# Utility Of Baseline 18F-FDG PET/CT In Prediction Of Response To Chemoradiotherapy In Patients With Unresectable Adenocarcinoma Rectum – A Retrospective Single Centre Experience

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## Introduction

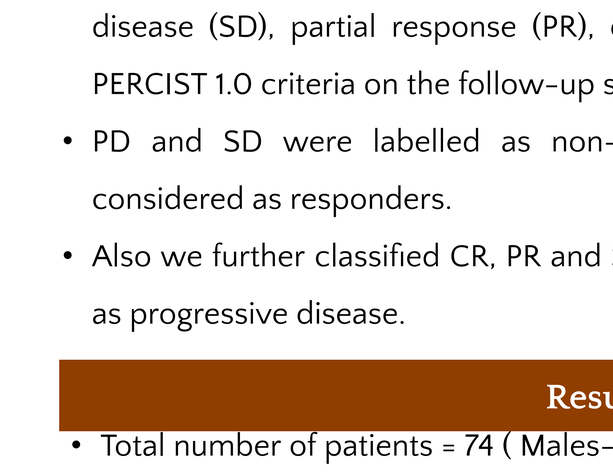
- While surgery is the first line treatment for early-stage adenocarcinoma rectum, the mainstay of treatment for unresectable metastatic disease is chemotherapy and radiation therapy.
- Lack of a reliable biomarker along with inter and intra-tumoral heterogeneity make it difficult to predict the therapeutic outcome in these patients.
- We aim to predict the response in patient with unresectable adenocarcinoma rectum treated with chemo-radiotherapy using

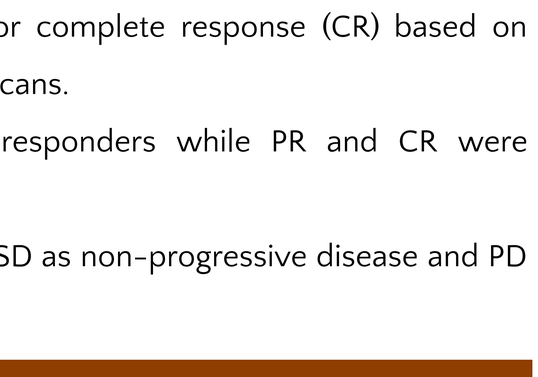
## Materials and Methods

- Data of consecutive patients with histopathologically proven unresectable adenocarcinoma rectum, who underwent 18F-FDG PET/CT in our department from January 2018 and December 2021 and received chemo-radiotherapy were retrospectively assessed.
- Baseline and follow-up PET/CT scans were analyzed by two experienced nuclear medicine physicians.
- SUVmax of both primary lesion and background (mediastinal blood pool) were calculated on the baseline 18F-FDG PET/CT scans to generate the SUV ratio (SUVR).
- The response categories were recorded as progressive disease (PD), stable disease (SD), partial response (PR), or complete response (CR) based on PERCIST 1.0 criteria on the follow-up scans.
- PD and SD were labelled as non-responders while PR and CR were considered as responders.
- Also we further classified CR, PR and SD as non-progressive disease and PD as progressive disease.

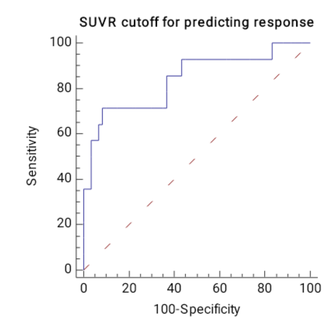
## Results

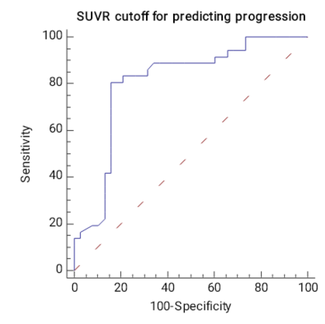
- Total number of patients = 74 ( Males- 49; Females-25)
- The mean age of the patients was 42.3 ± 9.1 years (95% CI- 40.5-44.6)
- .Median SUVR was 9.89 (IQR: 8.5-11.9).
- 14 (19%) patients had PR, 24 (32.4%) had SD and 36 (46.6%) had PD.
- A moderate correlation was observed between SUVR and response criteria (r=0.57, P value <0.05).

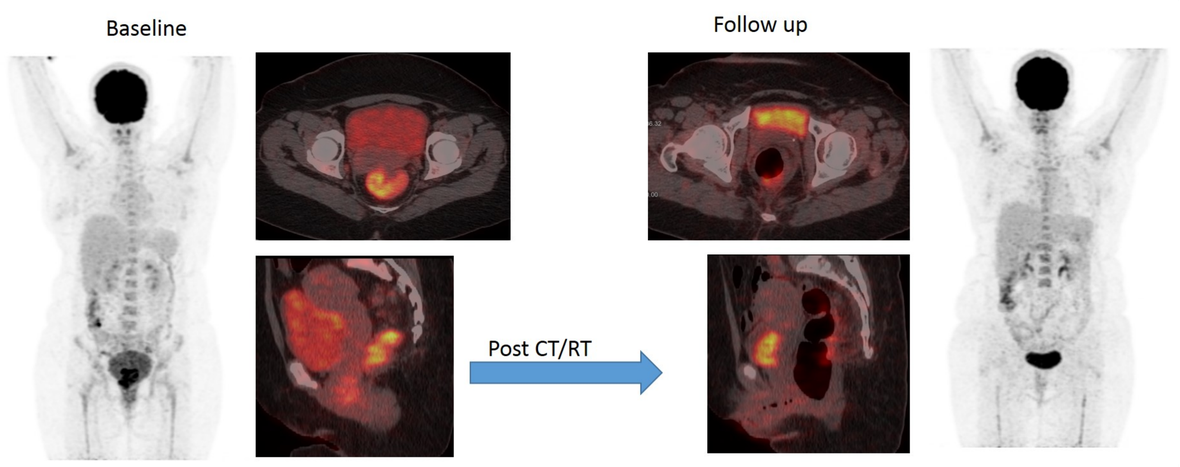


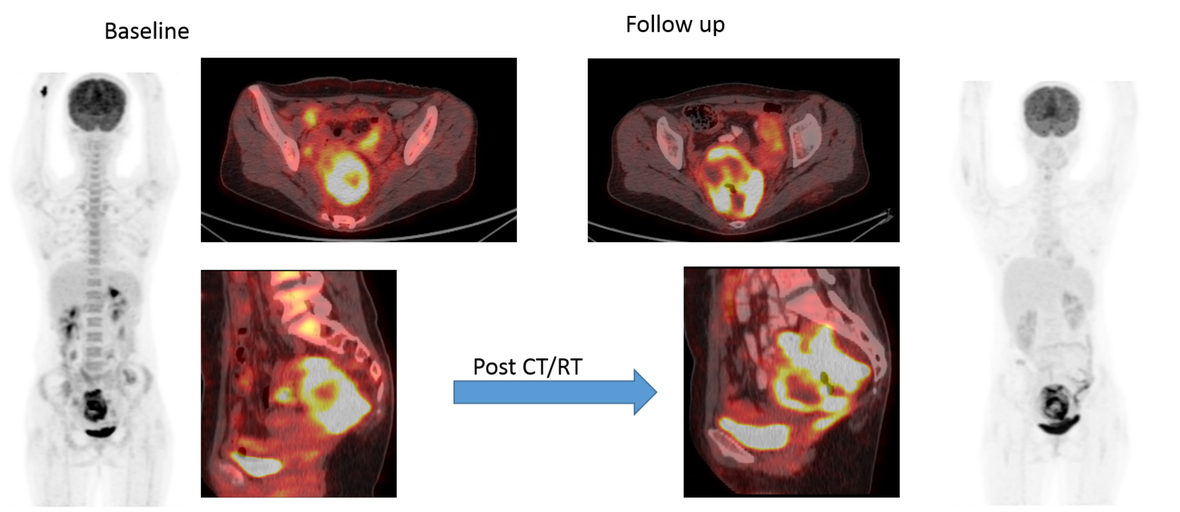

- On receiver operating characteristics curve analysis, an SUVR value less than 5.20 could accurately predict response to chemo-radiotherapy with 84.62% sensitivity and 67.92 % specificity respectively (AUC-0.830; P value=0.01).
- We also found that an SUVR value greater than 10.37 could accurately predict disease progression with 80.6% sensitivity and 84.2% specificity respectively (AUC-0.808; P value=0.01).




A 45 years old female with diagnosis od adenocarcinoma rectum, having a baseline SUVR of 3.2, after chemoradiation therapy, had a partial response on follow up 18F-FDG PET/CT




A 52 years old patient with diagnosis od adenocarcinoma rectum, having a baseline SUVR of 11.9, after chemoradiation therapy, showed disease progression on follow up 18F-FDG PET/CT

## Discussion

- Prediction of treatment response in patients with unresectable adenocarcinoma rectum is challenging due to the lack of robust biomarkers and inter and intra-tumoral heterogeneity.
- Early identification of patients who are at more risk of disease progression will be able to more aggressive treatment regimen.
- However, this should be proven by larger prospective clinical trials.

## Conclusion

In patients with unresectable adenocarcinoma rectum, standardized uptake value ratio on baseline 18F-FDG PET/CT can be useful to predict treatment response to chemo-radiotherapy and predict disease progression.