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Application of Liquid Biopsy in Bone and Soft Tissue Sarcomas: Present and Future

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Abstract

Bone and soft tissue sarcomas account for approximately 1% of adult solid malignancies and 20% of pediatric solid malignancies. Sarcomas are divided into more than 50 subtypes. Each subtype is highly heterogeneous and characterized by significant morphological and phenotypic variability. Currently, sarcoma characterization is based on tissue biopsies. However, primary and invasive tissue biopsies may not accurately reflect the current disease condition following treatment as it may cause marked changes to the tumor cells. Liquid biopsy offers an alternative minimally invasive approach to provide dynamic tumor information, allowing for the application of precision medicine in the treatment of sarcomas. Recently, there have been numerous blood-based tumor components identified by liquid biopsy in sarcomas, including circulating tumor cells, circulating cell-free nucleic acids, tumor-derived exosomes and metabolites in circulation. Here, we summarize the current evolving technologies and then elaborate on emerging novel concepts that may further propel the field of liquid biopsy in sarcomas. We address the applications in the context of our current knowledge about liquid biopsy in sarcomas and highlight the potential of translating these recent advances into the clinic for more effective management strategies for sarcoma patients.

Key words: Bone and soft tissue sarcomas; Circulating tumor cells; Circulating cell-free nucleic acids; Exosomes; Metabolites.

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