FC-136

Is it possible to predict recurrence of giant cell tumor of bone – Our experience and dilemmas?

N. Lujic[1], J. Sopta[2], R. Kovacevic[2], R. Davidovic[3], S. Rajkovic[1], Z. Bascarevic[1], D. Ristic[4]

[1] *Institute for Orthopedic Surgery "Banjica", Belgrade, Serbia*

[2] *Institute for Pathology, Medical Faculty, University of Belgrade, Belgrade, Serbia*

[3] *Department for Radiobiology and Molecular Genetics, Institute of Nuclear Sciences "Vinca", Belgrade, Serbia*

[4] *Institute for Oncology and Radiology of Serbia, Belgrade, Serbia*

Background: Giant cell tumor of bone (GCTB) is a primary bone tumor with unpredictable biological behavior. Our research refers to determining various clinical, radiological and pathohistological parameters which may indicate an increased risk of GCTB recurrence after surgical therapy.

Methods: The analysis included a total of 164 GCTB samples, 118 (72%) were primary tumors, whereas 46 (28%) were recurrences. In the paraffin embedded tissue we analyzed immunohistochemical expression of Ki67, p53, Cyclin D1 and β-catenin.

Results: Out of 16 analyzed clinical, radiological and histological variables, which presented possible predictive factors for the incidence of relapse of GCTB, univariate logistic regression (ULR) was used to extract 4 highly statistically significant parameters: 1) lesion localization, 2) number of surgical interventions, 3) nuclear p53 expression in mononuclear cells, 4) nuclear Cyclin D1 expression in giant multinuclear cells. The multivariate logistic regression (MLR), revealing that p53 expression in mononuclear cells was the most significant predictive factor (HR=6,181 p<0,001), the positivity of which indicated 6 times higher probability for recurrence in GCTB. The expression of Cyclin D1 in giant cells, containing less than 15 nuclei, was also statistically significant (HR=8,398, p=0,038) for predicting the recurrence, and that it demonstrated 8 times more frequent recurrence in positive tumors.

Conclusions: In addition to generally known parameters, such as: localization of lesion, number of surgical interventions, clear destruction of cortex with the presence of extracompartmental lesion and histological criteria for malignancy, the study also found the following independent predictors: p53 expression in mononuclear tumor cells and Cyclin D1 expression in giant multinuclear cells. Clinical Relevance It is necessary to test these results on an even larger sample of patients, so that they, if verified, might resolve the dilemmas in the therapeutic approach to Giant Cell Tumor of Bone.