

Transit of Circulating Tumor Cells (CTC) Post Radiotherapy at Irradiated Tumor Regions in Pan-cancer Patients

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BACKGROUND

The presence of circulating tumor cells (CTC) is a predictor of minimal residual disease (MRD) and treatment outcome. Recent report showed, the activation of transit of CTCs post simulated radiotherapy from the irradiated regions in vitro. For the first time, we retrospectively analyzed patients who underwent radiotherapy to observe a clinical correlation with presence of CTC with over expression of PD-L1 protein in blood circulation as a minimal residual disease with possible radiotherapy effect.

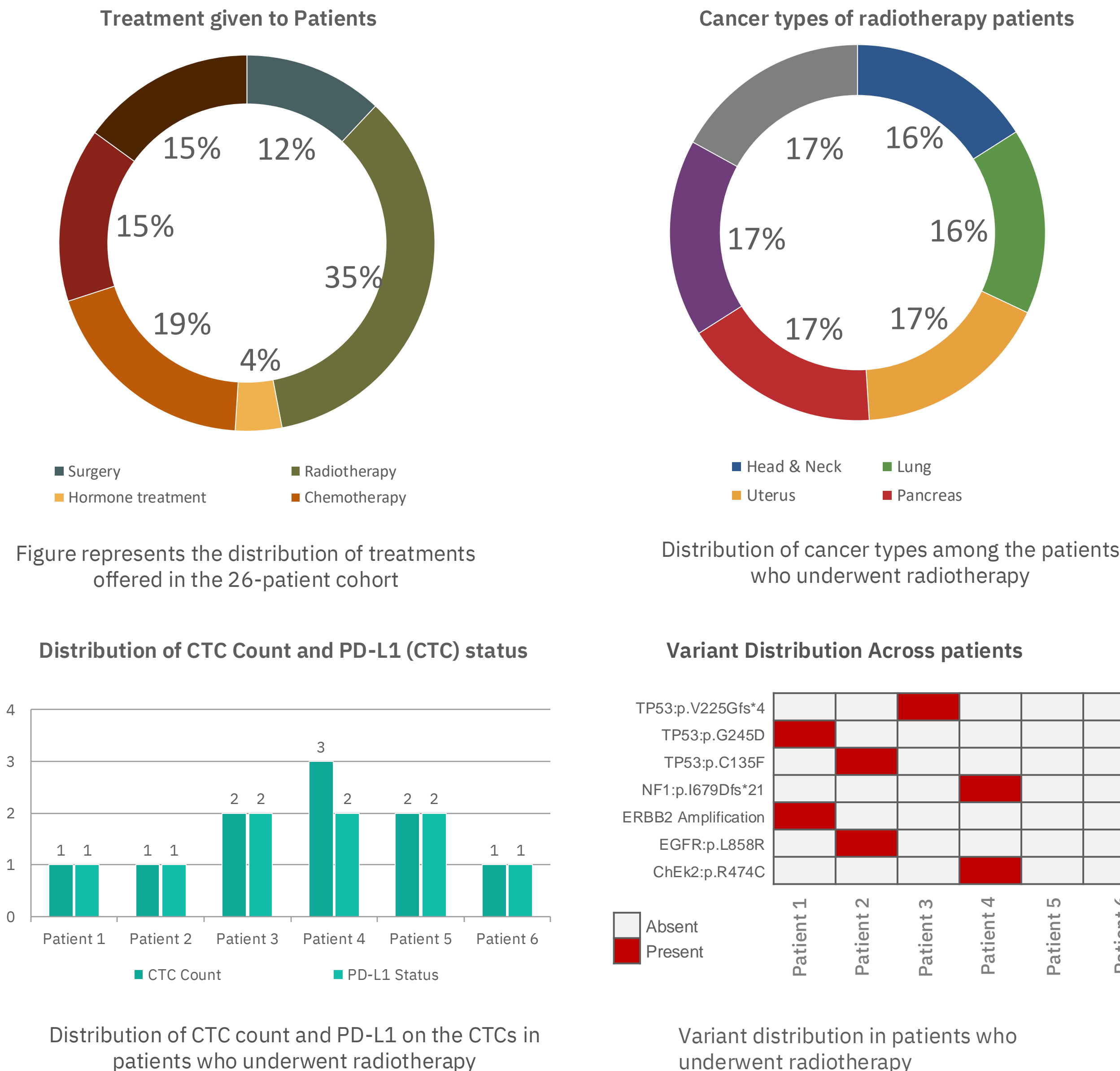
PROBLEM STATEMENT

- Radiotherapy is common among cancer patients in early as well as later stages when the cancer has spread to distant organs.
- Abscopal effects of targeted intraoperative radiotherapy have been observed clinically and tumor microenvironment implicate the outcome.
- Thus, cellular extravasation and invasion phenotype cascade of CTCs in irradiated tumor regions could be highly alarming and impart several clinical questions.

METHODS

A cohort of 26 pan-cancer patients (F 10, M 16) in CRC (n=4), lung (n=4), endometrium (n=4), HNC (n= 4), pancreatic (n= 1), ovary (n=1), RCC (n=4), breast (n= 2), bone (n= 2). Blood samples were analyzed retrospectively based on their clinical/treatment history. Enumeration of CTCs was attained by using immunomagnetic multi-component OncoDiscover platform approved by CDSCO India, mediated by anti EpCAM antibody. CTCs were identified for the presence of CK 18 + ve , PD-L1+ ve, DAPI +ve and CD 45 -ve staining using automated Zeiss Microscope in 1.5 mL of blood sample.

FIGURES



RESULTS

- In retrospective analysis, total of 88% (23/26) patients showed the distribution of CTCs in 1.5 ml of blood.
- Amongst the patients, 46% (n=12/26) had undergone radiotherapy at some point of their treatment history, and 3 patients had focused radiotherapy for brain metastasis with primary head and neck (01) and endometrium cancers (02). 88% (n= 8/9) of patients who underwent radiotherapy were observed with at least 1 CTC as well PD-L1 positive over-expression in at least 1 CTC.
- In addition, 1 patient who underwent radiotherapy showed presence of CTC cluster.

CONCLUSIONS

- For the first time, we show the association of CTCs post radiotherapy at irradiated tumor regions.
- The disseminated CTCs may enhance the tumor cell re-invasion by their active transit in circulation associated with favorable micro-environmental milieu.
- Further validation with more clinical samples in large pan-cancer settings.

**OncoDiscover- Actorius Innovations & Research, India & USA and
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