145P Evaluation of clinicopathological features and prognoses of patients with cardiac sarcoma

I. Dogan[1], S. Ileri[2], O. Karhan[3], H. Yerlikaya[4]

[1]Medical Oncology, Acibadem Healthcare Group, Istanbul, Türkiye; [2]Medical Oncology, Gazi Yasargil Research and Treatment Hospital, Diyarbakir, Türkiye; [3]Medical Oncology, Harran University Hospital, Sanliurfa, Türkiye; [4]Medical Oncology, Bati Hospital, Diyarbakır, Türkiye

Background: Primary cardiac sarcomas are exceptionally rare malignant tumors of the heart, representing the most common type of primary cardiac malignancy. Due to their low incidence, knowledge regarding clinicopathological features and prognostic factors remains limited, and evidence-based treatment strategies are limited. The aim of this study was to determine the clinicopathological features and prognosis of patients with cardiac sarcoma.

Methods: This retrospective study utilized data from the Surveillance, Epidemiology, and End Results (SEER) database to identify patients diagnosed with primary cardiac sarcoma between 2000 and 2022. Demographic, clinicopathological, and treatment variables were extracted from the database. Survival outcomes were estimated using Kaplan–Meier analysis, and independent prognostic factors were determined through multivariate Cox proportional hazards regression.

Results: Two hundred and thirty-four patients who met the study criteria were identified and analyzed. The most common sarcoma types were NOS sarcoma (16.7%), giant cell sarcoma (16.7%), leiomyosarcoma (12%), spindle cell sarcoma (9.8%), and synovial sarcoma (9%). Patients were more frequently diagnosed as localized or locally advanced (localized: 40.5%, locally advanced: 30.3%). The most common sites of metastasis in stage 4 patients were bone (8%), lung (8%), brain (4.4%), and liver (2.9%). Cancer-related surgery was performed in 75.9% of patients, 23.1% received radiotherapy, and 42.7% received chemotherapy. The median survival time was 19 months (95% CI, 12.8-25.1). 1-, 3-, and 5-year survival rates were 60.9%, 35.5%, and 21.5%, respectively. Factors affecting survival were evaluated using multivariate analysis and identified as age ($p = 0.007$), gender ($p = 0.799$), sarcoma type ($p = 0.231$), surgery ($p = 0.002$), radiotherapy ($p = 0.774$), chemotherapy ($p = 0.010$), and stage at diagnosis ($p = 0.123$).

Conclusions: In this study, we found that patients with cardiac sarcoma had a poor prognosis at diagnosis. We identified patient age and treatment methods as important parameters affecting disease prognosis. We have demonstrated that patients who are suitable for surgery and those who receive chemotherapy have more favorable prognoses.

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146P Exploratory prognostic modeling in synovial chondrosarcoma using a machine learning approach

D. Turcan, A. Martino

AI, Data and Decision Sciences, Luiss Guido Carli University, Rome, Italy

Background: Synovial chondrosarcoma is a very rare malignant transformation of synovial chondromatosis with aggressive behavior and heterogeneous clinical outcomes. Evidence is largely based on single case reports which limits reliable prognostic modeling. Data driven research methodology approaches may provide a solution by allowing exploratory prognostic modeling in small and imbalanced datasets.

Methods: A dataset of 67 synovial chondrosarcoma cases was extracted from a systematic literature review. Clinical variables included age at diagnosis, sex, primary tumor location, histological subtype, time to malignancy, local recurrence, metastasis, treatment characteristics, and patient outcome classified as no evidence of disease (NED), alive with disease (AWD), or dead of disease (DOD). A Random Forest (RF) classifier was trained in a stratified 3-fold cross-validation (s3FCV) with hyperparameters tuned via Bayesian optimization. In a second experiment, the RF was tested on 5 separate stratified train and test sets, to ensure statistical soundness on previously unseen patients. Model performance was addressed using balanced accuracy (BAC) and Matthews correlation coefficient (MCC). Feature importance analysis was conducted to identify the most influential prognostic variables.

Results: A total of 52 cases with complete outcome data were included in the analysis. The RF after s3FCV achieved a mean BAC of 60%. On the test set, the model reached a BAC of 56% ($\pm$ 3%), with a MCC score of 0.65 ($\pm$ 0.07), which indicates moderate predictive performance. The model classified all 11 of the patients with NED correctly, while partial misclassification was observed between AWD and DOD. Feature importance analysis identified metastasis as the strongest predictor of outcome, followed by time to malignancy, onset site, treatments, type, and age at diagnosis.

Conclusions: These results demonstrate that a machine learning framework can extract meaningful prognostic signals from extremely limited data in synovial chondrosarcoma. This approach offers a solid foundation for exploratory prognostic modeling in other rare sarcomas where traditional statistical methods are constrained by scarce datasets.

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147P Sarcoma C49: A novel prognostic modeling software for survival prediction in soft tissue sarcoma

D.Z. Mamarasulova

Lead of oncology, Andijan State Medical Institute, Andijan, Uzbekistan

Background: Prognostication in soft tissue sarcoma (STS) is complex due to heterogeneous histologies and variable clinical courses. Accurate survival predictions can inform treatment decisions and patient counseling, but no localized tool existed for Uzbek clinical practice. We developed "Sarcoma C49," an artificial intelligence-based software, to predict individualized survival outcomes and assist in treatment planning for STS patients.

Methods: We collected clinical data from STS patients treated in 2015–2021, including demographics, tumor characteristics (site, size, stage, histology, grade) and treatments. Using Java-based programming, we created an Android application and parallel web platform that incorporate statistical models and machine-learning algorithms (Cox regression, logistic classification) to estimate 1-year, 3-year, and 5-year survival probabilities. The model was internally validated with cross-validation and receiver operating characteristic (ROC) analysis to assess predictive performance.

Results: The "Sarcoma C49" software provides an interactive clinician interface that generates patient-specific survival curves and risk estimates. Users input key variables (age, sex, tumor location, size, histologic subtype, grade, treatment modality), and the program outputs the predicted 1-, 3-, 5-year overall survival. For example, a young patient with a small low-grade fibrosarcoma might show an estimated 5-year survival >70%, whereas an elderly patient with metastatic high-grade sarcoma would have a much poorer forecast. The tool also suggests evidence-based treatment options tailored to the case, functioning as a decision-support system.

Conclusions: "Sarcoma C49" is an innovative prognostic tool — the first of its kind in Uzbekistan — enabling personalized survival prediction for STS patients. It leverages local data and machine learning to guide clinical decision-making. This software can help standardize risk assessment, optimize treatment strategies for each patient, and potentially improve outcomes by facilitating timely, appropriate interventions. Integration of such AI-driven tools into oncology practice exemplifies a practical step toward precision medicine in resource-limited settings.

Clinical trial identification: This study is not a clinical trial. It is a retrospective analytical and software development study based on anonymised patient data collected from the Republican Oncology and Radiology Research Center, Tashkent, Uzbekistan (2015–2021).
Therefore, no NIH or equivalent trial protocol number applies.
Institutional approval and registration were obtained from the Republican Oncology Center Ethics Committee, Protocol No. 07/2024, released April 22, 2024.

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148P A unified clinical analysis of localized and metastatic complex-karyotype soft tissue sarcomas: Outcomes and prognostic signals across the disease spectrum

S.E. Ruffini Egea[1], N.P. Pascual de la Fuente[1], P. Trincado Cobos[1], F. Mocha Campillo[2], S.E. Campos Ramirez[1], L.G. Caballero[1], P. Morillas Martínez[1], S. Barriendos Sanz[1], P.G. Mugarza[3], M.L. Monreal Cepero[1], G.M. Guevara[4], E.M. Ortega Izquierdo[5], J. Martinez Trufero[6]

[1]Medical oncology, HospItal Universitario Miguel Servet, Zaragoza, Spain; [2]Department of Medical Oncology, HospItal Universitario Miguel Servet, Zaragoza, Spain; [3]Medical Oncology, HospItal Universitario Miguel Servet, Zaragoza, Spain; [4]Oncology Department, Hospital Universitario Reina Sofía, Cordoba, Spain; [5]Medical Oncology Department, HospItal Universitario Miguel Servet, Zaragoza, Spain; [6]Dept. Medical Oncology, HospItal Universitario Miguel Servet, Zaragoza, Spain

Background: Complex-karyotype soft tissue sarcomas (CK-STS) are mainly treated with similar multidisciplinary approaches. Outcomes across the full range from localized to metastatic disease are rarely reported together. We aimed to describe