

INTRODUCTION

ImmunoPET is a multicentre, single arm, phase 1 study, which was initiated to interrogate the dynamics of PD-L1 expression during chemoradiotherapy with PET/CT using 89Zr-durvalumab, a novel PET tracer that directly targets tissues expressing avidity for durvalumab.^{1,2} We present baseline PD-L1 PET/CT results for 14 patients and compare them with baseline immuno-histopathology as reported in the diagnostic report.

METHODS

Design Phase 1 single arm study of 20 patients

Eligibility: NSCLC receiving radical chemoradiotherapy Patients: ECOG 0-1, any histology, PD-L1 expression and EGFR, ALK or ROS mutation status.

Imaging:

- PD-L1 scans were centrally read by 2 experienced nuclear medicine physicians
- Qualitative and quantitative analyses of the PD_L1 PET were performed using MIM imaging software.
- Primary tumour and nodes were contoured using a threshold-based method with SUV cut off above mediastinal blood pool mean on PD-L1 PET/CT.
- Paired FDG PET/CT scans at the same timepoints were analysed using the liver SUVmean+2SD as SUV cut off.

Diagnostic Biopsies:

- Biopsies were stained for PD-L1 using Ventana(SP263) immunohistochemistry (IHC) assays.
- ROS, ALK, EGFR and KRAS were also assessed by IHC and targeted sequencing.

Other Translational Samples

Plasma for cell free DNA analysis was collected before RT, after fraction 1 and after the completion of CRT.

Selected patients underwent sequential EBUS sampling before and after 14 days of radiotherapy treatment.

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- Approximately 30% of patients demonstrated discordance between their initial diagnostic pathology report and imaging.
- Subsequent re-biopsy confirmed that in some patients this may reflect sampling errors.

Future Direction for Research

- Diagnostic cores are being re-stained and rescored to ensure accuracy of the original pathology report
- PD_L1 imaging and cfDNA approaches are being interrogated

REFERENCES & ACKNOWLEDGEMENTS

1. Hegi-Johnson, F. *et al.* *BMJ Open* (2022). <https://doi.org/10.1136/bmjopen-2021-056708>

2. Hegi-Johnson, F. *et al.*. *IJROBP* (2023) <https://doi.org/10.1016/j.ijrobp.2023.05.019>

Registered with Australian Clinical Trial Registry: ACTRN12621000171819)

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Artificial Intelligence (AI) Use Disclaimer

Artificial Intelligence was not used in the production of this poster

RESULTS

Patient	Tumour Biopsy Site	Tissue Histology PD-L1 IHC Score	PD-L1 PET/CT SUVmax at biopsy site	PD-L1 PET/CT Highest SUVmax / site	Overall PD-L1 Imaging Assessment
60 yo Female 317-002	Right hilar (11R)	Squamous Cell <1%	25.2	37.7 / Right lower lobe primary	Discordant with first biopsy
	Repeat 11R biopsy	Adenocarcinoma 70%			Concordant with second biopsy
75 yo Male 317-005	Primary	Adenocarcinoma PD-L1 <1%	16.2	16.2 / primary	Discordant
64 yo Male 317-007	Primary	Adenocarcinoma <1%	24	25.5 / Left paratracheal node	Discordant (large primary with heterogenous uptake)
77 yo Female 317-014	Primary	Adenocarcinoma <1%	13.7 (primary)	14.8 / Right hilar node	Discordant
	Contralateral lymph node Station 7.4L		9.8 (Subcarinal Station 7) 8.0 Left paratracheal (4L)		

Table 1: PD-L1 assessment by baseline tissue diagnosis reported at diagnostic biopsy and imaging. This was discordant in 4/14 of patients initially analysed.

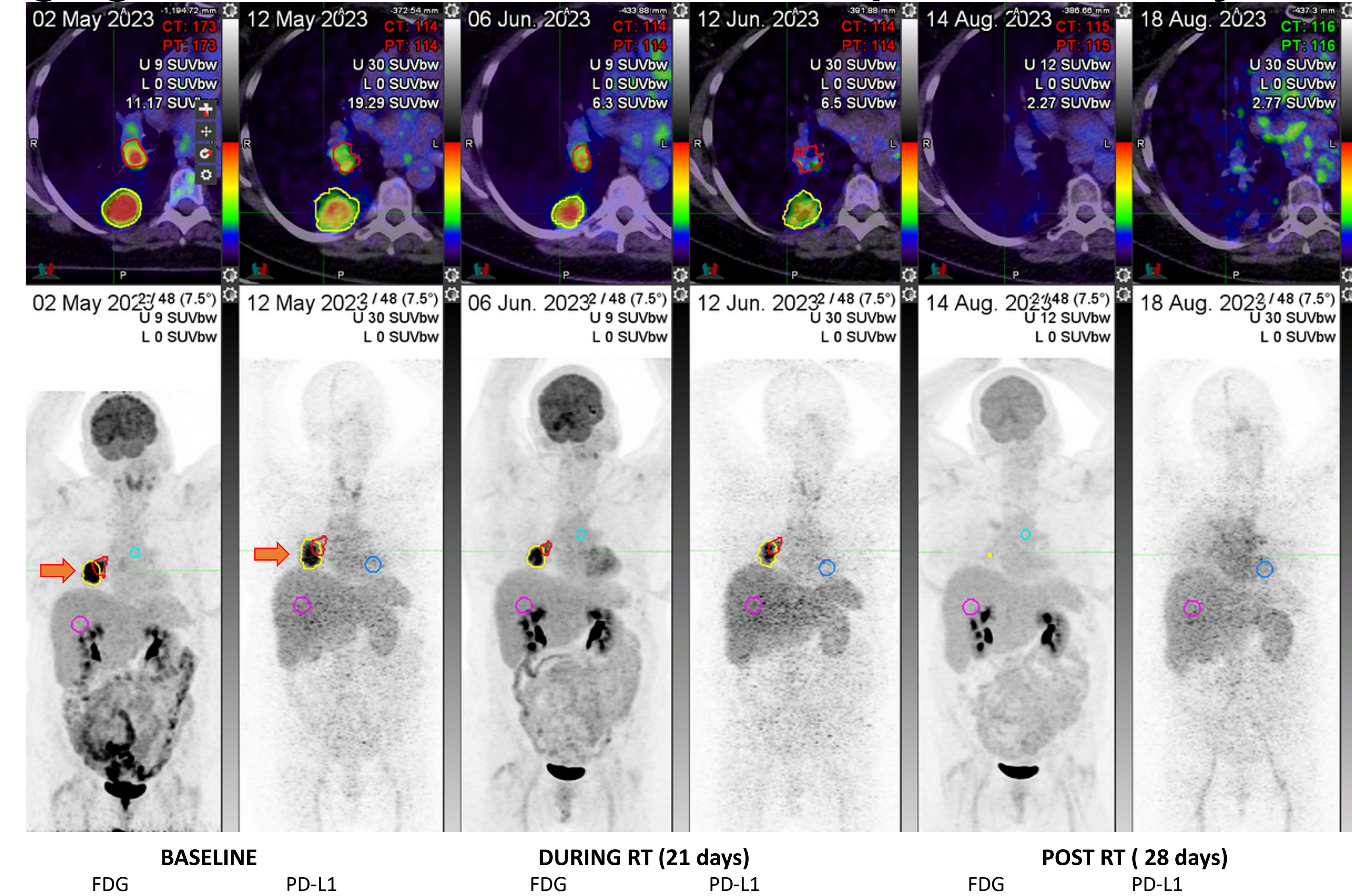


Figure 1: Patient with Discordant Biopsies from Same Site: Diagnostic Biopsy: PD-L1 0 % SCC Repeat biopsy: PD-L1 70% adenocarcinoma. Red arrow indicates biopsy site. Paired FDG PET/CT and PD-L1 PET/CT demonstrate concordant avidity in the primary (yellow contour) and right hilar node (red contour) at baseline, concordant regression during radiotherapy, and resolution post treatment.