advances to broad clinical use to provide these advantages to all cancer patients worldwide.	4
2. Groome PA, O'Sullivan B, Irish JC, et al. Glottic cancer in Ontario, Canada and the SEER areas of the United States. Do different management philosophies produce different outcome profiles? <i>J Clin Epidemiol</i> 2001; 54(3):301-315.	4	From Ontario: 3,295 patients, SEER: 3,921 patients	To compare the management and outcome of glottic cancer in Ontario, Canada to that in the Surveillance, Epidemiology and End Results (SEER) Program areas in the U.S. to determine whether the greater use of primary RT with surgery reserved for salvage in Ontario is associated with similar survival and better larynx retention rates than the U.S. approach where primary surgery is used more often.	In localized disease (T1 or T2), conservative treatment was the most common initial treatment in both regions, although total laryngectomy was used more often in SEER than Ontario (6.2% vs 0.2%, respectively, $P < .001$ ). In advanced disease (T3 or T4), total laryngectomy was more commonly used as initial treatment in SEER (62.9% vs 21.0% in Ontario, $P \leq .001$ ). Over all cases, the relative survival rate was 80% in Ontario at 5 years compared to 78% in SEER ( $P = .33$ ). In localized disease, the relative survival rates were 4% to 5% higher in Ontario from the second year on; while in advanced disease 2% to 3% higher rates in SEER did not approach statistical significance.	2
3. Shah JP, Karnell LH, Hoffman HT, et al. Patterns of care for cancer of the larynx in the United States. <i>Arch Otolaryngol Head Neck Surg</i> 1997; 123(5):475-483.	3a	16,936 consecutive patients	To assess case-mix characteristics, treatment patterns, and outcomes for laryngeal cancer using the largest series of patients to date.	There was a slight increase across these years in stage IV disease and in RT (with or without surgery and/or chemotherapy). Overall diversity of management of this disease (by site and stage) was apparent. 5-year survival rates indicated a large difference between modified groupings of the T and N classifications, separating stages III and IV cases into localized disease (87.5% for T1-T2; 76.0% for T3-T4 cases) and regional metastasis (46.2%).	2

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4. Pfister DG, Laurie SA, Weinstein GS, et al. American Society of Clinical Oncology clinical practice guideline for the use of larynx-preservation strategies in the treatment of laryngeal cancer. <i>J Clin Oncol</i> 2006; 24(22):3693-3704.	15	N/A	To develop a clinical practice guideline for treatment of laryngeal cancer with the intent of preserving the larynx (either the organ itself or its function). This guideline is intended for use by oncologists in the care of patients outside of clinical trials.	All patients with T1 or T2 laryngeal cancer, with rare exception, should be treated initially with intent to preserve the larynx. For most patients with T3 or T4 disease without tumor invasion through cartilage into soft tissues, a larynx-preservation approach is an appropriate, standard treatment option, and concurrent chemoradiotherapy therapy is the most widely applicable approach.	4
5. Dey P, Arnold D, Wight R, MacKenzie K, Kelly C, Wilson J. Radiotherapy versus open surgery versus endolaryngeal surgery (with or without laser) for early laryngeal squamous cell cancer. <i>Cochrane Database Syst Rev</i> 2002; (2):CD002027.	7	N/A	To compare the effectiveness of open surgery, endolaryngeal excision (with or without laser) and RT in the management of early glottic laryngeal cancer.	There is currently insufficient evidence to guide management decisions on the most effective treatment. Interpretation of the only large scale randomized control trial comparing open surgery and RT in patients with early glottic cancer is limited because of concerns about the adequacy of treatment regimens and deficiencies in the reporting of the study design and analysis. Endolaryngeal resection of early glottic tumors is becoming more common and a well-designed multicenter randomized control trial is warranted.	4
6. Abdurehim Y, Hua Z, Yasin Y, Xukurhan A, Imam I, Yuqin F. Transoral laser surgery versus radiotherapy: Systematic review and meta-analysis for treatment options of T1a glottic cancer. <i>Head Neck</i> 2011.	7	N/A	To conduct a systematic review and meta-analysis to compare the oncologic and functional outcomes between transoral laser surgery and RT.	No significant differences were identified between transoral laser surgery and RT with respect to LC, OS, disease-specific survival, and post-treatment voice quality. However, larynx preservation was significantly higher in patients initially treated with transoral laser surgery than those initially treated with RT. The approach for optimal treatment of T1a glottic cancer remains unanswered. Properly designed, prospective, randomized, or well-controlled studies will be required.	4

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7. Higgins KM. What treatment for early-stage glottic carcinoma among adult patients: CO2 endolaryngeal laser excision versus standard fractionated external beam radiation is superior in terms of cost utility? <i>Laryngoscope</i> 2011; 121(1):116-134.	7	6 head-to-head comparison studies and 22 consecutive case series	A meta-analysis to determine which treatment for Tis/T1 glottic carcinoma among adult patients, transoral CO(2) laser excision vs EBRT, is superior in terms of cost utility.	There were no significant differences between transoral CO(2) laser excision surgery and EBRT with respect to LC (OR, 0.81; 95% CI, 0.51-1.3) and laryngectomy-free survival (OR, 0.84, 95% CI, 0.42-1.66). The weighted mean difference for OS was 0.03. There were no objective differences for measures of voice quality. Decision-tree analysis was undertaken using mean 5-year LC initial probabilities. CO(2) laser cost \$2475.65/case (US \$2407.32/case), generating 1.663 quality adjusted life years, whereas radiation cost \$4965.85/case (US \$4828.79/case), generating 1.506 quality adjusted life years. This contrasts initial upstream costs for CO(2) laser (~\$1889/case, ~US \$1836.86/case) and RT (~\$2454.70/case, ~US \$2386.95/case).	2
8. Hartl DM, Ferlito A, Brasnu DF, et al. Evidence-based review of treatment options for patients with glottic cancer. <i>Head Neck</i> 2011; 33(11):1638-1648.	15	N/A	To evaluate the current levels of evidence for glottic SCC (Current guidelines for early stage glottic cancer are based on low-level evidence).	Conservation surgery (open or transoral) and RT are all valid options for T1 and selected T2 lesions. For advanced lesions, surgery and combined chemotherapy and radiation are options. High-level evidence favors combined chemotherapy and RT or altered fractionation RT as nonsurgical strategies for organ preservation, compared with RT alone. The optimal combination of chemotherapy, targeted therapy, and RT remains to be demonstrated, however, and for high-volume tumors, total laryngectomy may still be warranted.	4
9. Hartl DM, Brasnu DF. Chemotherapy alone for glottic carcinoma: a need for higher-level evidence. <i>Ann Otol Rhinol Laryngol</i> 2009; 118(8):543-545.	7	6 published studies of exclusive chemotherapy	To review the data to evaluate the evidence for routine use of exclusive chemotherapy for laryngeal carcinoma.	The 5-year actuarial LC rate with chemotherapy alone ranged from 53.7% (laryngeal and hypopharyngeal cancers, T1 to T4) to 91% (larynx only). Between 6% and 33% of the cases initially treated with induction chemotherapy were, after selection of the complete responders, locally controlled by exclusive chemotherapy. That is, for every 1 case locally controlled by exclusive chemotherapy, 3 to 17 cases had to be treated initially with induction chemotherapy. No chemotherapy-related deaths occurred in any of the studies.	4

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10. Cellai E, Chiavacci A, Olmi P. Causes of failure of curative radiation therapy in 205 early glottic cancers. <i>Int J Radiat Oncol Biol Phys</i> 1990; 19(5):1139-1142.	4	205	A retrospective analysis of the results obtained with curative RT in a series of 205 patients affected by early glottic cancer treated from 1970 to 1985 at the Florence University and Hospital Departments of Radiotherapy is presented.	All patients were staged according to TNM System (UICC 1978) as T1-T2 NO. The overall 5-year LC rates were 88% for T1a, 75% for T1b, and 64 for T2. The main cause of failure was progression or recurrence in T (41/48); five failures were observed in T and N at the same time and two in N. Of these 48 patients, 21 (44%) were salvaged with surgery. After surgical salvage of radiation failures, the 5-year survival rates were 95%, 91%, and 73%, respectively, for T1a, T1b, and T2. The extent of T and the number of subsites involved significantly affected LC. Vocal cord mobility was less important. The incidence of failures and damages was analyzed according to the radiation beam, the size of the irradiated volume, fractionation, and total tumor dose.	4
11. Harwood AR, Hawkins NV, Rider WD, Bryce DP. Radiotherapy of early glottic cancer--I. <i>Int J Radiat Oncol Biol Phys</i> 1979; 5(4):473-476.	4	378	A detailed, retrospective analysis of the results of treatment of 378 patients with early glottic cancer seen at Princess Margaret Hospital from 1965-1974.	There were 378 patients in the study, 45 stage T1sNOMO, 283 T1aNOMO, and 50 T1bNOMO. There is little difference in local recurrence rate between the T1a and T1b cases (13% and 18%, respectively) and with the numbers available this was not statistically significant (P=0.287). The local recurrence rate for T1a and T1b for the years 1965 to 1969 was 18% and for the years 1970-74, 9%, (this difference is statistically significant P=0.007). Comparison was made between the survival of each stage grouping of patients cured of their tumor and the normal survival curve for a similar group of patients of the same age and sex distribution and no difference was found.	4
12. Harwood AR, Tierie A. Radiotherapy of early glottic cancer--II. <i>Int J Radiat Oncol Biol Phys</i> 1979; 5(4):477-482.	4	204	Provides information on the LC, survival and complication rates for treatment of patients with early glottic carcinoma (detailed retrospective analysis of the results and complications from the series at the Netherland's Cancer Institute).	The crude survival for the T1sNOMO patients was 100% at 3 years and 44% at 5 years (the fall off resulted from the effect of intercurrent deaths in a small number of patients followed out to 5 years): the corrected actuarial survival was 100% at 3 years and 90% at 5 years, with only one patient dying of recurrence of tumor at 3 years. No difference in corrected actuarial survival was seen between T1a and T1b patients at 3 years (91% and 89%, respectively) and 5 years (87% and 89%, respectively).	4

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13. Teshima T, Chatani M, Inoue T. Radiation therapy for early glottic cancer (T1N0M0): II. Prospective randomized study concerning radiation field. <i>Int J Radiat Oncol Biol Phys</i> 1990; 18(1):119-123.	1	87	A prospective randomized study to determine the effect of radiation field on the LC of early glottic cancer was performed. From May 1982 through December 1985, a total of 87 patients with early glottic cancer (T1N0M0) were treated with an individualized wedge filter technique using a shell to improve the dose distribution and immobilization during RT with 4 MV X-ray.	The 3-year recurrence-free survival rates were 93% in group A and 96% in group B (no significant difference). Comparison with historical control showed that both arms achieved better results. These results were mainly due to the improved LC of whole-length lesions of single vocal cords. Acute mucosal reaction ( $P<0.05$ ) and persistent arytenoid edema lasting more than 6 months ( $P<0.02$ ) were more frequently observed in group B than in group A.	1
14. Le QT, Fu KK, Kroll S, et al. Influence of fraction size, total dose, and overall time on local control of T1-T2 glottic carcinoma. <i>Int J Radiat Oncol Biol Phys</i> 1997; 39(1):115-126.	3a	398 consecutive patients	To evaluate the influence of fraction size, overall time, total dose, and other prognostic factors on LC of T1 and T2 glottic carcinomas.	Median follow-up of all alive patients was 116 months (range 3-436 months). 5-year LC was 85% for T1 and 70% for T2 glottic carcinomas ( $P=0.0004$ ). The severe complication rate for the entire group was low: 1.8%. Total dose, fraction size, and overall time were significant factors for LC of T2 but not T1 glottic carcinomas. Anterior commissure involvement was associated with decreased LC for T1 but not T2 lesions. For T1 lesions, LC improved over the treatment era. For T2 lesions, LC decreased with impaired cord mobility and subglottic extension.	2
15. Fein DA, Lee WR, Hanlon AL, Ridge JA, Curran WJ, Coia LR. Do overall treatment time, field size, and treatment energy influence local control of T1-T2 squamous cell carcinomas of the glottic larynx? <i>Int J Radiat Oncol Biol Phys</i> 1996; 34(4):823-831.	3a	109 patients	To evaluate treatment and patient related prognostic factors that may influence LC in the treatment of T1-T2 SCC of the glottic larynx.	The 2-year LC rates for patients with T1 and T2 lesions were 89% and 80%, respectively. The 2-year LC rate for patients whose overall treatment time was <50 days was 92% vs 82% for patients whose overall treatment time was >50 days ( $P=0.07$ ). The 2-year LC rate for patients treated with an irradiated area <36 cm <sup>2</sup> was 90% compared to 86% in patients who were treated to an area ≥36 cm <sup>2</sup> . The 2-year LC rate for patients treated with 60Co was 83% vs 92% for patients treated with 6 MV x-ray. Overall treatment time ( $P=0.05$ ) was the only variable that significantly influenced LC.	2

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16. Yamazaki H, Nishiyama K, Tanaka E, Koizumi M, Chatani M. Radiotherapy for early glottic carcinoma (T1N0M0): results of prospective randomized study of radiation fraction size and overall treatment time. <i>Int J Radiat Oncol Biol Phys</i> 2006; 64(1):77-82.	1	180 patients	To investigate in a prospective randomized study the effect of radiation fraction size and overall treatment time on the LC of early glottic carcinoma.	The 5-year LC rate was 77% for Arm A and 92% for Arm B (P=0.004). The corresponding 5-year cause-specific survival rates were 97% and 100% (no significant difference). No significant differences were found between these two arms in terms of rates of acute mucosal reaction, skin reactions, or chronic adverse reactions. Use of 2.25 Gy fractions with a shorter overall treatment time for Arm B showed superior LC compared with conventional use of 2 Gy fractions for Arm A without adverse reactions from the greater fraction.	1
17. Chera BS, Amdur RJ, Morris CG, Kirwan JM, Mendenhall WM. T1N0 to T2N0 squamous cell carcinoma of the glottic larynx treated with definitive radiotherapy. <i>Int J Radiat Oncol Biol Phys</i> 2010; 78(2):461-466.	4	585 patients	Retrospective review to report the treatment outcomes of definitive RT for early-stage SCC of the glottic larynx.	The median follow-up for survivors was 12 years. 5-year LC rates were as follows: T1A, 94%; T1B, 93%; T2A, 80%; and T2B, 70%. Multivariate analysis revealed that overall treatment time greater than 41 days (P=0.001) and poorly differentiated histology (P=0.016) adversely affected LC. 5-year rates of ultimate LC with laryngeal preservation were: T1A, 95%; T1B, 94%, T2A, 81%; and T2B, 74%. Twenty-four (4%) of 585 patients failed in the neck; only 7 neck failures (1%) were isolated. 5-year cause-specific survival and OS rates were as follows: T1A, 97% and 82%; T1B, 99% and 83%; T2A, 94% and 76%; and T2B, 90% and 78%, respectively. Ten (1.7%) patients had severe and/or fatal complications. One patient died of a radiation-induced carotid artery angiosarcoma. Based on our study results, RT cures a high proportion of patients with T1N0 to T2N0 glottic SCCs and has a low rate of severe complications.	2
18. Cellai E, Frata P, Magrini SM, et al. Radical radiotherapy for early glottic cancer: Results in a series of 1087 patients from two Italian radiation oncology centers. I. The case of T1N0 disease. <i>Int J Radiat Oncol Biol Phys</i> 2005; 63(5):1378-1386.	9	831	To retrospectively evaluate LC rates, late damage incidence, functional results, and second tumor occurrence according to the different patient, tumor, and treatment features in a large bi-institutional series of T1 glottic cancer.	In the entire series, 3-, 5-, and 10-year OS was equal to 86%, 77%, and 57%, respectively. Corresponding values for LC were 86%, 84%, and 83% and for disease-specific survival 96%, 95%, and 93%, taking into account surgical salvage of relapsed cases. 87% of the patients were cured with function preserved.	4

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19. Johansen LV, Overgaard J, Hjelm-Hansen M, Gadeberg CC. Primary radiotherapy of T1 squamous cell carcinoma of the larynx: analysis of 478 patients treated from 1963 to 1985. <i>Int J Radiat Oncol Biol Phys</i> 1990; 18(6):1307-1313.	4	478: 117 supraglottic, 358 glottic, 3 subglottic tumors	Analysis of RT treatment for patients with laryngeal T1 SCC from 1963-1985.	The 10-year value for LC in the supraglottic group was 55% and in the glottic group 81%. No difference was observed between T1a and T1b. Regional nodes and distant metastases were seldom seen in the glottic, but frequently observed in the supraglottic group. The treatment results appeared to be most favorable in women. The 10-year corrected survival for supraglottic and glottic tumors demonstrated a highly significant difference, 67% compared to 94%.	4
20. Mendenhall WM, Amdur RJ, Morris CG, Hinerman RW. T1-T2N0 squamous cell carcinoma of the glottic larynx treated with radiation therapy. <i>J Clin Oncol</i> 2001; 19(20):4029-4036.	7	519	The end results after RT for T1-T2N0 glottic carcinoma vary considerably; this is an analysis of patient-related and treatment-related parameters that may influence the likelihood of cure.	LC rates at 5 years after RT were as follows: T1A, 94%; T1B, 93%; T2A, 80%; and T2B, 72%. Multivariate analysis of LC revealed that the following parameters significantly influenced this end point: overall treatment time (P<.0001), T stage (P=.0003), and histologic differentiation (P=.013). Patients with poorly differentiated cancers fared less well than those with better differentiated lesions. Rates of LC with laryngeal preservation at 5 years were as follows: T1A and T1B, 95%; T2A, 82%; and T2B, 76%. Cause-specific survival rates at 5 years were as follows: T1A and T1B, 98%; T2A, 95%; and T2B, 90%. One patient with a T1N0 cancer and 3 patients with T2N0 lesions experienced severe late radiation complications.	3

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21. Mills EE. Early glottic carcinoma: factors affecting radiation failure, results of treatment and sequelae. <i>Int J Radiat Oncol Biol Phys</i> 1979; 5(6):811-817.	4	101	Retrospective survey of patients with T1, T2 and T3 glottic carcinoma treated over 8 years in the Radiology Department, Groote Schuur Hospital, from 1968 through 1975.	Survival rates of patients who received laryngectomy and primary RT for glottic carcinoma were not significantly different. The ultimate achievement of local disease control will depend on the rate of surgical salvage of radiation failures. In the T1 category, a 90% salvage of 10 radiation failures resulted in loss of local disease control in only 1/48 (2%) patients. The figures for T2 and T3 lesions were 5/29 (17%) and 4/18 (22%) respectively. These results compare favorably with published figures. The DFS is high for 66 patients who were followed for 5 years, whether crude or corrected for age and intercurrent disease, and compares favorably with other published series.	4
22. Dinshaw KA, Sharma V, Agarwal JP, Ghosh S, Havaladar R. Radiation therapy in T1-T2 glottic carcinoma: influence of various treatment parameters on local control/complications. <i>Int J Radiat Oncol Biol Phys</i> 2000; 48(3):723-735.	4	676	To evaluate the influence of various treatment parameters on LC as well as complications in T1 and T2 glottic carcinomas.	The LC at 10 years was 82% and 57% for T1 and T2 lesions respectively (P=0.0). For the T1N0M0 group, field size had significant impact on LC with both univariate (P=0.05) and multivariate (P=0.03) analysis. For T2N0M0, group field size (P=0.03) as well as registration year (P=0.016) were significant in univariate analysis whereas only field size remained significant on multivariate analysis. Persistent radiation edema was noted in 146 (22%) patients and was significantly worse with larger field size (P=0.000) but not related to different treatment regimens.	3

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23. Groome PA, O'Sullivan B, Mackillop WJ, et al. Compromised local control due to treatment interruptions and late treatment breaks in early glottic cancer: Population-based outcomes study supporting need for intensified treatment schedules. <i>Int J Radiat Oncol Biol Phys</i> 2006; 64(4):1002-1012.	4	704: 491 T1N0 and 213 T2N0 patients	To describe the treatment of early glottic cancer in Ontario, Canada and assesses whether treatment variations were associated with treatment effectiveness.	The total dose ranged from 50 to 70 Gy, and the daily dose ranged from 1.9 to 2.8 Gy. In 90%, treatment duration was between 25 and 50 days. Field sizes, field reductions, beam arrangement, and beam energy varied. Late treatment breaks occurred in 13.6% of T1N0 and 27.1% of T2N0 cases. LC was comparable to other reports for T1N0 (82% at 5 years), but was only 63.2% in T2N0. Variables associated with local failure in T1N0 were age <49 years (RR, 3.21; 95% CI; 1.49-6.90) and >3 treatment interruption days (RR, 2.43; 95% CI; 1.00-5.91). In T2N0, these were field reduction (RR, 2.33; 95% CI; 1.23-4.42) and late treatment breaks (RR, 2.19; 95% CI; 1.09-4.41).	3
24. Izuno I, Sone S, Oguchi M, Kiyono K, Takei K. Treatment of early vocal cord carcinoma with 60Co gamma rays, 8/10 MV x-rays, or 4 MV x-rays--are the results different? <i>Acta Oncol</i> 1990; 29(5):637-639.	2	245: All males	Results from RT using a 60Co external beam, 8 or 10 MV photon beams, and a 4 MV photon beam to treat laryngeal carcinoma were studied and compared retrospectively.	No statistically significant differences were found between the survival rates in the 60Co and 8/10 MV groups. The 5-year LC rate was 88% (15/17) in the 60Co group compared to only 60% (15/25) in the 8/10 MV group. Two of the patients in the 60Co group suffered recurrences within 2 years, while two other patients got recurrence after 8 and 9 years. 9 of the patients in the 8/10 MV group suffered recurrences within 3 years, and another 2 patients, after 4.5 and 8 years. One patient in the 4 MV group got recurrence within 6 months. No major complication of RT, such as laryngeal necrosis, was observed in this series.	4

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25. Akine Y, Tokita N, Ogino T, et al. Radiotherapy of T1 glottic cancer with 6 MeV X rays. <i>Int J Radiat Oncol Biol Phys</i> 1991; 20(6):1215-1218.	4	154	The treatment and observed results for 154 patients with T1 glottic carcinoma with 6 MeV X rays through 16 cm <sup>2</sup> parallel-opposing open fields on a free set-up delivering a median dose of 67 Gy in 6 2/3 weeks.	Observed and relative 5-year survival rates for all patients were 87% and 100%, respectively. The LC rate at 5 years was 89%. Of 18 patients who clinically had local recurrence, 17 were salvaged by a secondary treatment. There were no complications requiring medical or surgical attention. A tendency toward increasing LC rates with increasing total doses was observed in the range between 57.5 Gy and 72.5. No significant correlation was found between LC rates and field size, daily dose, or the technique used. A tendency toward a lower LC rate was noted for patients whose anterior commissures were grossly involved; however, it is not known if this could be attributed to the use of 6 MeV X rays. The results are comparable to those obtained with 60Co as reported in the literature.	3
26. Parsons JT, Greene BD, Speer TW, Kirkpatrick SA, Barhorst DB, Yanckowitz T. Treatment of early and moderately advanced vocal cord carcinoma with 6-MV X-rays. <i>Int J Radiat Oncol Biol Phys</i> 2001; 50(4):953-959.	4	83	To analyze the results of irradiation of early and moderately advanced SCC of the true vocal cord treated exclusively with 6-MV X-rays in a community hospital.	LC was achieved in 6 of 6 T1s, 53 of 54 (98%) T1, 8 of 8 T2, and 6 of 6 T3 lesions. No complications were encountered.	3
27. Hardie CL, McKenna A, Przeslak AJ, Morgan DA. Minimising carotid artery dose in the radiotherapy of early glottic cancer. <i>Clin Oncol (R Coll Radiol)</i> 2007; 19(10):800.	5	1 patient	The comparison of two different RT plans for a man with a T1a glottic cancer, as more than 80% of larynx cancers occur in men.	The two beam arrangements did not produce a significant difference in planning target volume coverage and spinal cord exposure remained well with tolerance. However, the mean left and right carotid artery doses in beam arrangement 1 were significantly higher than the mean doses in beam arrangement 2 (38.75 Gy vs 20.10 Gy, P=0.015 and 38.60 Gy vs 21.65 Gy, P=0.029, respectively).	3
28. Foote RL. Radiotherapy alone for early-stage squamous cell carcinoma of the larynx and hypopharynx. <i>Int J Radiat Oncol Biol Phys</i> 2007; 69(2 Suppl):S31-36.	7	N/A	To describe and illustrate examples of early-stage larynx and hypopharynx cancer that can be successfully treated with RT alone.	Early-stage larynx and hypopharynx cancer is defined by tumor extent based on physical and imaging examination.	4

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29. Burke LS, Greven KM, McGuirt WT, Case D, Hoen HM, Raben M. Definitive radiotherapy for early glottic carcinoma: prognostic factors and implications for treatment. <i>Int J Radiat Oncol Biol Phys</i> 1997; 38(5):1001-1006.	7	102	Treatment and disease-related factors were analyzed for their influence on the outcome of patients treated definitively with RT for early glottic carcinoma.	The 5-year LC rates by stage were as follows: T1a, 92%; T1b, 80%; T2a, 94%; and T2b, 23%. By univariate analysis, factors found to have a significant impact on LC were stage, surgical alternative, fraction size, anterior commissure involvement, and overall treatment time. By multivariate analysis, stage, field size, and fraction size were the only significant factors that independently influenced LC.	4
30. Hintz BL, Kagan AR, Wollin M, et al. Local control of T1 vocal cord cancer with radiation therapy: the importance of tumor character vs. treatment parameters. <i>Head Neck Surg</i> 1983; 5(3):204-210.	4	91	The examination and analysis of control of T1 vocal cord cancer with RT: the importance of tumor character vs treatment parameters.	The 5- and 10-year determinate DFS was 80%; the 5- and 10-year determinate survival including surgical salvage was 92%. Tumors involving more than one-half of a vocal cord or involving the anterior commissure or exhibiting an exophytic growth pattern had numerically, but not statistically, higher local failure rates than tumors without these characteristics. Precise radiation treatment technique appears more important for LC (LC) than tumor character. The crucial treatment factors for high LC with few radiation complications are reproducible daily patient positioning, use of contour-compensating devices (wedges), field size of 5 X 5 cm, and a radiation prescription with a time-dose fractionation value of 101 to 106.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
31. Reddy SP, Hong RL, Nagda S, Emami B. Effect of tumor bulk on local control and survival of patients with T1 glottic cancer: a 30-year experience. <i>Int J Radiat Oncol Biol Phys</i> 2007; 69(5):1389-1394.	4	208 patients; 136 with small tumors and 72 with bulky tumors	To evaluate the effect of tumor bulk on LC and survival of patients with T1 glottic cancer.	5-year actuarial LC rates were 86.1% and 91.4% after RT and salvage laryngectomy. On univariate analysis, LC rates were 92.6% and 73.6% for small and bulky tumors (P=0.03), 89.6% and 75.9% for patients without and with anterior-commissure involvement (P=0.01), 92.6% and 75.6% when treatment duration was ≤50 days and >50 days (P=0.04), and 90.2% and 76.4% with 2 Gy and 1.8 Gy (P=0.02) per fraction. On multivariate analysis, tumor bulk was the only significant factor that affected LC (P=0.007). Ultimate LC rates after salvage were 97.1% and 80.5% for patients with small and bulky tumors. DFS rates at 5 years for small and bulky tumors were 96.3% and 84.7% (P=0.001). Median duration to recurrence for small tumors was 30 months as compared with 11 months for bulky tumors.	3
32. van der Voet JC, Keus RB, Hart AA, Hilgers FJ, Bartelink H. The impact of treatment time and smoking on local control and complications in T1 glottic cancer. <i>Int J Radiat Oncol Biol Phys</i> 1998; 42(2):247-255.	2	383	To define the optimal treatment regimen, patients with T1N0M0 glottic larynx carcinoma were treated with six different RT schedules. To assess the influence of patient characteristics, complication rates, and to evaluate the overall larynx preservation.	The overall 5-year actuarial locoregional control was 89%, varying between 83 and 93% for the different schedules. Univariately, LC decreased with increasing treatment time.	2
33. Chera BS, Amdur RJ, Morris CG, Mendenhall WM. Carotid-sparing intensity-modulated radiotherapy for early-stage squamous cell carcinoma of the true vocal cord. <i>Int J Radiat Oncol Biol Phys</i> 2010; 77(5):1380-1385.	5	5 patients simulated	To compare radiation doses to carotid arteries among various RT techniques for treatment of early-stage SCC of the true vocal cords.	Carotid dose was lowest with IMRT. With a bilateral vocal cord target, the median carotid dose was 10 Gy with IMRT vs 25 Gy with 3DCRT and 38 Gy with opposed laterals (P<0.05); with a unilateral target, the median carotid dose was 4 Gy with IMRT vs 19 Gy with 3DCRT and 39 Gy with opposed laterals (P<0.05). The dosimetric tradeoff with IMRT is a small area of high dose in the planning target volumes. The worst heterogeneity results were at a maximum point dose of 80 Gy (127%) in a unilateral target that was close to the carotid. There is no question that IMRT can reduce the dose to the carotid arteries in patients with early-stage vocal cord cancer.	4

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
34. Rosenthal DI, Fuller CD, Barker JL, Jr., et al. Simple carotid-sparing intensity-modulated radiotherapy technique and preliminary experience for T1-2 glottic cancer. <i>Int J Radiat Oncol Biol Phys</i> 2010; 77(2):455-461.	4	11 patients	To investigate the dosimetry and feasibility of carotid-sparing IMRT for early glottic cancer and to report preliminary clinical experience.	IMRT consistently reduced radiation dose to the carotid arteries (P<0.05) while maintaining the clinical target volume coverage. With conventional planning, median carotid V35, V50, and V63 were 100%, 100%, and 69.0%, respectively. With IMRT planning these decreased to 2%, 0%, and 0%, respectively (P<0.01). Radiation planning and treatment times were similar for conventional RT and IMRT. Treatment results have been excellent thus far. IMRT significantly reduced unnecessary radiation dose to the carotid arteries compared with conventional lateral fields while maintaining clinical target volume coverage. Further experience and longer follow-up will be required to demonstrate outcomes for cancer control and carotid artery effects.	3
35. Biel MA. Photodynamic therapy treatment of early oral and laryngeal cancers. <i>Photochem Photobiol</i> 2007; 83(5):1063-1068.	7	N/A	Review of photodynamic therapy treatment of early oral and laryngeal cancers.	Photodynamic therapy has been successfully employed to treat early carcinomas of the oral cavity and larynx preserving normal tissue and vital functions of speech and swallowing. 276 patients with early carcinomas of the oral cavity and larynx were treated from 1990 to 2006. Cure rates with a single treatment for early laryngeal and oral cancers were 91% and 94%, respectively. Photodynamic therapy is an effective primary and alternative treatment modality for early oral cavity and laryngeal cancers.	4
36. Schwartz AW. Dr. Theodor Billroth and the first laryngectomy. <i>Ann Plast Surg</i> 1978; 1(5):513-516.	15	N/A	Historical article.	N/A	4
37. Silver CE, Ferlito A. Conservation Surgery for Glottic Cancer. <i>Surgery for cancer of the larynx and related structures</i> . 2nd ed. Philadelphia: Saunders; 1996:67-121.	15	N/A	Textbook.	N/A	4

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
38. Peretti G, Piazza C, Ansarin M, et al. Transoral CO2 laser microsurgery for Tis-T3 supraglottic squamous cell carcinomas. <i>Eur Arch Otorhinolaryngol</i> 2010; 267(11):1735-1742.	4	80	Patients affected by supraglottic cancer were treated by transoral carbon dioxide laser surgery between 1989 and 2006 in two Italian institutions to assess oncologic outcomes.	The 5-year OS, disease-specific survival and DFS, LC with laser alone, and organ preservation rates calculated by Kaplan-Meier analysis were 84.4%, 97.4%, 88.3%, 96%, and 97.2%, respectively. Univariate analysis showed a statistically significant impact on DFS, LC with laser alone, and organ preservation of pT category (P=0.009, P=0.01, and P=0.03, respectively), while pN category and tumor stage negatively influenced DFS (P=0.007 and P=0.01, respectively). This series confirms the good overall oncologic outcomes obtained by transoral laser surgery for Tis, T1, T2, and selected T3 supraglottic cancer with minimal pre-epiglottic space involvement.	2
39. Motta G, Esposito E, Motta S, Tartaro G, Testa D. CO(2) laser surgery in the treatment of glottic cancer. <i>Head Neck</i> 2005; 27(7):566-573; discussion 573-564.	4	719	To assess the effectiveness of CO(2) laser endoscopic surgery in the treatment of glottic carcinoma limited to the true vocal cords or involving the adjacent regions.	OS, adjusted actuarial survival, and percentage of patients with no evidence of disease at 5 years were 85%, 97%, and 85%, respectively, in patients with T1a disease; 84%, 96%, and 83% in those with T1b disease; 77%, 86%, and 61% in those with T2 unilateral tumors; 77%, 88%, and 55% in those with T2 bilateral tumors; and 64%, 72%, and 60% in those with T3 disease. The statistical analysis showed the following: significant differences in the comparison of T1 vs T2 and T2 vs T3 tumors (P<.01), with the exception of no evidence of disease in the comparison of T2 vs T3 (P>.05); and no significant differences in the comparison of unilateral and bilateral tumors (P>.05). Actuarial LC, actuarial nodal control, and actuarial distant metastasis control at 5 years were 85%, 98%, and 99%, respectively, in patients with T1 disease; and 66%, 82%, and 91% in patients with T2 disease; and 66%, 83%, and 95% in patients with T3 disease. The laryngeal preservation rate was 97.3% in the T1 group, 82.5% in the T2 group, and 80.5% in T3 group.	2

Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
40. Remacle M, Eckel HE, Antonelli A, et al. Endoscopic cordectomy. A proposal for a classification by the Working Committee, European Laryngological Society. <i>Eur Arch Otorhinolaryngol</i> 2000; 257(4):227-231.	15	N/A	The purpose of this proposal of classification was an attempt to reach better consensus amongst clinicians and agree on uniformity in reporting the extent and depth of resection of cordectomy procedures, to allow relevant comparisons within the literature when presenting/publishing the results of surgery, and to recommend the use of guidelines to allow for reproducibility amongst practicing laryngologists.	Lesions originating at the anterior commissure have not been clearly described and, for that reason, a new endoscopic cordectomy (type VI) for cancers of the anterior commissure, which have extended or not to one or both of the vocal folds, without infiltration of the thyroid cartilage is now being proposed by the European Laryngological Society Committee on Nomenclature to revise and complete the initially reported classification.	4
41. Remacle M, Van Haverbeke C, Eckel H, et al. Proposal for revision of the European Laryngological Society classification of endoscopic cordectomies. <i>Eur Arch Otorhinolaryngol</i> 2007; 264(5):499-504.	15	N/A	A classification of different laryngeal endoscopic cordectomies in order to ensure better definitions of postoperative results.	The classification comprises 8 types of cordectomies: 1) a subepithelial cordectomy (type I), which is resection of the epithelium; 2) a subligamental cordectomy (type II), which is a resection of the epithelium, 3) Reinke's space and vocal ligament; transmuscular cordectomy (type III), which proceeds through the vocalis muscle; 4) total cordectomy (type IV); 5) extended cordectomy, which encompasses the contralateral vocal fold and the anterior commissure (type Va); 6) extended cordectomy, which includes the arytenoid (type Vb); 7) extended cordectomy, which encompasses the subglottis (type Vc); and 8) extended cordectomy, which includes the ventricle (type Vd).	4
42. Sjogren EV, van Rossum MA, Langeveld TP, et al. Voice outcome in T1a midcord glottic carcinoma: laser surgery vs radiotherapy. <i>Arch Otolaryngol Head Neck Surg</i> 2008; 134(9):965-972.	3a	Patients after treatment for primary T1a midcord glottic carcinoma with laser surgery (18/23 eligible) or RT (16/18 eligible)	To compare voice quality after RT or endoscopic laser surgery in patients with similar T1a midcord glottic carcinomas according to a validated multidimensional protocol.	Approximately half of the patients had mild to moderate voice dysfunction in the perceptual analysis (53% [8/15] in the RT group and 61% [11/18] in the laser surgery group) and on the Voice Handicap Index (44% [7/16] in the RT group and 56% [10/18] in the laser surgery group). The voice profile in the laser surgery group was mainly breathy; in the RT group, it was equally breathy and rough, with a trend for more jitter in the acoustic analysis. There was no statistical difference in the severity of voice dysfunction between the groups in any of the variables.	3

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
43. Rodel RM, Steiner W, Muller RM, Kron M, Matthias C. Endoscopic laser surgery of early glottic cancer: involvement of the anterior commissure. <i>Head Neck</i> 2009; 31(5):583-592.	4	444 patients	Retrospective review of endoscopic laser surgery of early glottic cancer to evaluate the involvement of the anterior commissure.	The anterior commissure was involved in 153 cases; the 5-year LC rate with and without anterior commissure involvement was 73% vs 89% for T1a and 68% vs 86% for T1b tumors. For T2a lesions, the 5-year LC rate was 76%, irrespective of anterior commissure involvement. In early glottic cancer treated by TLM, a decrease in LC is evident in case of anterior commissure involvement for T1a and T1b but not for T2a tumors.	2

Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
44. Silver CE, Beitler JJ, Shaha AR, Rinaldo A, Ferlito A. Current trends in initial management of laryngeal cancer: the declining use of open surgery. <i>Eur Arch Otorhinolaryngol</i> 2009; 266(9):1333-1352.	7	N/A	Review of current trends in initial management of laryngeal cancer and the declining use of open surgery.	Patients with advanced tumors that responded either partially or completely to chemotherapy were treated with RT, and total laryngectomy was reserved for non-responders. This resulted in the ability to preserve the larynx in a significant number of patients with locally advanced laryngeal cancer, while achieving LC and OS results equivalent to those achieved with initial total laryngectomy. Following this report, similar "organ preservation" protocols were employed in many centers. By 2003, results of the RTOG 93-11 trial, utilizing concomitant chemoradiotherapy as initial treatment, were published, demonstrating a higher rate of laryngeal preservation with this protocol. Surgery was reserved for treatment failures. This concept changed the paradigm for management of advanced laryngeal cancer, greatly reducing the number of laryngectomies performed. While supracricoid laryngectomy has been employed for selected patients, total laryngectomy is the usual procedure for salvage of failure after non-surgical treatment.	4
45. Roh JL, Kim DH, Kim SY, Park CI. Quality of life and voice in patients after laser cordectomy for Tis and T1 glottic carcinomas. <i>Head Neck</i> 2007; 29(11):1010-1016.	3a	75 total patients	To prospectively examine quality of life and vocal function of patients with carcinoma in situ (Tis) or T1 glottic carcinomas after laser cordectomy.	No major complications were encountered, but local recurrence occurred in 10 patients, with group C showing the highest rate (6/19, 31.6%). Patient-reported speech and social contact scores of quality of life questionnaire and VHI scores after surgery were higher in groups B and C than in group A (P<.05). The scores and perceptual and acoustic data were generally improved in all groups after surgery, but were statistically significant only in group A (P<.03). Our data suggest that early glottic cancers with a limited extent and infiltration depth have improved outcomes, both oncologically and functionally, compared to those lesions requiring extensive laser resection.	3

Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
46. Sjogren EV, van Rossum MA, Langeveld TP, Voerman MS, van de Kamp VA, Baatenburg de Jong RJ. Voice profile after type I or II laser chordectomies for T1a glottic carcinoma. <i>Head Neck</i> 2009; 31(11):1502-1510.	4	37 consecutive patients	To evaluate voice after type I or II laser chordectomies for T1a glottis carcinoma.	65% of patients had dysphonia, dominated by mild breathiness (mean grade 1.4). Voice Handicap was minimal (mean VHI 19). Acoustic and aerodynamic parameters were only mildly deviant. The correlations between perceptual analysis and the other parameters were weak. The typical laser treated voice (type I or II resections) is characterized by mild breathiness in perceptual analysis. Correlations with other parameters, including patients' self-assessment, are weak. Therefore, these outcomes do not form one integrated voice profile. This may have consequences for clinical decision-making.	3
47. Vilaseca I, Huerta P, Blanch JL, Fernandez-Planas AM, Jimenez C, Bernal-Sprekelsen M. Voice quality after CO2 laser cordectomy--what can we really expect? <i>Head Neck</i> 2008; 30(1):43-49.	3a	42 consecutive patients	To evaluate the voice quality after laser cordectomy for early glottic cancer in a variety of vocal situations and its relation with the extension of resection and the age.	Grade, roughness, breathiness, asthenicity, strain showed significant differences between patients and controls and correlated with type of cordectomy. Acoustic analysis showed significant differences in fundamental frequency, and jitter, with smaller differences in shimmer, noise to harmonic ratio, and maximum phonation time. Voice quality after laser cordectomy differs from controls, but improves in a majority of patients after the surgery, with almost 50% of patients with subjective normal or near normal voice. Voice quality depends on type of cordectomy.	3
48. Bibby JR, Cotton SM, Perry A, Corry JF. Voice outcomes after radiotherapy treatment for early glottic cancer: assessment using multidimensional tools. <i>Head Neck</i> 2008; 30(5):600-610.	3a	30 patients	Prospective study to use instrumental and both clinician- and client-rated auditory-perceptual measures to examine voice and voice-related quality of life changes in patients after curative RT for early glottic cancer.	Patients' perceptions of their voice quality and their voice-related quality of life significantly improved post treatment, as did acoustic, aerodynamic, and auditory-perceptual voice measures. Mean speaking fundamental frequency did not change significantly, although breathiness and strain in the voice recordings were demonstrably reduced. In describing post RT voices in this study, pertinent measures of voice outcomes have been established, setting the benchmark for comparison in future cohort studies.	3

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
49. Agarwal JP, Baccher GK, Waghmare CM, et al. Factors affecting the quality of voice in the early glottic cancer treated with radiotherapy. <i>Radiother Oncol</i> 2009; 90(2):177-182.	3a	50 patients	To prospectively analyze the objective voice quality before and after RT for early glottic cancer and to evaluate the role of different factors that may affect it.	Following treatment, there was a significant improvement in the majority of measured parameters. However, perturbation and high noise ration remained inferior compared to controls. A history of smoking, anterior commissure involvement and larger RT volumes resulted in poorer voice parameters following RT. There was no significant impact of age alone. T2 tumors had an inferior voice quality before treatment, but did not remain inferior following RT. Hypofractionated RT did not show any negative impact. There is a considerable improvement of voice quality following RT. Several factors may have specific effects on pretreatment and post-treatment voice.	3
50. Hocevar-Boltezar I, Zargi M, Strojjan P. Risk factors for voice quality after radiotherapy for early glottic cancer. <i>Radiother Oncol</i> 2009; 93(3):524-529.	3a	75 patients	To determine the factors influencing voice quality after RT for T1 glottic cancer.	Voice quality was at least slightly abnormal in 94.7% and 81.3% of patients, when assessed perceptively and objectively, respectively. Smoking after the completed treatment, more severe morphologic alterations of the vocal folds, dryness of the throat, incomplete closure of the vocal folds and functional voice disorders expressed as supraglottic activity adversely influenced the voice quality. A good correlation between the perceptive voice assessment and the acoustic analyses was established. After the successful irradiation for T1 glottic carcinoma, the great majority of the patients have at least a slightly hoarse voice. A better voice outcome could be achieved if RT was followed by the patient's cessation of smoking and the appropriate voice therapy.	2

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
51. Smith JC, Johnson JT, Cognetti DM, et al. Quality of life, functional outcome, and costs of early glottic cancer. <i>Laryngoscope</i> 2003; 113(1):68-76.	3a	101 patients	To analyze quality of life, functional outcome, and hidden costs by primary treatment with surgery or RT in patients with early glottic cancer.	Questionnaires were completed in 59% (44/74) of the surgical cohort and 41% (11/27) of the RT cohort. The primary surgical treatments were endoscopic excision (86%), hemilaryngectomy (12%), and total laryngectomy (1%). Patient-reported problems with swallowing, chewing, speech, taste, saliva, pain, activity, recreation, and appearance showed no difference between the endoscopic excision or RT cohorts. Comparing endoscopic excision vs RT, respectively, median number of treatments (2 vs 35), total median travel distance (150 vs 660 miles), total median travel time (180 vs 1,440 min), and total median number of hours of work missed (76 vs 24) all differed significantly (P<.01). Almost all patients with early glottic cancer, whether treated with surgery or RT, reported excellent quality of life outcomes and functional results. In addition to actual costs, the hidden costs for RT vs endoscopic excision were all greater in terms of total number of hours of work missed, total travel time, and total travel distance.	2
52. Ganly I, Patel SG, Matsuo J, et al. Results of surgical salvage after failure of definitive radiation therapy for early-stage squamous cell carcinoma of the glottic larynx. <i>Arch Otolaryngol Head Neck Surg</i> 2006; 132(1):59-66.	4	43 patients	To report the outcome of surgical salvage performed for early-stage SCC of the glottic larynx that recurred or progressed after definitive RT.	No postoperative death occurred following salvage surgery. The overall incidence of complications was 21%, with no difference between the salvage partial laryngectomy and salvage total laryngectomy groups. Patients who required salvage total laryngectomy had poorer OS and disease-specific survival compared with patients who required salvage partial laryngectomy (OS, 50% vs 89%; P=.003; disease-specific survival, 51% vs 93%; P=.002). This difference in survival was associated with a poorer neck recurrence-free survival and distant recurrence-free survival in the salvage total laryngectomy group compared with the salvage partial laryngectomy group (neck recurrence-free survival, 80% vs 100%; P=.04; distant recurrence-free survival, 71% vs 93%; P=.06).	2

Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
53. Holsinger FC, Funk E, Roberts DB, Diaz EM, Jr. Conservation laryngeal surgery versus total laryngectomy for radiation failure in laryngeal cancer. <i>Head Neck</i> 2006; 28(9):779-784.	3a	105 total patients	To compare the efficacy of conservation vs total laryngectomy for salvage of radiation failure in patients who initially presented with T1 or T2 squamous cancer of the larynx.	The median follow-up time after surgery was 69.4 months. In 14 patients, local or regional recurrence developed after salvage surgery: 9 patients after total laryngectomy (12.3%; 9/73), and 5 patients (15.6%; 5/32) after conservation laryngeal surgery. This difference was not statistically significant, nor was there a difference in disease-free interval for the two procedures (P=.634, by log-rank test). Distant metastasis developed in 13 patients. Most developed in the setting of local and/or regional recurrence, but distant metastasis occurred as the only site of failure in 6 of the patients who had undergone total laryngectomy but in one of the conservation surgery patients treated for a supraglottic laryngeal cancer. The overall mortality for patients who underwent total laryngectomy was also higher: 73.74% (54/73) vs 59.4% (19/32) for patients who underwent a conservation approach (P=.011 by log-rank test). Although conservation laryngeal surgery was possible in a few patients with local failure after RT, conservation laryngeal surgery is an oncologically sound alternative to total laryngectomy for these patients.	3
54. Pellini R, Pichi B, Ruscito P, et al. Supracricoid partial laryngectomies after radiation failure: a multi-institutional series. <i>Head Neck</i> 2008; 30(3):372-379.	4	78 consecutive patients	A multi-institutional retrospective analysis of supracricoid partial laryngectomies after radiation failure.	DFS at 3 and 5 years were 95.5%. Early and late postoperative complications occurred in 27% and 17.9% of cases. Decannulation and satisfactory swallowing were achieved in 97.4% of cases. Supracricoid partial laryngectomies represent effective surgical organ-preservation strategies in the treatment of selected recurrences after RT failure, resulting in a good LC as well as functional recovery with acceptable morbidity, despite a complication rate which is not negligible.	3

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
55. Roedel RM, Matthias C, Wolff HA, Schindler P, Aydin T, Christiansen H. Transoral laser microsurgery for recurrence after primary radiotherapy of early glottic cancer. <i>Auris Nasus Larynx</i> 2010; 37(4):474-481.	3a	53 patients	To retrospectively review and analyze oncological results of TLM on recurrent early glottic cancer after primary RT.	Mean post-therapeutic follow-up time after TLM for patients alive was 87.9 months. 22 patients (42%) were cured by the first TLM procedure, but one of them underwent total laryngectomy after TLM due to chondronecrosis without evidence of residual tumor. 31 patients (58%) developed another recurrence after TLM. 10 of them were cured by further laser procedures alone. Therefore, in 31 patients (58%), local recurrences were successfully treated by TLM alone. In 20 patients, recurrences could not be controlled by TLM: 14 patients underwent salvage laryngectomy and six palliative treatment. 3- and 5-year loco-regional control rates for all patients were 46.1% and 38.8%. 3- and 5-year OS rates were 67.5% and 53.3%. The corresponding 3- and 5-year disease specific survival rates were 68.6%, each. There was no statistically significant difference in loco-regional control or survival between patients presenting initially with early and advanced recurrence. Many patients with recurrent glottic carcinoma after primary RT can be cured by single or repeated TLM as an organ-preserving procedure. However, in case of failure after TLM for the first recurrence, salvage laryngectomy should be considered early as LC by further laser surgery is unfavorable.	3

**Treatment of Stage I T1 Glottic Cancer  
EVIDENCE TABLE**

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Strength of Evidence
56. Spayne JA, Warde P, O'Sullivan B, et al. Carcinoma-in-situ of the glottic larynx: results of treatment with radiation therapy. <i>Int J Radiat Oncol Biol Phys</i> 2001; 49(5):1235-1238.	3a	67 patients	To assess the efficacy and safety of a standard RT regimen in the treatment of this condition.	With a median follow-up of 6.5 years, 1 patient developed invasive glottic cancer, giving a 5-year actuarial LC rate of 98%. This patient recurred 14 months after treatment and was salvaged with laryngectomy. He is currently free of disease 2 years after surgery. There were no serious acute or late treatment complications. 16 patients (24%) developed subsequent malignancies, 8 of these being in the upper aerodigestive tract, although none were in the radiation field. Moderate-dose RT is an effective treatment for glottic CIS. It is well tolerated, produces no serious acute or long-term side effects, with an excellent cure rate.	3
57. Mahler V, Boysen M, Brondbo K. Radiotherapy or CO(2) laser surgery as treatment of T(1a) glottic carcinoma? <i>Eur Arch Otorhinolaryngol</i> 2010; 267(5):743-750.	3a	351 patients	To compare the outcome of RT and laser surgery in the treatment of T(1a) glottic carcinoma.	The minimum follow-up time was 29 months. Neither the estimated 5-year DFS, the disease-specific survival nor the crude survival differs between the two treatment options. The incidence of mainly local recurrences was equal during the first 3 years, followed by an increase in number of recurrences in the laser-operated patients. The OR for a laryngectomy was 13.5 in patients treated with RT (P=0.002), but mortality due to recurrence did not differ between the groups. The incidence of second primaries was equal (11%) but death due to second primaries differed significantly, favoring laser-treated patients (P=0.003).	2
58. Schrijvers ML, van Riel EL, Langendijk JA, et al. Higher laryngeal preservation rate after CO2 laser surgery compared with radiotherapy in T1a glottic laryngeal carcinoma. <i>Head Neck</i> 2009; 31(6):759-764.	3a	100 patients	To compare LC, OS, and laryngeal preservation in a homogenous group of patients with T1a glottic carcinoma with normal/diminished mucosal wave treated with either CO(2) laser surgery or RT.	No significant differences in LC and OS were found. Ultimate 5-year laryngeal preservation was significantly better in the CO(2) laser surgery group (95% vs 77%, P=.043). Patients with T1a glottic carcinoma with normal/diminished mucosal wave treated with CO(2) laser surgery had a significantly better laryngeal preservation rate than patients treated with RT.	2

## Evidence Table Key

### Study Type Key

Numbers 1-7 are for studies of therapies while numbers 8-15 are used to describe studies of diagnostics.

1. Randomized Controlled Trial — Treatment
2. Controlled Trial
3. Observation Study
  - a. Cohort
  - b. Cross-sectional
  - c. Case-control
4. Clinical Series
5. Case reviews
6. Anecdotes
7. Reviews
  
8. Randomized Controlled Trial — Diagnostic
9. Comparative Assessment
10. Clinical Assessment
11. Quantitative Review
12. Qualitative Review
13. Descriptive Study
14. Case Report
15. Other (Described in text)

### Strength of Evidence Key

- Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.
- Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.
- Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.
- Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

## Abbreviations Key

3DCRT = 3D conformal radiation therapy  
CI = Confidence interval  
DFS = Disease-free survival  
EBRT = External-beam radiation therapy  
IMRT = Intensity-modulated radiotherapy  
LC = Local control  
OR = Odds ratio  
OS = Overall survival  
RR = Relative risk  
RT = Radiation therapy  
SCC = Squamous cell carcinoma  
TLM = Transoral laser microsurgery