Laryngeal cancer in Lower Silesia: descriptive analysis of 501 cases

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Abstract

This paper presents a descriptive analysis of 501 cases of laryngeal cancer. The patients were classified according to their age, sex, primary tumour localisation and stage. There were 448 males and 53 females, with a male-to-female ratio of 8.5:1. The peak incidence of cancer was detected in the 6th and 7th decades of age. The most common primary tumour localisation was the glottis. Three-hundred-and-forty patients presented at advanced tumour stages (T3/T4). The proportion of patients presenting metastatic neck nodes was 29.3% and the incidence of metastatic lymph nodes increased with increasing T stage. Histopathological analysis revealed that 98% of tumours were squamous cell carcinomas. There were 125 well-differentiated, 235 moderately differentiated and 133 poorly differentiated carcinomas. Among other tumours, there was 1 adenoid squamous cell carcinoma, 1 giant cell carcinoma, 1 adenoma pleomorphicum, 1 adenoid cystic carcinoma (cylindroma), 1 haemangiopericytoma, 1 verrucous cell carcinoma, 1 lymphoepithelioma and 1 granular cell tumour. © 1998 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Carcinoma of the larynx is the most common malignant tumour in the upper aerodigestive tract. It represents 2.3% of all malignant tumours in males and 0.4% of all malignant tumours in females, excluding basal and squamous cell carcinoma of the skin. It occurs at a peak incidence in men in their 6th and 7th decade, and it occurs in a male-to-female ratio of about 10:1. There is a strong connection between laryngeal cancer and lifestyle and environmental factors [1].

The histology of most cancers of the larynx is a well-differentiated squamous cell carcinoma. Most are of the keratin-producing variety. Rarely, other types of tumours are found. Laryngeal cancer has a high mortality rate if unattended but the condition is potentially curable if discovered early enough and treated appropriately.

Statistical information about cancer is very important for the better planning of prophylactics and treatment strategies. This study comprises a descriptive analysis of 501 cases of laryngeal cancer treated in Wrocław (Lower Silesia, Poland).

1.1. Materials and methods

The patients with laryngeal malignant neoplasms treated in the Department of Otolaryngology, Head and Neck Surgery, Medical University of Wrocław from 1991 until 1995 were included in this study. The medical reports of patients in whom diagnosis was confirmed were retrospectively evaluated. The patients were classified according to their age, sex, primary tumour localisation and tumour stage. The histology of the tumours was classified with reference to the Histological Typing of Tumours of the upper Respiratory Tract and Ear (WHO) [2]. Tumour staging was performed according to TMN criteria (WHO) [3]. The histological grading of squamous cell carcinomas was performed according to G1–3 scale [4].

The analysis of the data was performed by means of the statistical package ‘S-Plus’. Relations between different features were determined by analysis of variance, Scheffe test, LSD test, Chi-square test and Mann–Whitney–Wilcoxon test.
2. Results

501 patients with laryngeal cancer were reviewed. There were 53 females and 448 males, with a male-to-female ratio 8.5:1. The mean age of the patients was 61.3 ± 10.2 years. The ages of the patients ranged from 34 to 89 years. There was no statistical difference between the mean age of males and females although the age range was narrower in women than in men. Most patients were in their 6th and 7th decades of life. Only 1% of the patients were under 40 years of age.

The TNM staging is presented in Table 1. Most of the tumours were diagnosed in advanced stages. There were 320 (63.8%) patients in stages T3/T4. Glottic cancers were diagnosed at earlier stages (61% diagnosed at stages T1 and T2) when compared to supraglottic cancers (77% diagnosed at stages T3 and T4) (P < 0.001).

The existence of lymph node involvement was noted in 147 (29.3%) cases. The incidence of neck node metastases increased with increasing T stage (P < 0.001), and was higher in supraglottic than glottic tumours (P < 0.001). Distant metastases were detected in 9 (1.8%) cases. Most of them were noted in the larynx. There was no relation between the sex and age of the patients and stage of disease.

82% of the tumours (n = 410) were localised in supraglottic and glottic regions. The ratio of glottic to supraglottic tumours was 1.2 to 1. In 23 (4%) cases the tumour arose from the subglottic region. In 68 (14%) cases the tumour involved all regions of the larynx and it was impossible to determine the place of origin.

There was no correlation between sex and age of the patients and tumour localisation. There was also no correlation between sex and age of the patients and site of the tumour.

After diagnosis the patients were treated by surgery, radiotherapy or chemotherapy. 276 patients underwent complete surgical excision of the tumour with free margins. 72 patients were treated by radiotherapy alone and 143 patients underwent surgery and subsequent radiotherapy. In 10 cases palliative chemotherapy was performed.

Histopathological analysis revealed that 98% of tumours were squamous cell carcinomas. There were 125 well-differentiated, 235 moderately differentiated and 133 poorly differentiated carcinomas. There was no correlation between sex of the patients and histopathologic grading of the tumours.

Among other tumours there was 1 adenoid squamous cell carcinoma, 1 giant cell carcinoma, 1 adenoma pleomorphic, 1 adenoid cystic carcinoma (cylindroma), 1 haemangiopericytoma, 1 verrucous cell carcinoma, 1 lymphoepithelioma and 1 granular cell tumour (Table 2).

Adenoid squamous cell carcinoma arose in 64-year-old men in the glottic region. Giant cell carcinoma was detected in a 53-year-old woman. The tumour involved all regions of the larynx. Adenoma pleomorphic occurred in 64-year-old men. The tumour, covered by unchanged mucosa, was localised in epiglottic region. Adenoid cystic carcinoma was resected from a 48-year-old male. The tumour arose from the subglottic region. Haemangiopericytoma occurred in the glottic region of a 26-year-old male. The tumour grew exophytically and its surface was uneven. Verrucous cell carcinoma was detected in a 78-year-old patient. It was a polyp-like tumour arising from the vocal cord. Lymphoepithelioma occurred in the supraglottic region of a 48-year-old male. Granular cell tumour was detected in the epiglottic region of a 64-year-old woman. Macroscopically, the tumour had a nodular appearance and was covered by unchanged mucosa.

3. Discussion

The larynx is the most common primary tumour localisation among all squamous cell carcinomas of the head and neck. There is geographical variation with regard to the region affected by the laryngeal cancer. The incidence rates in Europe range from 17.1 per 100 000 of the population in Spain to 2.5 in Sweden. Its frequency is estimated globally as 7.0 in males and 0.9 in females [5].

Laryngeal squamous cell carcinomas constituted 4.7% of all hospitalised cancer patients (6.4% of males and 2.2% of females) and 62.7% of all squamous cell carcinomas of the head and neck in Turkey in 1992 [6]. In Italy incidence rates of laryngeal cancer increased from 10.0 in 1970 to 12.2 in 1989 [7].
In the last 30 years in Poland, the standardised rates experienced a more than six-fold increase from 2.4 per 100,000 in 1959 to 15.2 per 100,000 in 1988 [8]. Lower Silesia belongs to the regions of Poland with the highest incidence of laryngeal cancer. Poland had, in 1993, mortality rates of laryngeal cancer at a level of 8.0 per 100,000 for men and 0.7 per 100,000 for women [9].

In the years 1975–1979 in our Department, 373 patients with laryngeal cancer were treated [10]. When we compared these figures with the results presented in the present study we saw a substantial increase of incidence of laryngeal cancer in our region.

The mean age of patients with laryngeal cancer treated in our Department has not changed in the past 20 years [10]. There are also no changes in the stages of disease at which the patients were first diagnosed [10]. We noticed a slightly higher incidence of laryngeal cancer in women than in previous reports from our region. In our series this ratio was 8.5:1 vs 10.3:1, reported by Baran et al. [10].

Most studies report that the male-to-female ratio of patients with laryngeal cancer is on average 10:1, although in the study of Kurtulmaz, from Turkey, this ratio was 29.6:1 [11].

In our study, glottic localisation was the most common among laryngeal cancers. The same results were reported in the United States and Japan [12,13]. In the studies from Finland and Turkey the ratios of supraglottic to glottic tumours were 1.8:1 and 1.5:1, respectively [11,14]. In the study of Maier and Tisch [15], from Germany, the incidence of glottic and supraglottic carcinomas was almost the same (33 vs 32.9%). The percentage of subglottic tumours in our study was slightly higher than reported in other studies [11,16].

The earlier detection of glottic cancers noticed in our study may be partly attributed to the rapid onset of symptoms associated with cancers that interfere with normal vocal cord vibration and frequently result in hoarseness.

It is worth noting that the supraglottic to glottic tumour ratio has changed in Lower Silesia in the past 15 years. In the report from the years 1980–1985 there were more supraglottic than glottic tumours, whereas in our study we noticed an inverse relation [17]. Taking into account that cigarette smoking and drinking alcohol have different influences on developing supraglottic and glottic cancer, this may be explained to some extent by the changing habits of Polish society. In the past few years alcohol consumption has decreased whereas tobacco smoking remains very popular.

The majority of malignant tumours of the larynx are squamous cell carcinomas. In our study they accounted for 98% of all neoplasms. Roland et al. found that the majority of squamous cell carcinomas of the larynx were well differentiated and that the differentiation was related to age and sex [18]. The relation between the level of differentiation of the tumour and sex was also noted by Lam and Yuen [19]. In our study we did not find a relationship between sex, age and tumour differentiation. Moderately differentiated carcinomas were detected most frequently which confirms the results of Lam [19].

The incidence of salivary gland neoplasms of the larynx is estimated to be less than 1% of all laryngeal tumours [20]. It is also difficult to estimate the incidence of the different types of laryngeal salivary neoplasms. In the present study, the incidence of these tumours was 0.4%. These comprised 1 pleomorphic adenoma and 1 adenoid cystic carcinoma (cylindroma).

Pleomorphic adenoma of the larynx is very rare. There is no sex predilection. The majority of cases occur in the epiglottis, aryepiglottic fold and vestibular fold [20]. The first well-documented case was published by Abercromby and Rewell [21]. Since then, some others cases have been reported [22–24]. The case presented in this study arose from the epiglottis and was successfully treated by surgery.

Adenoid cystic carcinoma occurs in the larynx more frequently than pleomorphic adenoma. Synonyms of adenoid cystic carcinoma include cylindroma, adenocarcinoma of cylindroma type, cylindromatous carcinoma, and cribriform adenocarcinoma. The term ‘adenoid cystic carcinoma’ is now widely accepted and recommended by the WHO [2]. Approximately 100 cases of adenoid cystic carcinoma of the larynx have been reported. Two-thirds of the neoplasms arose in the subglottic region, with the remainder occurring mainly in the supraglottic area and a few involving the glottis [25]. The case presented in this study arose from the subglottic region.

Haemangiopericytomas are rare tumours that can occur at any site. Histologically the tumours are composed of small vessels whose lamina are surrounded by spindle-shaped pericytes in a radial arrangement outside the capillary basement membrane. Most are benign tumours, but local recurrence or distant spread

<table>
<thead>
<tr>
<th>Histological types</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squamous cell carcinoma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well differentiated</td>
<td>125</td>
<td>24.8</td>
</tr>
<tr>
<td>Moderately differentiated</td>
<td>235</td>
<td>46.9</td>
</tr>
<tr>
<td>Poorly differentiated</td>
<td>133</td>
<td>26.5</td>
</tr>
<tr>
<td>Adenoid squamous cell carcinoma</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Giant cell carcinoma</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Adenoma pleomorphum</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma (cylindroma)</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Verrucous squamous cell carcinoma</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Lymphoepithelioma</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Haemangiopericytoma</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Granular cell tumour</td>
<td>1</td>
<td>0.2</td>
</tr>
</tbody>
</table>
eventuates in about 20% of patients [4]. In the present review, the case of haemangioepiteloma occurred in the supraglottic region.

Lymphoepithelioma is a neoplasm which occurs most often in the nasopharynx. The localisation of this tumour in the larynx is very rare. Ferlito found only 1 such case among 2052 neoplasms of the larynx and hypopharynx [26]. Synonyms for adenoid cystic carcinoma include undifferentiated carcinoma of nasopharyngeal type, anaplastic carcinoma with lymphoid component and lymphoepithelial carcinoma. The tumour presented in our paper was located in the supraglottic region.

Approximately 200 cases of granular cell tumours have been reported in the larynx [20]. Microscopically, the tumour consists of tightly packed masses of large, moderately eosinophilic cells with abundant granular cytoplasm containing diastase-resistant, PAS-positive granules which also stain red with Masson trichrome [20]. The sex incidence shows a moderate male preponderance. It most commonly occurs in the 3rd to 6th decades of life. The majority of granular cell tumours have been located in the vocal cords [27]. We presented the case of a tumour which occurred in the epiglottic region.

Our findings confirm the previous reports that laryngeal cancer incidence in Lower Silesia is the highest in Poland. Almost all previously described characteristics of the patients and tumour in our region have not changed in the last 25 years. We only noticed the change in proportion between supraglottic and glottic cancers. There is also a slight change in the male-to-female ratio. It is worth noticing the comparatively high number of subglottic cancers in our group.

References