

**Conclusions:** RT and L have almost the same expected average cost for the treatment of T1N0 glottic SCC, whereas PL is twice as expensive. Cost-effectiveness analysis (with voice quality as effectiveness parameter) is in progress.

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### Larynx conservation in a randomized trial of hyperfractionated (HFRT) versus conventional once daily radiation (CRT): A subgroup analysis

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**Purpose:** To examine the ability of HFRT and CRT to conserve the larynx in patients with advanced laryngeal cancer.

**Methods:** Between 1988 and 1995, 336 patients with locally advanced cancers of the larynx, hypopharynx or oropharynx were randomized to receive radiation therapy (RT) with curative intent. A subset of 116 patients had category T3 or T4 (UICC-AJC 1987) primary larynx cancer. Treatment was either 51Gy TAD/20 fractions/4 wk (2.55 Gy 1x/d = CRT) or 58 Gy TAD/40 fractions/4 wk (1.45 Gy 2x/d, 6 hr interval, = HFRT). Surgical salvage was performed for residual cancer whenever possible.

**Results:** The primary cancer arose in the glottis in 30, and in the supraglottis in 86; 51 tumors were T3 and 65 were T4. The local recurrence free rates at 3 yr were 50% (CRT) and 54% (HFRT) (Log rank  $p = 0.46$ ). Local control was achieved in 46% (24/52) of those who had tracheostomy prior to RT. The overall survival rates at 3 yr were 47% (CRT) and 69% (HFRT) ( $p = 0.04$ ). No patient experienced toxicity which required laryngectomy.

**Conclusion:** In this subset analysis there is no significant advantage of HFRT over CRT at the doses given with respect to control of advanced laryngeal cancer. Both fractionation schemes proved capable of preserving the larynx in more than 50% of patients with either T3 or T4 cancer. Prior tracheostomy did not prevent larynx conservation by RT.

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### Organ preservation and survival with surgical treatment for larynx carcinoma

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**Objective:** This prospective study evaluates the potential role of organ sparing surgical procedures for larynx carcinoma in a large series of unselected patients from a single institution.

**Patients and Methods:** 504 consecutive patients with previously untreated carcinoma of the larynx were seen from 1986 to 1994. The treatment protocol included transoral laser surgery (TLS) of the primary for lesions classified T1/T2; conventional partial laryngectomies for these lesions if they were not accessible endoscopically; total laryngectomy for most lesions classified T3/T4; and radiotherapy for patients not suited for surgery.

**Results:** TLS was used in 290 patients (58%), total laryngectomy in 130 (26%), conventional partial laryngectomies in 31 (6%), radiotherapy in 34 (7%). Nineteen (4%) had no curative treatment. Five-year uncorrected actuarial survival was 67.7%, and cause specific survival was 86.9% for the 485 patients with curative treatment. 63.3% of them had their larynx preserved.

**Conclusion:** TLS was the most important single treatment modality in this series. Surgery as the main therapeutic approach (in combination with postoperative radiotherapy for advanced stages) leads to excellent survival rates and a high percentage of final organ preservation.

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### The role of postoperative radiotherapy in the treatment of salivary gland carcinoma's

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**Purpose:** In a Dutch multicentric retrospect. study prognostic factors for local control in salivary gland carcinoma's treated with surgery +/- radiotherapy were studied.

**Methods and Materials:** Out of 568 patients 501 were treated with surgery, in 389 combined with postoperative radiotherapy (50-70 Gy, mean

dose 62 Gy). In the surgery alone group oral cavity tumors and small, radically resected tumors prevailed. Patients were treated between 1985 and 1994. The parotid gland was involved in 59%, submandibular gland in 14%, oral cavity in 24% and 3% elsewhere. Tumorstage was 29% T<sub>1</sub>, 47% T<sub>2</sub>, 18% T<sub>3</sub> and 6% T<sub>4</sub>; 87% N<sub>0</sub>. Resection margins were radical in 37%, close in 20% and irradiated in 40%, unknown in 3%.

**Results:** In a multivariate analysis, using Cox proportional hazard regression analysis, independent factors for local control were T-stage (T<sub>1</sub> = T<sub>2</sub> > T<sub>3</sub>, > T<sub>4</sub>;  $p < 0.001$ ), anatomic site (oral cavity > parotid and submand. gland, > elsewhere;  $p = 0.009$ ) and treatment modality. Actuarial local control after 8 yr was 80% for surgery alone and 92% for the combined modality (in which more advanced cases prevailed),  $p < 0.001$ . No dose response relation was shown. Bone invasion ( $p < 0.001$ ) was an independent histologic factor; histologic type, resection margin, age and sex were not.

**Conclusion:** Postoperative radiotherapy improves local control, however small (<4 cm) tumors in the oral cavity, radically resected, may be treated with surgery alone (97% local control). A dose response relationship was not shown, however most patients were treated with  $\geq 60$  Gy. Local control was independent of histologic type.

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### Acoustic neuromas (AN) treated by fractionated stereotactic radiosurgery (FSR)

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Single fraction radiosurgery of AN is remarkable for high control but not infrequent incidence of facial and trigeminal neuropathy. Large tumors treated surgically often result in deafness, facial neuropathy. FSR was developed to maintain efficacy and minimize toxicity.

Described are 38 patients (pts) with 39 AN. Age range: 35 to 89 years (mean 60). 2000 Centigray (cGy) divided weekly dose 400 or 500 cGy was delivered. Volume ranged 0.1-32.0 cc (mean 6.9). 23 AN had diameters <3 cms (range 0.3-2.8, mean 1.6). 16 measured 3 cms or greater ranged 3.0-5.0 (mean 3.7).

All tumors were controlled. 14 smaller (61%) decreased in size. 9 showed cessation of growth. Radiographic follow up ranged 4-34 months (median 16.3). Clinical follow up was 5-37 months (median 27.1). 21 pts with audiometry, 2 improved, 18 remained stable and 1 worsened. One pt had transient facial weakness after treatment which resolved. 22 pts, 15 had improved balance, 7 were unchanged.

13 of 16 (81%) larger AN diminished in size. Remainder showed cessation of growth. Radiographic follow-up ranged 4-30 months (median 20.7). Clinical follow-up was 14-35 months (median 28.1). 11 pts with audiometry 2 improved, 8 were stable and 1 worsened. Of 15 symptomatic pts, 12 had improved balance, 2 were stable, 1 worsened. All were controlled. No pt developed 5th nerve symptoms after treatment, no pts required surgery for treatment failure. 1 pt had temporary 7th nerve palsy.

FSR offers a therapeutic approach producing high control rates while avoiding frequent morbidity.

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### Complications in the surgical treatment of carotid body paragangliomas

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**Purpose:** Carotid body paragangliomas are rare neoplasms and usually occur in the third to sixth decade of life. Complications of surgical resection are frequently related to encasement of neurovascular structures and require meticulous subadventitial dissection.

**Method:** Retrospectively we studied our results and complications.

**Results:** During the period 1971 to 1995, 34 paraganglioma carotidum tumors were treated in 20 female and 8 male patients. The mean age was 39 (range 11-68) years. Localisation and extension of the tumor was visualized with digital subtraction angiography (DSA) and since 1992 by CT angiography and MRI according to Shamblin. Resection could be performed in 27 patients. There was no perioperative mortality. The external carotid artery had to be sacrificed in 7 pts and the internal carotid artery had to be reconstructed in 3 pts. All these tumors were classified to Shamblin III. One pt had a transient CVA. Cranial nerve injuries occurred in 7 pts, all with Shamblin II/III lesions. These were temporary and involved the facial (3),