CASE STUDY

91. Circulating Tumor DNA as a Tool of Surveillance and Early Indicator of Relapse in Sarcoma Patients

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Background: The use of circulating tumor DNA (ctDNA) has been increasingly explored to monitor treatment response and recurrence surveillance in sarcoma patients. Given the minimally invasive method of measurement via blood samples, and its accuracy and early prediction compared to traditional imaging studies, this method holds promise for implementation as part of patient monitoring following primary treatment. We report our experience in a retrospective series of sarcoma patients where ctDNA was measured in the context of clinical care.

Methods: Retrospective review of five sarcoma patients who were monitored with a tumor-informed ctDNA assay and conventional imaging studies after completing primary treatment was completed.

Results: Patient A: A 36-year-old female was diagnosed with left breast angiosarcoma with liver metastasis. Patient was on pazopanib after initial successful treatment with surgery and chemotherapy. Patient was followed with ctDNA, and 37 days later, ctDNA measurements yielded a positive result (1.25 MTM/mL). Abdomen MRI two months later revealed liver metastasis.

Patient B: A 43-year-old female was diagnosed with metastatic undifferentiated pleomorphic sarcoma. Patient was disease-free for one year after lung metastasectomy but then became positive on ctDNA surveillance (1.31 MTM/mL plasma). Patient had CT imaging two weeks later which showed no disease recurrence. Positive ctDNA levels with negative CT scans led to an additional PET study, confirming recurrence and enabling earlier redirection.

Patient C: A 49-year-old female in remission after treatment for left breast angiosarcoma was followed with ctDNA assays, which yielded a positive result (1.69 MTM/mL). Imaging studies were normal. Subsequent ctDNA showed further ctDNA increase (8.9 MTM/mL). CtDNA increase and negative CT scans led us to order a PET scan, revealing new lesions in the sternum, right sacrum/ilium, and left femur, resulting in early detection of metastatic disease.

Patient D: A 34-year-old male was diagnosed with dedifferentiated chondrosarcoma of the right fibula. The patient completed treatment with surgery and chemotherapy, and ctDNA measurements were negative. Subsequently, a right knee MRI revealed a lesion in the resection bed; core biopsy revealed dedifferentiated chondrosarcoma. Subsequently, ctDNA assay was performed and found to be positive, and radiation was implemented. Follow-up ctDNA subsequently became negative, confirming treatment response.

Patient E: An 81-year-old male was diagnosed with pleomorphic sarcoma of the chest wall and treated with chemotherapy and resection. Patient developed a recurrence five years later and underwent repeat resection. Repeat recurrence one year later coincided with a positive ctDNA result. Patient received systemic chemotherapy with which ctDNA became negative, confirming treatment response.

Conclusion: CtDNA testing demonstrates promising use compared to traditional imaging studies, appearing to indicate early evidence of disease recurrence/progression. In three of five patients, positive ctDNA results revealed signs of recurrence before imaging studies. Three patient's ctDNA levels declined with treatment, correlating ctDNA as a precise indicator of treatment response. Early recurrence detection made possible through ctDNA assay may ultimately improve patient outcomes.

Figure 1. CtDNA Assay Results for Each Patient

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