

## Serial monitoring of circulating tumor DNA in colorectal cancer patients: a case report

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**INTRODUCTION:** Colorectal cancer (CRC) represents one of the leading causes of cancer-related deaths worldwide. Genomic alterations arise during tumor development and they could be used for monitoring the disease. **OBJECTIVE:** Detect chromosomal rearrangements using Next-Generation Sequencing technologies to evaluate its effectiveness as personalized biomarkers for the monitoring of CRC. **MATERIAL AND METHODS:** One patient diagnosed with CRC (pT3N0M1b) who underwent rectosigmoidectomy in the Liga Norteriograndense Contra o Cancer Hospital was selected for follow-up every three months for one year. DNA from tumor tissue was isolated and analyzed using Ion Torrent PGM sequencing. Bioinformatic analysis was applied to detect chromosomal rearrangements. Primer pairs were synthesized for both one of the rearrangements and for the respective unchanged chromosome regions. Serial monitoring of circulating tumor DNA (ct-DNA) was evaluated by Real-Time PCR in plasma samples from the corresponding patient. This procedure aimed to correlate the presence of ct-DNA with possible cancer recurrences and metastasis. **RESULTS AND DISCUSSION:** Among few interchromosomal rearrangements, we were able to identify one (12:10) in ct-DNA from the respective patient. The 12:10 chromosomal rearrangement was observed in the plasma of the patient three and twelve months after surgery, but not detected six months after surgery. These data are in agreement with the FOLFOX chemotherapy after five months of its onset, and with a detected recurrence after cessation of treatment. **CONCLUSION:** The detection of tumor-specific chromosomal rearrangements is applicable to the monitoring of tumor dynamics by the detection of ct-DNA during patient's treatment. We confirm that this is a promising noninvasive blood monitoring strategy in the monitoring of recurrence tumors and metastasis.

Key words: Next-Generation Sequencing, Colorectal cancer, Chromosomal rearrangement

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