

Osteosarcoma – lost in translation

A 16-year-old boy with pain around the knee of two months' duration demonstrates a lesion in the epiphysis of the distal femur (long bone). The differential diagnosis may be broad, but the pathologist is able to achieve the diagnosis and let the pediatric oncologist start the therapy. The diagnosis is osteogenic (bone-forming) sarcoma, shortly known as osteosarcoma. In the figure shown below the tumor cells possess a high degree of abnormality of cellular features with evidence of production of new bone. Both criteria need to be present to make the diagnosis of osteosarcoma.

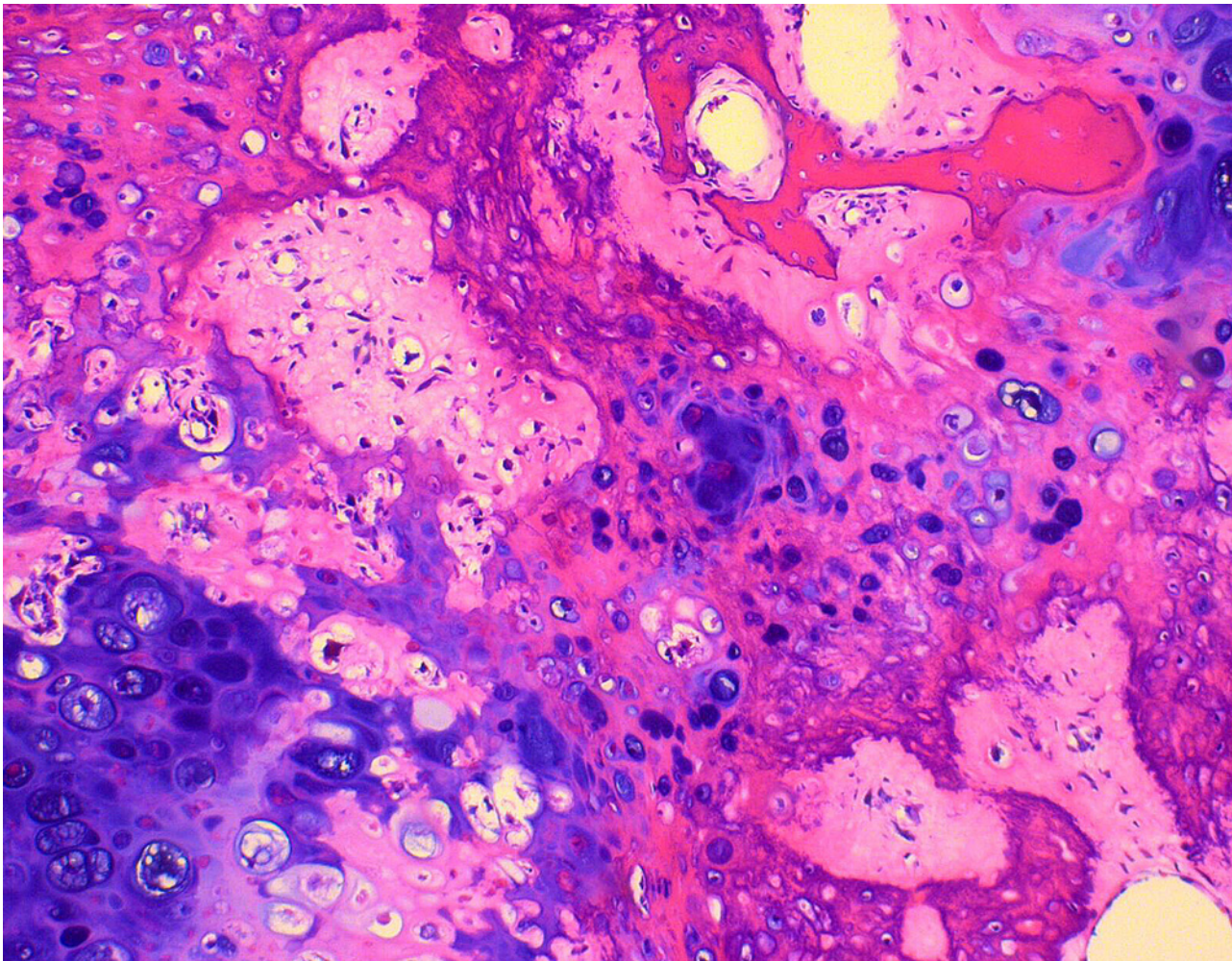


Fig. 1. Malignant tumor cells having a high degree of atypia and the characteristic of forming bone.

OS is the most common primary bone malignancy in childhood and youth. Current treatment strategies have achieved a long-term survival rate of about 60-70% of patients with localized

disease at presentation. Unfortunately, patients with metastatic or relapsed disease have extremely poor prognosis. It is now a good initiative worldwide to stop this tumor for kids. In fact, there is a vigorous activity to identify targetable pathways essential for cancer cell pathophysiology. A crucial role has been demonstrated for some markers in the growth, cell cycle, and apoptosis of human tumors by activating several downstream signaling cascades (e.g. AKT, ERK, PI3K–AKT–TOR and RAF–MAPK pathways). These signaling pathways have been shown to stimulate cell survival mechanisms, inhibit apoptosis (also known as programmed cell death), and promote cell proliferation. In vitro studies demonstrate that some markers rescue cancer cells from chemotherapy-induced apoptosis, and their high expression is associated with a metastatic phenotype. We hope that research funding and an intense scientific activity may help to arrest the growth of this malignant tumor. International cooperation will be key in establishing an effective treatment approach.

Consolato M. Sergi

*Department of Laboratory Medicine and Pathology,
Stollery Children's Hospital, University of Alberta, Edmonton, Canada*

Publication

[Osteogenic Sarcoma: A 21st Century Review.](#)

Osasan S, Zhang M, Shen F, Paul PJ, Persad S, Sergi C
Anticancer Res. 2016 Sep