Role of ^{18}F-FDG PET-CT in the diagnosis and management of Plasma Cell Disorders

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Introduction:

Plasma cells (PC) are terminally differentiated and non-dividing immune cells arising from B cells[1]. Myeloma contributes to 1.8% of all new cases in the US[2]. Various studies have shows the role of ^{18}F-FDG PET-CT in the diagnosis and management of Plasma Cell Disorders, including consensus statement by the International myeloma working group[3].

Objective:

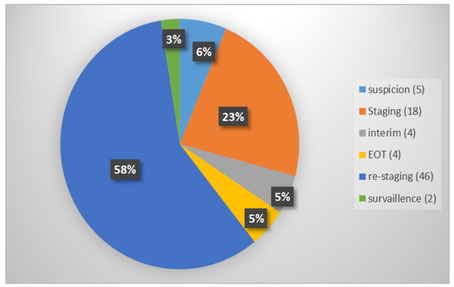
To determine the role of ^{18}F-FDG PET-CT in the diagnosis and management of plasma cell disorders.

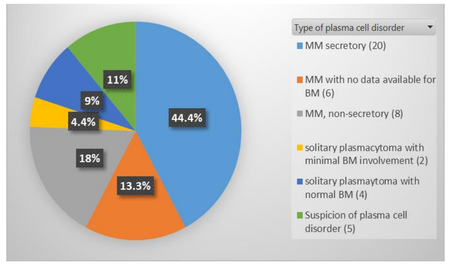
Methods:

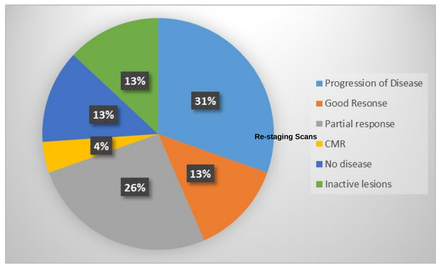
- Retrospective review of ^{18}F-FDG PET-CT in patients with Plasma cell disorder
- January 2009 to August 2020
- Baseline: 23%[18], Re-staging: 58% [46]; Interim: 5% [4], EOT: 5% [4], Survaillence: 3% [2], Suspicion of Multiple Myeloma 6% [5]
- Electronic Hospital Information System (HIS)

Results:

- Males=30, Females=15 [total n=45]. Age range: 23-75years (mean=54).
- Total 79 scans were acquired.
- Avid skeletal lesions 68%[54], SUV range 2.5-23.5 (mean 6.3); Non-avid lytic lesions 24.1%[19]; no lesion 7.6%[6]
- Visceral metastases n=16(20%), Nodal metastases n=23(29%)
- Of the staging scans, ^{18}F-FDG PET-CT was able to:
  - Confirm initial diagnosis in 14 (78%), Alter diagnosis based on lesions on PET-CT in 4 (22%), Identify additional skeletal lesions in 14 (78%), Change initial management plan in 8(44%).
- In 14/40 patients with Non-secretory MM and Solitary Plasmacytoma with/without BM involvement, ^{18}F-FDG PET-CT was able to:
  - Identify and confirm diagnosis in 93%, Identify additional bone lesions in 43%, Alter treatment plan in 50%
- In 20/40 patients with Secretory MM, ^{18}F-FDG PET-CT was able to:
  - Change in management in 70% by identifying additional bone lesions







CONCLUSION

^{18}F-FDG PET-CT has a promising role in identification, diagnosis and management of solitary plasmacytoma, non-secretory Multiple myeloma, and secretory Multiple myeloma.

REFERENCES

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3. Cavo M et al. Role of 18F-FDG PET/CT in the diagnosis and management of multiple myeloma and other plasma cell disorders: a consensus statement by the international myeloma working group. Lancet Oncol. 2017

Cases:

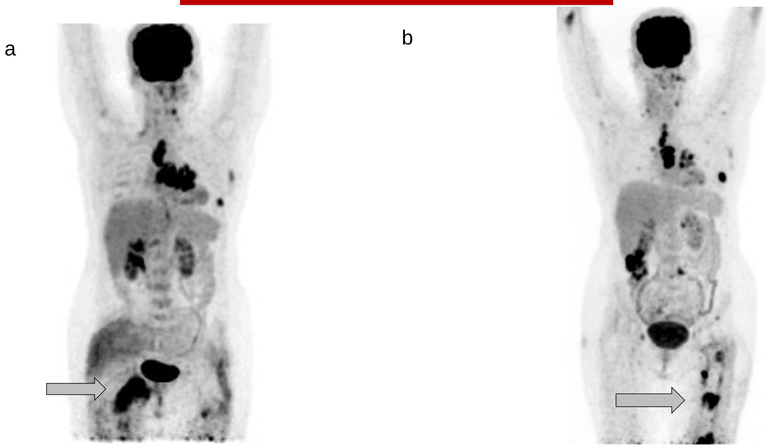

Figure 1: Re-staging scan of a 30 year old female with solitary Plasmacytoma. Maximum intensity projection PET only image (a) showing hypermetabolic primary tumour site in right proximal femur (arrow). Restaging scan of the same patient after radiotherapy MIP image (b) shows new site of FDG uptake in the left femur (arrow), that was later biopsy proven radiation induced osteosarcoma.

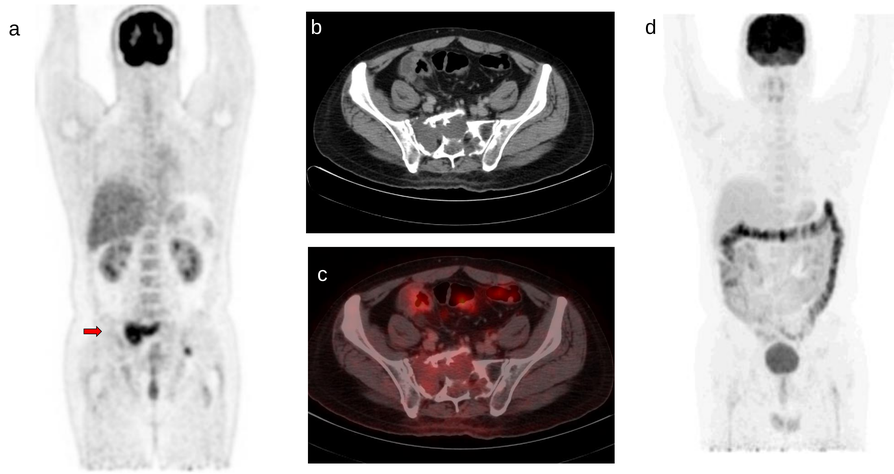

Figure 2: A 48 year old male with sacral plasmacytoma. MIP image(a) of the staging scan shows hyepermetabolic primary sacral tumour (red arrow) . Re-staging scan of the same patient: CT only image (b) shows morphological presence of the primary sacral tumour; Fused PET-CT image (c) and coronal MIP image (d) shows no metabolic activity, suggestive of Complete Metabolic Response.

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