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Head and Neck Sarcomas. Our Experience

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Abstract

Introduction: Head and neck sarcomas are a heterogeneous group of malignant tumours that vary greatly in clinical presentation, with different histopathological and biological characteristics.

Material and methods: This was a retrospective study of patients with sarcoma located in the head and neck treated in our centre over a period of 25 years.

Results: During the study period, a total of 25 patients were diagnosed with sarcomas in the head and neck, accounting for 0.5% of all malignancies at this level. The most common treatments included surgical resection of the tumour, often supplemented with radiotherapy and/or adjuvant chemotherapy. The final local control, including the salvage, was 52%, with an adjusted survival of 51% at 5 years and 32% at 12 years.

Conclusions: Surgical treatment of patients with head and neck sarcomas achieves acceptable results of local control and survival.

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PALABRAS CLAVE
Sarcoma; Tumor de cabeza y cuello; Grado de malignidad; Supervivencia

Sarcomas de cabeza y cuello. Nuestra experiencia

Resumen

Introducción: Los sarcomas de cabeza y cuello son un grupo heterogéneo de tumores malignos con una alta variabilidad en la presentación clínica, en su clasificación histopatológica y sus características biológicas.

Material y métodos: Estudio retrospectivo de los pacientes con un sarcoma localizado en cabeza y cuello tratado en nuestro centro a lo largo de un periodo de 25 años.

Resultados: Durante el periodo de estudio fueron diagnosticados un total de 25 pacientes con sarcomas localizados en cabeza y cuello, que representaron un 0,5% del total de tumores...
Introduction

Head and neck sarcomas are rare tumours of mesenchymal origin that represent less than 1% of the tumours in this location. The estimated incidence of sarcomas in all anatomical regions is approximately 3–4.5/100,000 inhabitants, and most occur in the extremities and retroperitoneum. Only 10% of all sarcomas occur in ENT territory. The exception occurs in childhood, in which up to 40% of sarcomas are located at the head and neck levels, especially due to the characteristic incidence and location of rhabdomyosarcoma at this early age.1

Sarcomas have a high biological and histological diversity, so their behaviour varies from tumours that tend towards local recurrence with minimal metastatic potential, to a rapid systemic spread despite the application of aggressive treatment.1–4 Characteristically, normal tissues on the periphery of sarcomas are compressed as a result of tumour expansion, forming a pseudocapsule. This pseudocapsule is often invaded by malignant cells that may cross fascial planes, muscle, blood vessels and nerves. As a result, sarcomas can invade areas of difficult surgical access, making it more difficult to obtain adequate resection margins.5

Sarcomas are a group of tumours with different epidemiological, histological and clinical characteristics from those of head and neck carcinomas.6 In most cases, they lack the classic risk factors present in carcinomas, such as tobacco and alcohol consumption. Most published series describe a male predominance, reaching male/female ratios of up to 2:1,5 although there are some series in which the female gender is predominant.3

The aetiopathogenic mechanism of sarcomas is unknown. A history of prior irradiation is found in only 3% of cases.6 Advances in molecular biology sometimes allow a diagnosis of certainty, as is the case with the t translocation (X;18), occurring in 100% of synovial sarcomas.7

A wide variety of therapeutic approaches are used in the management of these tumours. Traditionally, surgery has been considered as the treatment of choice. Due to the high rate of recurrence of these tumours after surgery, radiotherapy and chemotherapy have recently been added as additional treatment strategies, to improve disease control and survival. The combined use of treatments has significantly improved the prognosis of some forms of sarcoma, such as rhabdomyosarcoma in childhood.

The aim of our study was to carry out a review of the results obtained at our hospital with patients diagnosed and treated for a sarcoma located in the head and neck region during a period of 25 years, comparing these results with those reported in the literature.

Material and Methods

This study was carried out retrospectively, using a database that prospectively collected information from patients with malignant head and neck tumours diagnosed at our centre since 1985. We included patients diagnosed with sarcoma located in the head and neck region. We excluded sarcomas with an intracranial and orbital location from the study, as well as haemangiopericytoma, given that they are considered as benign mesenchymal tumours since the last WHO histological classification.8

All patients were followed for at least 2 years, with a median follow-up of 4.9 years.

The histological classification was carried out based on a proposal by the WHO, dividing the tumours into 3 grades, high, intermediate, and low, depending on the degree of differentiation of tumour tissue. The diagnosis was obtained from the first anatomopathological examination, with no specific histological review of the cases being conducted for this study.

None of our patients presented a prior history of irradiation. All patients included in the study had undergone a complete ENT examination, an imaging test (CT and/or MRI) and an extension study.

Survival was analysed by the Kaplan-Meier method of actuarial calculation.

Results

Characteristics of the Tumour

A total of 25 patients with sarcomas located in the head and neck region were diagnosed at our institution during the study period. Of these, 16 were male (64%) and 9 were female (34%). The age of tumour onset varied widely, ranging from the first year of life to 78 years. A total of 7 patients (28%) were younger than 20 at the time of diagnosis.

The anatomical location of sarcomas in the ENT territory presents a marked heterogeneity in all series. In our series, the most frequent locations were the nasal fossae
and sinuses (32%) and the cervical area excluding the aerodigestive tract (32%). Most cases began as an asymptomatic mass (36%), with initial symptoms including epistaxis, nasal obstruction, dysphonia or dysphagia in other cases, depending on the location of the tumour.

According to the histology, the most frequent tumour in our series was synovial sarcoma (6 cases), followed by malignant fibrous histiocytoma (4 cases) and rhabdomyosarcoma (4 cases). The vast majority of patients presented high-grade tumours (80%).

The volume of these tumours at the time of diagnosis is often important. Up to 56% of the cases in our series had a size larger than 5 cm at diagnosis.

Table 1 shows the distribution of patients with head and neck sarcomas diagnosed at our centre according to variables such as gender, age, location of the tumour, histological type and tumour size at the time of diagnosis.

### Table 1
Distribution of the 25 Patients With Head and Neck Sarcomas According to Different Variables.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male 16 (64%)</th>
<th>Female 9 (36%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1-20 years 7 (28%)</td>
<td>21-40 years 5 (20%)</td>
</tr>
<tr>
<td>Location</td>
<td>Nasal fossae and sinuses 7 (32%)</td>
<td>Cervical 7 (32%)</td>
</tr>
<tr>
<td>Histology</td>
<td>Synovial sarcoma 6 (24%)</td>
<td>Fibrous histiocytoma 4 (16%)</td>
</tr>
<tr>
<td>Grade of malignancy</td>
<td>High (III/III) 20 (80%)</td>
<td>Medium (II/III) 2 (8%)</td>
</tr>
<tr>
<td>Size of the tumour</td>
<td>&gt;5 cm 14 (56%)</td>
<td>&lt;5 cm 8 (32%)</td>
</tr>
</tbody>
</table>

Table 2 details the therapeutic sequences used in the 25 patients with head and neck sarcomas.

### Table 2
Therapeutic Sequences Used in the 25 Patients With Head and Neck Sarcomas.

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Only surgery 3 (12%)</th>
<th>+RT 6 (24%)</th>
<th>+CT 2 (8%)</th>
<th>+RT + CT 9 (36%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No surgery</td>
<td>CT + RT 2 (8%)</td>
<td>CT 1 (4%)</td>
<td>RT 1 (4%)</td>
<td>Symptomatic 1 (4%)</td>
</tr>
</tbody>
</table>

CT: chemotherapy; RT: radiotherapy.

### Treatment

In 80% of patients (20/25), treatment included surgical resection of the tumour. The analysis of the resection specimen showed the existence of tumour-free margins in 55% of cases (11 patients), whereas the margins were close or affected in the remaining 45%. Surgery was associated with an adjuvant treatment in most cases: it was supplemented with radiotherapy in 15 cases (75%) and with chemotherapy in 11 (55%).

Surgery was not used in 5 cases: 2 patients with rhabdomyosarcoma who were treated with chemotherapy and radiotherapy with radical intent, and 3 cases in which treatment with chemotherapy (1 case), radiotherapy (1 case) or supportive measures (1 case) could be considered as palliative care. The chemotherapy patterns used varied greatly, with CYVADIC (cyclophosphamide, vincristine, doxorubicin [adriamycin] and dacarbazine) being the most common in adults, and IVA (ifosfamide, vincristine and actinomycin) in children.

Table 2 details the therapeutic sequences used in the 25 patients with head and neck sarcomas.

### Disease Control and Survival

We achieved control of the disease in only 1 case of the 5 in which the therapeutic sequence did not include surgery. It was a girl of 5 years of age suffering from rhabdomyosarcoma of the temporal petrosal, treated with chemotherapy and radiotherapy and who is disease-free more than 10 years after completing the treatment. The other 4 patients who did not follow surgical treatment died as a consequence of disease progression.

Local control of the disease was achieved with the initial surgical manoeuvre in 45% of cases (9/20) of patients undergoing surgery. The percentage of patients who achieved local control of the disease was higher for the group of patients in whom disease-free margins were obtained (55%) than in those in whom resection limits were near or affected (33%).

Surgical rescue was attempted, sometimes supplemented by chemotherapy and/or radiotherapy, in 8 of the 11 patients with local recurrence of the disease. Final control of the malignancy was achieved on 3 occasions.
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Local control of the disease was achieved. Control of the therapeutic manoeuvre employed, was 52% (13/25). Lymph node metastases (2 cases) or distant metastases (1 case) appeared during follow-up in 3 patients in whom local control of the disease was achieved. Control of the disease was not obtained in any of these cases.

Figure 1 shows the adjusted actuarial survival curve for the study patients. Adjusted survival at 5 years was 51.2% (95% CI: 30.5%-71.9%). We noted the appearance of 2 cases of late tumour recurrence (1 patient with rhabdomyosarcoma and another with synovial sarcoma), which could not be rescued and which justified a drop down to 32% in survival rate at 12 years, as shown in the figure.

Discussion

In our geographical area, a southern European country with a high incidence of squamous cell carcinomas associated with tobacco and alcohol consumption, sarcomas represent a very small proportion of patients with malignant head and neck tumours. Of the total 5,216 malignant head and neck tumours diagnosed and treated at our centre between 1985 and 2010, only 0.5% were sarcomas. The aim of our study was to conduct a review of the clinical characteristics and results of this group of patients.

One problem in evaluating patients with sarcomas located in the head and neck region is the absence of a valid classification system for these tumours. According to the TNM (tumour, node and metastasis) classification of sarcomas, the T category is defined based on tumour size (greater or smaller than 5 cm) and whether it is a superficial or deep tumour. While this method of classification can be useful for the limbs, it is clear that applying it at the head and neck level is more difficult. On the one hand, the high density of important organs and structures existing in the head and neck region makes an adequate resection with wide margins very complicated, even in the case of small tumours. On the other hand, given the arrangement of the fascial structures in the head and neck, the great majority of tumours affect superficial fascia or appear in deep spaces so that this criterion would likewise have little prognostic value.

Table 3 summarises the characteristics of sarcomas in the head and neck region reported by various authors. As can be observed, there is a notable disparity in the results presented in the various series published. In general, the average age of patients ranges between 50 and 60 years, with a predominance of the male gender, a very heterogeneous distribution in terms of location and histology of the tumours on the series studied, with a tendency towards the diagnosis of high-grade tumours, and a predominance of tumours with volumes below 5 cm. In relation to existing data in the literature, the data from our series contains a lower mean age and a higher proportion in the diagnosis of large tumours. The differences in terms of the mean age of patients could be justified by the fact that some of the series published exclude embryonic rhabdomyosarcoma. This is because the natural history of these tumours is different from that of other sarcomas, being tumours that mainly affect the paediatric population. Table 4 summarises the type of treatment used and the results obtained in different series that have analysed patients with sarcomas located in the head and neck region. In general, the type of treatment employed most commonly was surgery, usually complemented with radiotherapy. Adjuvant radiotherapy is recommended as complementary therapy in large tumours, with high histological grade, positive margins after excision and for certain histological variants. It has been shown that local recurrence in head and neck sarcomas is higher than in the retroperitoneum and the limbs, possibly as a consequence of the fact that achieving negative margins during surgical excision is more complex in the case of head and neck sarcomas. Regardless of the location and size of the tumour, one of the most significant prognostic factors in the case of sarcomas refers to the histological grade of the tumour.

According to the results obtained by different authors, the percentages of local disease control ranged between 60% and 70%. Barker et al. reported that in 14 of the 19 patients who suffered locoregional recurrence (74%) of the disease considered candidates for rescue treatment, they achieved final control of the disease in 9 patients (47%). In our results, the percentage of patients who suffered a local recurrence of the disease and could be controlled with rescue therapy was 27%.

The adjusted survival reported in the literature ranged between 60% and 72%, with very similar survival rates being observed. This indicates that mortality in these patients depends largely on a failure to control the disease.

With a median follow-up period of 4.9 years, adjusted actuarial survival at 5 years for patients in our series was 51%. Some authors (Kraus) have indicated that the large majority of failures after treatment of sarcomas appeared during the first 3 years of follow-up, so that the data at 5 years could be considered mature in this type of tumour. However, we noted the appearance of two cases of late local tumour recurrence in our study, which conditioned a notable decrease in long-term adjusted survival.
<table>
<thead>
<tr>
<th>Author</th>
<th>Study period</th>
<th>Number of patients</th>
<th>Mean age</th>
<th>Age range</th>
<th>Male/female ratio</th>
<th>Location, %</th>
<th>Histological grade, %</th>
<th>Size, %</th>
<th>Histology, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willers H et al. MGH</td>
<td>1957–1993</td>
<td>57</td>
<td>55</td>
<td>21–85</td>
<td>2.8/1</td>
<td>Cervical 32</td>
<td>Low 28</td>
<td>≤5 cm</td>
<td>Malignant fibrous histiocytoma 25</td>
</tr>
<tr>
<td>Dudath SB et al. TMH</td>
<td>1981–1995</td>
<td>72</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Others 68</td>
<td>High 16</td>
<td>No data 3</td>
<td>Neurogenic sarcoma 16</td>
</tr>
<tr>
<td>Kraus DH et al. MSKCC</td>
<td>1980–1988</td>
<td>60</td>
<td>49</td>
<td>18–82</td>
<td>2.4/1</td>
<td>–</td>
<td>No data</td>
<td>No data 14</td>
<td>Dermatofibrosarcoma 10</td>
</tr>
<tr>
<td>Le Vay J et al. PMH</td>
<td>1961–1993</td>
<td>52</td>
<td>52</td>
<td>15–93</td>
<td>1.1/1</td>
<td>–</td>
<td>–</td>
<td>No data</td>
<td>Fibrosarcoma 9</td>
</tr>
<tr>
<td>Le QT et al. UCSF</td>
<td>1961–1993</td>
<td>65</td>
<td>55</td>
<td>18–87</td>
<td>1.5/1</td>
<td>–</td>
<td>–</td>
<td>No data 14</td>
<td>Leiomyosarcoma 7</td>
</tr>
<tr>
<td>Dijkstra MD et al. NCI</td>
<td>1963–1993</td>
<td>58</td>
<td>50</td>
<td>18–85</td>
<td>1.9/1</td>
<td>–</td>
<td>–</td>
<td>No data 13</td>
<td>Liposarcoma 5</td>
</tr>
<tr>
<td>De Bree. R et al. VUUMC</td>
<td>1983–2004</td>
<td>38</td>
<td>56</td>
<td>18–88</td>
<td>0.7/1</td>
<td>–</td>
<td>–</td>
<td>No data 19</td>
<td>Epithelioid sarcoma 2</td>
</tr>
</tbody>
</table>

Table 3  Clinical Characteristics of Patients With Head and Neck Sarcomas in the Different Series Published.
Table 4  Types of Treatment Employed and Results Obtained in Patients With Head and Neck Sarcomas in the Different Series Published.

<table>
<thead>
<tr>
<th>Author</th>
<th>Study period</th>
<th>Number of patients</th>
<th>Mean follow-up, years</th>
<th>With no prior treatment, %</th>
<th>Treatment</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Surgery</td>
<td>Local control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66%</td>
<td>60% 5a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Surgery + RT</td>
<td>77%</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>77%</td>
<td>57%</td>
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<td></td>
<td></td>
<td>RT</td>
<td>74%</td>
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<td></td>
<td>23%</td>
<td>72%</td>
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<td></td>
<td></td>
<td></td>
<td>Adjuvant CT</td>
<td>12%</td>
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<td></td>
<td></td>
<td></td>
<td>12%</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mx: distant metastasis; CT: chemotherapy; RT: radiotherapy; Sv: survival.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a Raw data at the end of follow-up (the others, if not indicated, indicate at 5 years).</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

Head and neck sarcomas are a heterogeneous group of malignant tumours with high variability in clinical presentation, histopathological classification and biological characteristics. The treatment of choice for most sarcomas includes surgical resection, supplemented with adjuvant radiotherapy and chemotherapy depending on the extension, the resection margins achieved by surgery and the histological grade of the tumour.

The adjusted survival achieved in a group of 25 patients with head and neck sarcomas treated at our centre over a period of 25 years reached 51% at 5 years, decreasing to 32% at 12 years due to late recurrences of the disease.

Conflict of Interests

The authors have no conflicts of interest to declare.

References