ROLE OF ^{68}GA-PSMA-PET/CT IN THE MANAGEMENT OF BIOCHEMICAL RECURRENCE AFTER RADICAL PROSTATECTOMY: A RETROSPECTIVE ANALYS

Luca Frassinelli[1], Ercole Mazzeo[1], Bianca Lanfranchi[1], Laura Rubino[1], Giovanni Aluisio[1], Napoleone Prandini[2], Marco Vernaleone[1], Maura Scarlattei[3], Livia Ruffini[3], Frank Lohr[1] and Alessio Bruni[1]

[1]Radiotherapy Unit, University Hospital "Policlinico of Modena", Modena, Italy;
[2]Nuclear Medicin Unit, University Hospital "Policlinico of Modena", Modena, Italy;
[3]Nuclear Medicin Unit, University Hospital of Parma, Parma, Italy

AIMS: Recurrence after primary treatment of prostate cancer is one of the major challenges in uro-oncology. Biochemical recurrence occurs in up to one third of the patients (pts) undergoing radical prostatectomy (1). Over the last decade prostate-specific membrane antigen (PSMA) positron emission tomography (PET) have developed as better tools for staging than conventional imaging (2)(3). Our aim was to retrospectively evaluate how ^{68}Ga PSMA-11 PET/CT (GaPET) could change the management of pts affected by biochemical recurrence after radical prostatectomy for prostate cancer allowing dose escalation in local treatment or metastasis directed therapy such as stereotactic body radiotherapy in oligometastatic patients.

METHODS: Between April 2017 and August 2018 30 consecutive pts who had undergone radical prostatectomy were submitted to GaPET for biochemical relapse or persistence of PSA increase at first control after surgery. Pathological T stage was pT2a in 1pt, pT2b-c in10 pts and pT3 in 19 pts; positive margin status was found in 19 pts, while pelvic limphadenectomy was done in 21 pts, 3 of whom had positive node. Stratification for ISUP WHO 2014 group was as follows: 8 pts group 1, 3 group 2, 9 group 3, 6 group 4 and 4 group 5. Five of 30 pts (17%) had also undergone adjuvant radiotherapy on prostatic bed due to clinical stage, positive margin status or persistent PSA value after surgery. At the moment of restaging the median age was 68 years (range=43-83 years), the median PSA value was 0.77 ng/ml (range=0.09-12.92) and the median PSA doubling time was 0,47 years (range=0.05-2.76). Before being submitted to GaPET 9 patients were staged by conventional imaging (Abdominal CT Scan and/or Bone scintigraphy), 6 patients had also a pelvic MRI and 8 patients a Choline PET-CTscan. For each pt we established the therapeutic approach we would have proposed before being submitted to GaPET. When referred to our Unit 6 pts were initially considered candidates for continuing on regular follow-up, 18 for undergoing pelvic radiotherapy, 4 for radiotherapy with concomitant androgen deprivation therapy (ADT) and 2 pts for receiving only ADT. We decided to analyze changes in treatment assignment to these pts after having received the results of GaPET.

RESULTS: The results of GaPET showed one or more uptakes suspected for localization of PCa in 11/30pts (37%). In two pts a positive uptake was found in the prostatic bed, in 5 in pelvic nodes, while 2 pts had bone uptakes and finally two patients had 2 simultaneous uptakes, both in pelvic-nodes and bone. Analyzing PSA level pre GaPET we found that 2 of 10 pts with PSA value less than 0.5 ng/ml had pathological uptake (one node and one bone) with a crude detection rate of 20 %. Conversely 9 of 20 pts with PSA value equal to or more than 0.5 ng/ml had bone and/or nodal uptake with a crude detection rate of 45%. For 10 pts (36.7%) who underwent GaPET restaging, the initially suggested therapeutic approach was changed. Three pts moved from no treatment to Radiotherapy. Seven pts, previously candidates for pelvic RT, where then submitted to receive a boost on positive nodes, while one other was submitted to exclusive Stereotactic Body radiotherapy; finally, 4 patients switched directly to palliative ADT. Comparing previous restaging ^{18}F-Choline PET/CT and GaPET, 4 of 7 pts with negative Choline staging had pathological uptake with GaPET.

CONCLUSIONS: Restaging with GaPET seems to have a significant impact on management and decision-making for pts with Biochemical recurrence from Prostate cancer after primary local treatment. PSMA PET seems to provide better systemic staging of disease even for lower PSA levels causing changes in the therapeutic