Special Session (Sat, 24 Sep, 14:15−15:15)
PET-Based Treatment Decisions in Hodgkin Lymphoma

55 INVITED

FDG-PET in Hodgkin Lymphoma

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Combined computed tomography and positron emission tomography with 18F-fluorodeoxyglucose (FDG-PET/CT) has become a cornerstone imaging method in the management of malignant lymphoma, particularly in the management of Hodgkin lymphoma. FDG-PET/CT provides an improved staging accuracy, with higher sensitivity than conventional imaging methods including CT. The FDG uptake in Hodgkin lymphoma masses decreases rapidly after initiation of therapy in well responding patients, and this makes early interim FDG-PET/CT the strongest available predictor of treatment response and prognosis. A negative post-treatment FDG-PET/CT is highly predictive of long-term disease-free survival, and this has led to the incorporation of FDG-PET/CT into the revised response criteria for malignant lymphoma. This presentation will critically address the value of FDG-PET in Hodgkin lymphoma, including shortcomings of the available scientific evidence and common problems and pitfalls when FDG-PET/CT is used in the daily clinic and in clinical trials. The potential value of FDG-PET/CT in the follow-up setting, and in the management of relapsed Hodgkin lymphoma will be discussed.

56 INVITED

PET-Guided Radiation Treatment Planning in Hodgkin Lymphoma

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Background: The involved node radiotherapy (INRT) concept is used in the current EORTC-GELA-FIL H10 trial. Correct implementation of this new concept requires the use of a pre-chemotherapy PET/CT performed on patients in the treatment position.
Patients and Methods: Patients entered in the H10 trial in France and requiring additional post-chemotherapy radiotherapy. PET/CT data was prospectively obtained in most cases, before implementation of the radiation therapy using a secured DICOM–RT internet network. Involved lymph nodes were first delineated on the CT scan. The findings were then verified by coregistering PET. Additional lymph nodes detected on PET were included in the radiation volumes only if there was a regression or complete disappearance of the additional lymph nodes on the coregistered post-chemotherapy CT simulation.
Results: CT/PET data were obtained in 224 patients. Data were collected for the first 141 patients. Lymph nodes (LN) were considered to be involved if they were PET avid, equal to or larger than 5 mm and had completely disappeared on the post-chemo CT. When no disease was detected in various nodal areas, PET identified at least one additional LN in approximately 10% of the patients in each nodal area. When disease was already visible on CT, PET identified at least one additional LN in approximately 22% of the patients in each nodal area. Overall, additional lymph nodes were identified by PET in 70% of the patients (95% CI:62%-78%). In 40% of the patients, at least one additional involved supra-diaphragmatic lymph node area was detected by PET. Interestingly, patients who had a PET/CT performed in the treatment position and with IV contrast had a significantly lower number of additional involved lymph nodes detected by PET ($p < 0.002$) compared with those who had conventional CT/PET.
Conclusion: FDG-PET identified undetected involved lymph nodes in 70% of the patients. Implementation of the INRT concept requires a FDG-PET in the treatment position and with IV contrast, whenever possible.
Acknowledgments: Grant from Association pour la Recherche contre le Cancer (ARC #3154) and to the French colleagues who participated in the prospective quality control of the H10 trial. Authors are grateful to Lorna Saint Ange for editing.

57 INVITED

PET-Response Adapted Therapy in Hodgkin Lymphoma

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A high negative-predictive value of 18F-fluorodeoxyglucose (FDG) PET in early and late response assessment of Hodgkin's lymphoma patients has been observed in numerous trials. The consequent substantial reduction in the number of chemotherapy cycles and radiotherapy in many current trials seems to be very promising. The aim is to maintain high cure rates while lowering toxicity and potentially the rate of long-term complications, including secondary malignancies. The criteria used to describe FDG accumulation are widely standardized, but PET interpretation in a dedicated clinical algorithm is being discussed among study groups and will be evaluated in the ongoing trials.

Special Session (Sat, 24 Sep, 14:15−15:15)
Immunotherapy − The Future

58 INVITED

Immunochemotherapy

Abstract not received

59 INVITED

DNA Vaccination: Where do we Stand?

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Therapeutic DNA vaccination is a novel treatment modality for human cancer that is still under development. Despite the fact that DNA vaccination works well in preclinical models, this has not been translated to the human situation. Up to date no single DNA vaccine has been registered for the treatment of cancer.
DNA vaccines are in general minimal plasmids that have been genetically modified to contain a gene of interest under an active promoter (f.i. the CMV early promoter). These genes can encode tumour antigens, cytokines, chemokines etc. and are usually optimized for expression in human cells. DNA vaccines are most commonly applied intradermally or intramuscularly. Upon administration the plasmids are taken up by keratinocytes or myocytes respectively, perhaps even locally present dendritic cells and are being transiently expressed. Upon intramuscular DNA vaccination, transgene expression can be long-lived, sometimes weeks, whereas upon intradermal administration the expression will disappear in the course of several days. This is likely the result of the fate of the host cell, being a stable non-dividing myocyte or a short-lived keratinocyte. The major pathway through which immune responses are evoked upon DNA vaccination is cross-presentation. This means that upon destruction of the transfected cell or upon secretion of the translated protein, dendritic cells take up these antigens and cross-present these to T cells in the vaccine-site draining lymph nodes. The other pathway is direct presentation when DC themselves are transfected upon DNA vaccination. The exact mechanism by which plasmid DNA is taken up by cells is still unknown.
Nowadays a lot of effort is put into the design of vaccines that can be targeted to certain cell types by coupling to or incorporating the DNA in polyplexes, lipoplexes or liposomes.
The use of DNA as a platform for vaccination has several advantages and disadvantages: DNA vaccines are relatively easy to produce, are highly stable, cheap and safe. Although the plasmid DNA upon vaccination remains episomal, a small part of the DNA may incorporate into the genome of the host cell. The chance of integration however is at least 3 log lower than the spontaneous mutation frequency of the genome, making this potential risk of DNA vaccination negligible.
The most important disadvantage of DNA vaccination is its poor immunogenicity and many research groups over the world are trying to solve this problem. Some of the strategies used are making genetic fusions with stable carrier proteins and helper cassettes to provide CD4+ T cell help, by combining DNA vaccination with adjuvants or by increasing the DNA uptake and delivery of danger signals by using electroporation, coupling DNA to gold particles for gene gun delivery or skin damage upon application (DNA tattoo vaccination, or high pressure air streams (PowderJect).
DNA vaccination is a versatile strategy for immunotherapy of cancer. However, its optimal settings and use still need to be defined.