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Laryngeal carcinoma in younger patients

Z. PETROVIĆ, G. STOJČIĆ AND S. JEŠIĆ

Abstract

During the period 1976-1988, 988 patients were treated surgically for laryngeal cancer of whom 61 were below the age of 40 years.

In 29 patients the tumour was localized in the supraglottis, and in 32 in the glottis. T_1 tumour was present in 32 (52.46 per cent), and T_2 tumour in six (9.84 per cent) patients. Advanced T_3 and T_4 tumours were present in 13 (21.31 per cent), and (16.39 per cent) patients respectively. The majority had clinically negative findings in the neck (N_0). Conservative or reconstructive surgery was applied in 39 (63.93 per cent), and radical in 22 (36.07 per cent) patients. Planned post-operative radiotherapy was carried out in 28 (45. 90 per cent) patients.

The five-year survival rate of the studied patients was 83.61 per cent (51/61). The five-year survival rate of the patients with laryngeal carcinomas within the same period was 68.32 per cent (675/988). There was no significant difference in survival rate: $X^2 = 0.018$, DF = 1, $p>0.05$.

Key words: Laryngeal neoplasms; Carcinoma

Introduction

The incidence of laryngeal carcinoma in patients up to 40 years of age is relatively low, with laryngeal carcinoma in children being particularly uncommon (Jones and Gabriel, 1969; Laurian *et al.*, 1984).

Possible risk factors in childhood may be: presence of carcinoma in the family, drug-taking in pregnancy, exposure to ionizing radiation in pregnancy, exposure to ionizing radiation upon birth, papillomatosis of the larynx, immunosuppressive therapy, passive smoking (Majores *et al.*, 1963; Guggenheimer *et al.*, 1986; Schwartz *et al.*, 1990). In the third and fourth decade of life the risk factors involve: smoking, intake of strong spirits, exposure to aerial pollution, chronic laryngitis and laryngeal keratosis, and according to some authors, also an inclination to depressive moods and chronic vocal strain (Decker and Goldstein, 1982).

Materials and methods

At the Institute of Otorhinolaryngology and Maxillofacial Surgery, within the period 1976–1988, there were 988 patients with laryngeal carcinomas treated with primary surgery. Of that number, 61 patients were aged up to 40 years. All the patients passed the oncological council consisting of otorhinolaryngologists, radiotherapists and chemotherapists. The patients' data were put into questionnaires and statistically analysed.

Results

The youngest patient was 25 years old. There were four patients (6.56 per cent) in the group of patients younger than 30 (Table I).

In 29 patients the tumour was localised in the supraglottis, and in 32 patients in the glottis. There were no patients with primary tumour localisation in the subglottis. Out of patients with supraglottic tumours, in 16 the tumour was localised in the epilarynx, and in 13 in the supraglottis excluding the epilarynx. According to the TNM classification of malignant tumours of the International Union Against Cancer (1987) epilarynx (including marginal zone) includes: suprahyoid epiglottis (including the tip), aryepiglottic fold and arytenoid; and supraglottis excluding epilarynx includes: infrahyoid epiglottis, ventricular folds (false cords) and ventricular cavities.

T_1 tumour was present in 32 patients, and T_2 tumour in six patients. Advanced T_3 and T_4 tumours were present in 13, and 10 patients respectively. A regional N_1 tumour was seen in 10 patients. There were no patients with a higher degree of regional

TABLE I
TUMOUR DISTRIBUTION ACCORDING TO AGE OF PATIENTS

Age (years)	No.	%
≤20	0	0
21–30	4	6.56
31–40	57	93.44
Total	61	100.00

From the Institute of Otorhinolaryngology and Maxillofacial Surgery, Clinical Centre of Serbia, Belgrade, Yugoslavia.
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TABLE II
TUMOUR DISTRIBUTION ACCORDING TO LOCALIZATION AND LOCO-REGIONAL EXTENT

Localisation	T	N_0	N_1	N_2	N_3	Total
Epilarynx	T_1	6	0	0	0	6
	T_2	1	1	0	0	2
	T_3	3	2	0	0	5
	T_4	0	3	0	0	3
Supraglottis excluding epilarynx	T_1	8	0	0	0	8
	T_2	1	1	0	0	2
	T_3	0	1	0	0	1
	T_4	0	2	0	0	2
Glottis	T_1	18	0	0	0	18
	T_2	2	0	0	0	2
	T_3	7	0	0	0	7
	T_4	5	0	0	0	5
Total		51	10	0	0	61

tumour—N_2 and N_3. Nor were there patients with distant metastases (Table II).

In all patients, planocellular laryngeal carcinomas were in question. In those patients where biopsy and pathohistological examination were performed at our Institute, the grade of histological tumour malignancy was determined as a rule, that is the grade of tumour differentiation. In most patients, good differentiation (G_1) was in question, and in a fewer number moderate differentiation (G_2) of the tumour cells. There were no patients with poor differentiation of the tumour cells (G_3).

In planning surgical treatment, tumour localization, local and regional tumour extent, histological malignancy, as well as the general health condition of patients were taken into account. Conservative or reconstructive surgery on the larynx (chordectomy, partial vertical laryngectomy, partial supraglottic horizontal laryngectomy, subtotal laryngectomy) was performed in 39 patients. Radical surgery (total laryngectomy, total pharyngolaryngectomy) was performed in 22 patients.

Combined therapy—surgery with planned post-operative radiotherapy—was applied in 28 patients. Indications for post-operative radiotherapy applications included: intra-operatively taken marginal biopsies positive to malignancy, local and regional tumour extent and histological tumour malignancy.

Recurrences of tumours appeared in 15 patients (24.59 per cent). They all developed in an interval between six and 27 months after the treatment was finished.

Among the patients with tumour in the epilarynx, recurrences developed in seven cases (43.75 per cent). In two of those patients the recurrences developed in the neck-like regional ones (T_1N_0, T_2N_0). Radical neck dissection with post-operative radiotherapy was performed on these patients. They are alive with no evidence of tumour. One patient had local recurrence in the hypopharynx (T_3N_1) and two patients have had local recurrences on the base of tongue (T_3N_0, T_4N_1). These patients had inoperable recurrences and have died. Two patients developed distant recurrences on the lungs (T_2N_1 T_4N_1). They have also died. The survival rate in patients with tumour in the epilarynx is 68.75 per cent (11/16).

TABLE III
TUMOUR RECURRENCES DISTRIBUTION ACCORDING TO LOCALIZATION AND LOCO-REGIONAL EXTENT

Localisation	T_1		T_2		T_3		T_4		Total
	N_0	N_1	N_0	N_1	N_0	N_1	N_0	N_1	
Epilarynx	1		1	1	1	1		2	7
Supraglottis without epilarynx		1		1		1		1	4
Glottis			1		1			2	4
Total	1	1	2	2	2	2		5	15

Among the patients with tumour in the supraglottis excluding the epilarynx recurrences appeared in four cases (30.77 per cent). One patient (T_1N_1) developed a neck metastasis. Radical neck dissection was performed on him. The second patient (T_2N_1) has developed a local recurrence in the larynx after the supraglottic partial horizontal laryngectomy and a total laryngectomy was performed. These two patients are alive with no evidence of tumour. One patient (T_3N_1) had an inoperable local recurrence on the base of tongue and died. The fourth patient (T_4N_1) had a distant recurrence on the lungs. He also died. The survival rate in patients with tumour in supraglottis excluding epilarynx is 84.62 per cent (11/13).

Amongst the patients with tumours in the glottis, recurrences developed in four cases (12.5 per cent). In one patient (T_2N_0) a local recurrence in the larynx developed after partial vertical laryngectomy. Total laryngectomy was performed. He is alive with no evidence of tumour. A patient (T_3N_0) with distant recurrences on lungs and two patients (T_4N_1) with stomal recurrences died. The survival rate in patients with tumour in the glottis is 90.63 per cent (29/32) (Table III).

A five-year tumour-free survival rate of the studied patient group was 83.61 per cent (51/61). If the survival rate of younger patients is compared with the survival rate of the total number of primarily surgically treated patients within the same period (68.32 per cent; 675/988), there is no significant difference in survival—$X^2 = 0.018$, DF = 1, $p>0.05$.

Discussion

Reports of laryngeal carcinoma in persons younger than 40 have been relatively rare, and in children up to 15 extremely rare (Ver Maluen, 1966; Pandey and Chouhury, 1968; Zehender and Lyons, 1975; Seth *et al.*, 1978; Ossoff *et al.*, 1980; Singh and Kaur, 1987; Ohlms *et al.*, 1994; Simon *et al.*, 1994).

Herold and Bockmuhl (1966) reported that in East Germany the incidence of laryngeal carcinoma in patients younger than 20 was 0.5 per cent.

Gindhart *et al.* (1980) reported that, since 1868, 54 cases of laryngeal carcinomas in children have been published. It was outlined that the diagnosis was frequently established late since laryngeal carcinoma

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was not suspected. Problems with respiratory obstruction were considered a result of upper airway infection, and hoarseness was ascribed to the voice alteration in puberty.

Newman and Byers (1982) put forward that the prognosis in children affected by laryngeal carcinoma was worse than in adults since histologically more malignant forms were more common in children.

In treatment of laryngeal carcinomas in children surgical treatment is advised with maximal preservation of the surrounding laryngeal tissue. Fearon *et al.* 1982 think that the therapy of choice is the use of a carbon dioxide laser. Radiotherapy is not recommended because it may cause problems in physical development, growth arrest and induce subsequent malignancy development.

Laryngeal carcinomas in the third and fourth decade of life are more common.

Clark *et al.* 1982 presented data on 10 232 patients with malignant tumours of the head and neck, 272 of whom were patients up to 30 years of age. There were 14 patients with laryngeal carcinomas.

Carniol and Fried (1982) reported about 2 700 patients with carcinoma of the mesopharynx, larynx and epipharynx. Of these 36 patients were 40 years of age and 13 patients suffered from laryngeal carcinoma. They pointed out that the survival rate of younger patients with laryngeal carcinoma was equal to the survival rate of the whole patient group.

Benninger *et al.* (1988) outlined the data on 1 027 patients with planocellular carcinomas of the head and neck. In the group up to 40 years of age there were 41 patients, of these 13 patients had laryngeal carcinomas. They recommended a more aggressive approach to treatment—application of combined therapy: surgery and radiotherapy.

At our Institute, there were no patients below 20 years of age suffering from laryngeal carcinoma. In the studied group of patients up to 40 years of age, we did not notice any specificities as compared to the age group 51–70 years where laryngeal carcinomas were the most prevalent. In therapy planning, of crucial importance were local and regional tumour extent, tumour localisation, histological tumour malignancy and general health condition of patients. The relative youth of the studied patient group was not taken into account as a separate factor in therapy planning. The therapeutic results in the studied group of younger patients did not significantly deviate from the therapeutic results for the whole patient group suffering from laryngeal carcinoma.

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Address for correspondence:
Dr. Ž. Petrović,
Institute of Otorhinolaryngology and Maxillofacial Surgery,
2 Pasterova St.,
11000 Belgrade,
Yugoslavia.

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