DOI: http://dx.doi.org/10.1590/1413-785220223005e256403

EPIDEMIOLOGICAL DISTRIBUTION OF SOFT PART TUMORS IN A TERTIARY HOSPITAL

DISTRIBUIÇÃO EPIDEMIOLÓGICA DE TUMORES DE PARTES MOLES EM UM HOSPITAL TERCIÁRIO

Maria Júlia Palitot de Melo[1], Gabriel Greggio Secco Felix[1], Márcio Gomes de Barros[2], Henrique Carvalho e Silva Figueiredo[2], João Raphael Fernandes Denardi[2], João Batista Pereira Neto[2], Luciano Agusto Reganin[3]

1. Pontifícia Universidade Católica de Campinas, School of Medicine, Campinas, SP, Brazil.
2. Hospital PUC-Campinas, Medical Residency Service in Orthopedics and Traumatology, Campinas, SP, Brazil.
3. Hospital PUC-Campinas, Department of Tumor, Orthopedics and Traumatology Service, Campinas, SP, Brazil.

ABSTRACT

Objective: To evaluate cases of soft tissue tumors at the Orthopedic Oncology service of the PUC-Campinas Hospital and determine the epidemiological profile in the period from February 2012 to November 2019, associating the participation of a non-reference hospital in the approach and treatment of the pathology. Methods: This study evaluated 72 patients aged 18 to 81 years, of both sexes and diagnosed with soft tissue tumor and divided into two groups: (I) primary etiology and (II) metastatic etiology. Results: Of 146 patients admitted, 22 resulted in deaths, with 9 patients from Group I, and 13 from Group II. For all patients with soft tissue tumor, aged between 51 and 58 years, admitted in the period, the probability of survival after 46 months was 71.84%, Group I's was 22.7% and Group II's 91.43%. Conclusion: Despite the scarcity of epidemiological data related to soft tissue tumor, the data appreciated in the hospital's service, not a reference in treating this type of condition, are compatible with the data presented in specialized hospitals in Brazil, thus, in confluence with the literature. ***Level of Evidence III, Comparative, Prognostic and Retrospective Study.***

Keywords: Sarcoma. Soft Tissue Neoplasms. Epidemiology. Neoplasms.

RESUMO

Objetivo: Avaliar casos de tumores de partes moles do Serviço de Oncologia Ortopédica do Hospital PUC-Campinas e determinar o perfil epidemiológico no período de fevereiro de 2012 a novembro de 2019, associando à participação de um hospital que não é referência na abordagem e tratamento da patologia. Métodos: Foi realizada uma análise exploratória de dados com 72 pacientes entre 18 e 81 anos, de ambos os sexos e com diagnóstico de tumor de partes moles. Eles foram avaliados e divididos em dois grupos: (I) de etiologia primária e (II) de etiologia metastática Resultados: Do total de 146 pacientes admitidos, 22 vieram a óbito, sendo 9 pacientes do Grupo I, e 13 do Grupo II. Para todos os pacientes com tumor de partes moles, com idade entre 51 e 58 anos, admitidos no período, a probabilidade de sobrevida após 46 meses foi de 71,84%, enquanto do Grupo I foi de 22,7%, e do Grupo II foi de 91,43%. Conclusão: Apesar da escassez de dados epidemiológicos relacionados ao tumor de partes moles, os dados apreciados no serviço do hospital, que não é referência no tratamento dessa condição, são compatíveis com os dados apresentados em hospitais especializados no Brasil, assim, corroborando a literatura. ***Nível de Evidência III, Estudo Retrospectivo Comparativo Prognóstico.***

Descritores: *Sarcoma. Neoplasias de Tecidos Moles. Epidemiologia. Neoplasias.*

Citation: Palitot de Melo MJ, Felix GGS, Barros MG, Figueiredo HCS, Denardi JRF, Pereira Neto JB, Reganin LA. Epidemiological distribution of soft part tumors in a tertiary hospital. Acta Ortop Bras. [online]. 2022;30(5): Page 1 of 5. Available from URL: http://www.scielo.br/aob.

INTRODUCTION

Cancer is an important public health problem, mainly due to increase in its incidence and its high mortality rate, and treatment is recommended in reference centers specialized in oncology. However, gaps in epidemiological information exist in private and public agencies when it comes to soft tissue sarcoma, both in reference institutions and in non-reference and tertiary hospitals.

Soft tissues are those located between the epidermis and viscera, except for bones, and constitute about 50% of an adult's body weight. Soft tissue sarcomas (STS) are rare malignancies that mimic mesenchymal proliferations and soft tissue components. They account for 1% of all malignant neoplasms in adults and can develop anywhere, although about 40% occur in the lower limbs, especially in the thigh. The main malignant soft tissue tumors are fibrosarcomas and liposarcomas.[1,2]

All authors declare no potential conflict of interest related to this article.

The study was conducted at the Department of Orthopedics and Traumatology of PUC-Campinas Hospital.
Correspondence: Maria Júlia Palitot de Melo. Rua Alzira Marcondes, 225, Campinas, SP, Brazil, 13060562. palitotmedpucc@gmail.com

Article received on 09/15/2021, approved on 11/30/2021.

The cause of soft tissue tumors is unknown. However, predisposing genetic factors have already been identified, as well as extrinsic genetic damage (ionizing radiation, exposure to dioxins, chlorophenol and some viruses, such as HIV).[1-3]
Presence of tumor accompanied or not by pain is the main clinical manifestation. Tumor samples can be obtained by percutaneous or incisional biopsy. Diagnoses included histopathology, neoplasm staging and immunohistochemical study.[1-3]
The degree of histological differentiation of the primary tumor, its size and the presence or absence of metastasis are the main prognostic factors related to STS. According to staging, stage I tumors present low histological grade, accounting for about 15% of all sarcomas and usually remain localized. Stage II and III sarcomas are considered high-grade tumors (especially those with evident necrosis) and tend to spread rapidly, although without lymph node involvement, and account for the remaining 85%. Usually of recurrent character. Stage IV is represented by metastatic dissemination.[3-5]
Treatment of extremity sarcomas should be performed in specialized institutions, supported by a multidisciplinary team composed of surgeons, clinical oncologists, radiotherapists, pathologists, radiologists, orthopedists, physical therapists, prosthetics specialists, etc.[4-6]
Distant metastasis is the main cause of death of patients with STS. In patients with high-grade sarcoma, the incidence of distant metastasis is 40% and the relative overall survival rate at 5 years is about 50%.[6,7]
Little is known about the epidemiology of STS in Brazil, reflecting the unusual nature of these lesions. Regarding sex, the man-woman ratio is 1:1. The overall annual incidence varies according to age, being 20.7% in patients under 40 years of age, 27.6% among patients aged 40 to 60 years and 51.7% in patients over 60 years. Regarding race, American statistics show a higher number of cases in Caucasian patients (87%), followed by African Americans (10%) and other races (4%).[8,9]
In Brazil, according to DATASUS data, between 1996 and 2005, standardized mortality rates due to STS increased. At the A. C. Camargo Hospital – São Paulo, between 1953 and 1970, from the total number of patients attended, only 628 (2.0%) were sarcomas. At Araújo Jorge Hospital (HAJ) – Goiânia, between 1996 and 2000, 215 patients diagnosed with STS were admitted, 60.9% of high-grade and 39.1% low-grade. In the Clinics Hospital of Porto Alegre, between October 2006 and 2011, 141 patients were admitted, with a mean age of 52 years and the most frequent location in lower limbs (LL – 40%).[1-3]
Regarding STS in Brazil, we verified the presence of scarce and inconclusive epidemiological data no up-to-date records exist, nor that they incorporate non-reference treatment hospitals into statistics.[1,2,10-19]
The objective of this study is to retrospectively evaluate the cases of soft tissue tumors of the Orthopedic Oncology service of the Hospital and determine the epidemiological profile of soft tissue neoplasms service from February 2012 to November 2019, associating the participation of a non-reference hospital in the approach and treatment of the pathology. The results can contribute to the reliability and dissemination of more targeted epidemiological statistics, fostering the scarce collection of data provided by the scientific community.

METHODS

This cross-sectional, analytical, retrospective and observational study used data from the database of the Orthopedic Outpatient Clinic of the Orthopedic Oncology Group of the PUC-Campinas Hospital. We evaluated 72 patients aged between 18 and 81 years admitted between February 2012 and November 2019, as well as the collection in the total number of patients admitted in the same period with the same pathology.
Cases were divided into two groups: Group I for patients with soft tissue tumor of primary etiology and; Group II for patients with soft tissue tumor of metastatic etiology.
Survival function was calculated using the Kaplan-Meier method. Summary measurements and the construction of tables and graphs were used to analyze exploratory data.
The statistical analysis consisted of a descriptive study, carried out in the statistical software R version 2.4.0.
The research protocol was approved by the Research Ethics Committee with opinion number CAAE 39067920.1.0000.5481.

RESULTS

From February 2012 to November 2019, we had a total of 146 patients admitted to the service with diagnosis (current or prior) of soft tissue tumor, 153 new patients and 13 patients with multiple hospitalizations associated with adjacent or metastatic tumors, corresponding to 8.90% of the total patients.
We used the 153 new patients admitted to the service with diagnosis (current or prior) of soft tissue tumor for analysis, excluding 13 patients who had multiple hospitalizations, and taking note of 3 patients lost during the period, whose information was censored. Admissions of patients categorized as return and/or exams were not counted.
Between February 2012 and November 2019, the mean distribution of admission of new patients was 19.12 people admitted per year, with a maximum of 27 and a minimum of 14. The standard deviation of the sample was 3.98 patients per year.

New patients' distribution of admission

Regarding the biological sex of patients who entered the service during the period studied, 39 (54.16%) were men and 33 (45.83%) women. Self-declared sex data were not obtained.
The ethnic profile consisted of 32 (44.45%) whites, 27 (37.50%) brown patients, 9 (12.50%) blacks and 4 others (5.55%).
Regarding the age of diagnosis, the mean was 53.24 years, and the standard deviation was 13.68 years, with a minimum of 26 years and a maximum of 81 years. The sample mode was unimodal (63 years), with a 52-year median, and 55 years as the distribution amplitude.
Regarding the random sample of 72 medical records analyzed, we had a confidence interval with a 95% confidence level, from 51.33 (lower estimate) to 58, 67 years (higher estimate), indicating that the randomly chosen sample is within the population's parameter.

Distribution of patients in the age group of diagnosis

Regarding the origin of the referral, most came from 62.75% the Brazilian Unified Health System (SUS), and the remaining 37.25% from the private system. The specific referral was mostly by SUS hospitalization (38.57%), followed by health insurance (24.83%), outpatient clinics (24.18%), and private way (12.42%). Regarding the hospitalized patients via insurance, we had a virtually equal distribution between 4 contracted services, being the plan's origin mostly in the city of Campinas-SP (about 60.53%) compared to cities up to 200 Km away from the service (39.47%). The mean length of stay was 15.97 days, and the standard deviation was 3.43 days, as shown in Table 1.

Table 1. Data from the referral source.

Referral Source	Brazilian Unified Health System (SUS)	Private system
Specialized forwarding	Hospitalization | Outpatient clinic	Health plan | Private
Relative frequency (%)	38.57% | 24.18%	24.83% | 12.42%
Total	62.75%	37.25%

Regarding the tumor's location, most were located in trunk and extremities (81.24%), 40% of which were located mostly between the femur (right and left) and shoulders. The other most common tumor locations were the humerus, forearm and tibia; however, the medical records could not offer more information about these sites of involvement, thus, it is impossible to associate the location of the tumor in these cases.

Among the patients who presented location of the tumor in the shoulder, we found an association with recurrent dislocations, so it was impossible to correlate a statistical analysis.

Tumor stage classifications were stage I (59.40%), stages II and III (30.80%), and stage IV (9.8%). Data are presented in Table 2.

Regarding the most recurrent soft tissue tumor types, lipoma and osteochondroma of femur diagnoses were the most common. A more detailed analysis was impossible given the lack of archiving of immunohistochemical tests.

Among female patients with a soft tissue tumor diagnosis, we found that 71.02% had ligation or hysterectomy surgeries and/or previous history of breast cancer, and it was impossible to correlate these data with each other and/or with the sample group.

Regarding the treatment techniques used in the service, 63.89% of the patients analyzed presented a complete surgical description in their medical records: 10.40% of these patients performed a diagnostic biopsy and tumor resection concomitantly; 15% of these patients underwent bone and soft tissue resection surgery concomitantly, 29.50% of these patients underwent only soft tissue resection. Of the patients with surgical records analyzed, 9.10% had a diagnosis of adjacent lymph nodes affected by the tumor.

DISCUSSION

From the deaths of the period studied we have: 22 deaths in total, of which 9 were of patients in Group I, with tumor of secondary and metastatic etiology, and 13 of Group II, with tumor of primary etiology, without metastases. Regarding living patients, the results were 4 patients from Group I and 127 in Group II. Therefore, the analysis consisted of 13 patients belonging to Group I and 140 patients belonging to Group II. Patients in Group I were responsible for all re-hospitalizations in the service during the period, as shown in Table 3.

According to the Kaplan-Meier survival analysis method, the probability of surviving 46 months after diagnosis for all patients diagnosed with soft tissue tumor was 0.98, whereas the conditional probability of death was 0.02.

The accumulated survival at 46 months of diagnosis is 0.072, therefore, the probability of a patient with soft tissue tumor being alive after 46 months of diagnosis is approximately 71.85%, as shown in Table 4.

Table 4 shows the calculation of accumulated survival at 46 months, estimating the probability of survival in 5 years of diagnosis. From the 153 new hospitalized patients, 23 died and 3 were censored (interventions or loss of follow-up).

The probability of survival 46 months after diagnosis of patients in Group I was 0.33, whereas the conditional probability of death was 0.67. For that reason, the accumulated survival at 46 months of diagnosis in Group I is 22.7% (Table 5).

The probability of survival 46 months after the diagnosis of patients in Group II was 0.992, while the conditional probability of death was 0.007. Therefore, the accumulated survival at 46 months of diagnosis in Group II is 91.43% (Table 6).

We can thus infer that, for all patients with soft tissue tumor, of both sexes, and aged between 51 and 58 years, admitted and diagnosed at the hospital service in Campinas, São Paulo, between 2012 and 2019, the probability of survival after 46 months was 71.84%. The probability of survival after 46 months in Group I (patients with metastasis) was 22.7%, compared to Group II's (patients without metastasis) 91.43%.

Table 2. Stages of tumor classification.

Classification	Patients analyzed
Stage I	43 (59.4%)
Stage II and III	22 (30.8%)
Stage IV	7 (9.8%)
Total	72 (100%)

Table 3. Profile of re-hospitalizations of diagnosed patients.

Patient situation	Group I (Secondary etiology, with metastasis)	Group II (Primary etiology, without metastasis)	Total
Deaths	9	13	22
Non-deaths	4	127	131
Total	13	140	153

Table 4. Overall survival rates.

Months after diagnosis (i)	Number of individuals alive at the beginning of the month (li)	Deaths (di)	Censuring (wi)	Conditional probability of death (qi = di/li)	Conditional probability of survival (pi = 1 − qi)	Cumulative probability of survival S(ti)	Survival rate of all studied groups
0	153	1	1	0.0065359	0.9934641	0.9934641	99.4%
1	152	1	1	0.0065789	0.9934211	0.9803055	98.0%
2	151	2	1	0.0132450	0.9867550	0.9673214	96.7%
6	149	2	1	0.0134228	0.9865772	0.9543372	95.4%
12	147	1	0	0.0068027	0.9931973	0.9478451	94.8%
14	146	1	1	0.0068493	0.9931507	0.0941353	94.1%
18	145	1	1	0.0068966	0.9931034	0.0934795	93.5%
20	144	1	0	0.0069444	0.9930556	0.9283039	92.8%
26	143	1	1	0.0069930	0.9930070	0.0921812	92.2%
28	142	1	1	0.0070423	0.9929577	0.0915321	91.5%
34	139	3	1	0.0215827	0.9784173	0.0895565	89.5%
36	137	2	1	0.1666667	0.8333333	0.0746304	74.6%
40	134	2	0	0.0149254	0.9850746	0.0735165	73.5%
44	133	1	1	0.0075188	0.9924812	0.0729638	72.9%
46	131	2	1	0.0152672	0.9847328	0.07184986	71.8%

Table 5. Group I survival rates.

Months after diagnosis (i1)	Number of individuals alive at the beginning of the month (li1)	Deaths (di1)	Censuring (wi1)	Conditional probability of death (qi1 = di1/li1)	Conditional probability of survival (pi1 = 1 − qi1)	Cumulative probability of survival S(ti1)	Group I survival rate
0	13	1	1	0.079	0.921	0.921	92.1%
2	12	1	1	0.083	0.917	0.844	84.4%
12	11	1	0	0.09	0.91	0.768	76.8%
18	10	1	1	0.1	0.9	0.683	68.3%
20	9	1	0	0.111	0.889	0.607	60.7%
34	8	2	1	0.25	0.75	0.455	45.5%
36	6	2	1	0.333	0.667	0.227	27.7%

Table 6. Group II survival rates.

Months after diagnosis (i2)	Number of individuals alive at the beginning of the month (li2)	Deaths (di2)	Censuring (wi2)	Conditional probability of death (qi2 = di2/li2)	Conditional probability of survival (pi2 = 1 − qi2)	Cumulative probability of survival S(ti2)	Group II survival rate
1	140	1	1	0.00714285	0.99285715	0.99285715	99.3%
2	139	1	1	0.00719424	0.99280576	0.985714297	98.6%
6	138	1	1	0.00724376	0.99275624	0.978574019	97.8%
14	137	1	1	0.00729927	0.99264706	0.971378624	97.1%
26	136	1	1	0.00735294	0.9925926	0.964183234	96.4%
28	135	1	1	0.0074074	0.99273134	0.957174914	95.7%
34	134	1	1	0.007426866	0.992573134	0.950066104	95.0%
36	133	1	1	0.007518797	0.992481203	0.942922729	94.3%
40	132	2	0	0.01515152	0.98484848	0.92836037	92.9%
44	130	1	1	0.0076923	0.9923077	0.92149269	92.2%
46	129	2	1	0.00775193	0.99224807	0.91434933	91.5%

CONCLUSION

This study considered a total of 146 patients admitted to the service with soft tissue tumor diagnosis, from February 2012 to November 2019, being 153 new patients and 13 patients with hospitalizations associated with metastatic tumors, also accounting for 3 censored patients.

Admission distributions of new patients in the period was considered constant.

Regarding biological sex, the estimated proportion for the distribution was 1:1, similar to that described in the literature. The ethnic profile presented a predominance of white and brown patients with access to the service.

The mean age patients with STS was 53.24 years, similar to that described in the literature, due to possible late diagnoses.

Referral was mostly via SUS. Private referrals presented an egalitarian distribution of contracted insurance services, mostly in the city.

The mean length of stay in the service, between first hospitalization and surgery, was 15.97 days, a standard followed and guided by the service.

Regarding the tumor's location, most (81.24%) were in the trunk and extremities, of which 40% were located between the femur (right and left) and shoulders. Among the patients who presented the tumor in the shoulder, we found an association with recurrent dislocations, so it was impossible to correlate a statistical analysis.

Regarding tumor classification, most were stage I (59.40%), demonstrating a diagnosis of the onset of a low-grade tumor, being excellent for a rapid approach and improvement of patient survival. We observed a recurrence of diagnoses of femur lipoma and osteochondroma as the more recurrent soft tissue tumor types.

Regarding the treatment techniques applied in the service, most patients analyzed (29.50%) underwent only soft tissue resection, maintaining a cautious margin of resection.

In the table of deaths, we present the results of patients who developed metastases in relation to the occurrence of death, demonstrating that the risk of patients with metastases evolving to death is highly significant in relation to patients who did not develop them. However, the occurrence of metastases is not an isolated prognostic factor, and further studies are needed.

For all patients with soft tissue tumor analyzed, the probability of survival after 46 months was 71.84%.The probability of survival after 46 months of patients with metastasis was 22.7%, compared to 91.43% of those without metastasis. Thus, patients with metastases have a lower estimated survival than patients without metastasis.

That said, we found that, despite the scarcity of epidemiological data related to soft tissue tumor, the data evaluated in the non-reference hospital service are compatible with the data found in specialized hospitals in Brazil.

AUTHORS' CONTRIBUTIONS: Each author contributed individually and significantly to the development of this article. MJPM: acquisition, analysis or interpretation of the data, writing of the article and final approval of the version of the manuscript to be published; GGSF, MGB, HCSF, JRFD, JBPN: acquisition analysis or interpretation of the data, final approval of the version of the manuscript to be published; LAR: conception and design of the work, critical review of intellectual content, final approval of the version of the manuscript to be published.

REFERENCES

1. Instituto Nacional de Câncer José Alencar Gomes da Silva (BR). Estimativa 2020: incidência de câncer no Brasil. Rio de Janeiro: Inca; 2019.
2. Manoel WJ, Sarmento BJ, Silveira LP Jr, Abreu DC, Abreu Neto IP, Ferreira EC. Sarcomas de alto grau: estudo retrospectivo de 131 casos. Rev Col Bras Cir. 2008;35(2):83-7.
3. Silva EO. Sarcomas de partes moles de extremidades: análise da sobrevida, funcionalidade e qualidade de vida no Rio de Janeiro [master's thesis]. Rio de Janeiro: Fundação Oswaldo Cruz; 2011.
4. Rajput A, Kraybill WG. Clinical trials and soft tissue sarcomas. Surg Oncol Clin N Am. 2003;12(2):485-97.

5. Sobin LH, Wittekind C, editors. TNM classification of malignant tumors. 6th ed. New York: Wiley-Liss; 2002.
6. Manoel WJ, Sarmento BJQ, Silveira LP Jr, Abreu DCB, Abreu Neto IP, Ferreira EC. Sarcomas de partes moles: resultados do tratamento dos tumores de baixo grau. Rev Bras Cancerol. 2008;54(1):17-24.
7. Kumar V, Abbas A, Fausto N, Aster JC. Robbins & Cotran patologia: bases patológicas das doenças. 8th ed. Rio de Janeiro: Elsevier; 2010.
8. Helman LJ, Maki RG. Sarcomas of soft tissue. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, editors. Abeloff's clinical oncology. 5th ed. Philadelphia: Elsevier; 2014. p. 1753-91.
9. MacNeill AJ, Gupta A, Swallow CJ. Randomized controlled trials in soft tissue sarcoma: we are getting there! Surg Oncol Clin N Am. 2017; 26(4):531-44.
10. Simon MA, Springfield DS, editors. Surgery for bone and soft-tissue tumors. Philadelphia: Lippincott-Raven; 1998.
11. American Cancer Society. About soft tissue sarcoma [Internet]. Kennesaw: ACS; [accessed on 2022 Jul 12]. Available from: https://www.cancer.org/content/dam/CRC/PDF/Public/8813.00.pdf
12. Enzinger FM, Weiss SW, editors. Soft tissue tumors. 3rd ed. St Louis: Mosby-Year Book; 1995.
13. Pisters PW, Leung DH, Woodruff J, Shi W, Brennan MF. Analysis of prognostic factors in 1,041 patients with localized soft tissue sarcomas of the extremities. J Clin Oncol. 1996;14(5):1679-89.
14. Santos CER, Rezende JFN, Carvalho GSS, Nunes LF. Sarcomas de partes moles [Internet]. Rio de Janeiro: Cirurgia Online; [accessed on 2022 Jul 12]. Available from: http://www.cirurgiaonline.com.br/site/images/stories/pdf/sarcomas%20de%20partes%20moles%20em%20dermatologia%20(trocar%20por%20este%20atualizado).pdf
15. Hashimoto H. Incidence of soft tissue sarcomas in adults. Curr Top Pathol. 1995;89:1-16.
16. Thomas JM. Surgical biopsy techniques and differential diagnosis of soft tissue tumors. Recent Results Cancer Res. 1995;138:25-9.
17. Ueda T, Aozasa K, Tsujimoto M, Hamada H, Hayashi H, Ono K, Matsumoto K. Multivariate analysis for clinical prognostic factors in 163 patients with soft tissue sarcoma. Cancer. 1988;62(7):1444-50.
18. Hoefkens F, Dehandschutter C, Somville J, Meijnders P, Van Gestel D. Soft tissue sarcoma of the extremities: pending questions on surgery and radiotherapy. Radiat Oncol. 2016;11:136.
19. Duval MAS, Nunes GA, Murari JCL, Spada J, Corleta OC. Sarcomas de partes moles: experiência cirúrgica de cinco anos em hospital escola. Rev HCPA & Fac Med Univ Fed Rio Gd do Sul. 2012;32(3):269-74.