CONTINUING EDUCATION PROGRAM: EDITORIAL

Lymphoma and myeloma: Multiple imaging modalities at the heart of care

In order for the haematologist to manage patients with lymphoma and myeloma, consultation is needed with the radiologist, specialist in nuclear medicine, pathologist, and radiotherapist: multimodality imaging combining both morphologic and metabolic information is starting to become an integral part of diagnosis and treatment decisions, especially during multidisciplinary meetings, irrespective of disease stage. The purpose of this FMC brochure is to focus on the role of imaging technicians in haematological malignancies, from the initial diagnosis through to assessing response to treatment.

Lymphoma

This diagnosis is made based on anatomical pathology investigations (it is essential to have an optimum quality biopsy specimen available from the point when initial diagnosis is made, whether it is obtained surgically or under CT guidance) using frozen specimens of sufficient size that can be categorised, and this is considered together with an assessment of disease spread and the classification score taking in clinical information and laboratory studies. Over the last few years, the emergence of the metabolic imaging technique, FDG-PET scanning has changed the way in which the haematologist can manage lymphoma; CT scanning of the chest, abdomen, and pelvis nonetheless remains indispensable, and is routinely carried out as part of the initial assessment and at the end of treatment. According to international recommendations, PET is indicated for an assessment of disease spread in lymphomas that show strong FDG uptake, such as diffuse large B-cell lymphoma (DLBCL) and Hodgkin’s lymphoma, and it has greater sensitivity and specificity than CT. The evaluation of the patient’s response to treatment is based on morphologic criteria established by Cheson in 1999, although the IWC 2007 criteria may replace these when both morphologic and metabolic response are combined. The finding of residual masses on computed tomography after chemotherapy and/or radiotherapy, together with a negative PET scan result, indicates that there is no residual disease. A positive PET finding of a residual mass can be characterised if necessary using a CT-guided biopsy taken from the zone showing the greatest uptake. While the nodal form is the most common type of lymphoma, it is important to know when to consider a diagnosis of extranodal lymphomatous disease, which can affect any organ, and can call into question diagnoses of primary or secondary tumours; the radiologist must provide the evidence by taking biopsy specimens, and an inappropriate surgical intervention may thus be avoided. During consultation with the haematologist, the imaging technician must bear in mind what is really at issue with treatment: aggressive lymphomas are generally highly sensitive to chemotherapy with fewer relapses later on, while indolent lymphomas, which are also often sensitive to chemotherapy, tend to relapse. Interim PET assessments have now been proven to have prognostic value in LDBCL and Hodgkin’s lymphoma, but their impact on early changes in treatment remains to be defined in clinical trials: standardisation between functional and metabolic imaging would seem to be essential for these treatment approaches to be validated.

Myeloma

This is a haematological malignancy that is caused by the proliferation of malignant plasma cells within the bone marrow that secrete monoclonal immunoglobulin presenting in the blood and/or urine, and it is often discovered due to lytic bone lesions that can be detected on plain radiography (“punched-out” lesions, compression fractures, etc.). CT scanning is better than standard radiography because it can detect small osseolytic lesions, guide biopsies in order to obtain histological evidence, and assess the risk of fracture or instability, but like conventional radiography it remains limited in terms of demonstrating response to treatment.

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MRI is more sensitive than conventional imaging, especially when assessing the axial skeleton, enabling a distinction to be made between normal and invaded bone marrow: it visualises extramedullary masses very clearly and is an indispensable modality when there is a suspicion of spinal cord compression or nerve compression. But assessing the patient’s response to treatment remains difficult given that lesions can exist for a long time in a patient who has made an excellent response to treatment. Once again, as several clinical trials have shown, metabolic imaging is gradually taking the lead with its greater sensitivity than MRI, whether it is used at the time of the initial diagnosis or for the assessment of treatment response. It has been demonstrated that a negative result on PET-FDG allows for a prediction to be made of greater event-free survival and longer overall survival. A French programme to support expensive innovative techniques (STIC) is underway to prospectively and comparatively assess MRI and PET used in an intensive treatment programme. In myeloma, the debate has therefore begun into defining the respective roles of conventional imaging and PET scanning. In the same way as for lymphoma, we hope that in the future these two imaging techniques will be complementary, carried out together in real time with the advent of hybrid MRI/PET systems, leading to greater medical and economic efficiency.

Infectious chest complications in haematological malignancies

Around 50% of patients with a haematological malignancy will present a pulmonary infection during their management, with high morbidity requiring broad-spectrum anti-infective treatments. Multidisciplinary consultation is once again essential and authors agree unanimously on the crucial role of the CT scan both for the initial diagnosis and the monitoring of these patients: a CT scan carried out in good time is often the key to diagnosis and decision-making as it can indicate suitability for a CT-guided endoscopy carried out by a pulmonologist or biopsy carried out by a radiologist. Although a formal diagnosis of aetiology remains impossible based only on the assessment of a chest CT scan, findings can sometimes be highly suggestive of a diagnosis of aspergillosis, pneumocystosis, or *Haemophilus influenzae* bronchiolitis. CT therefore allows possible diagnoses to be put forward and prioritised to then be correlated with clinical information and laboratory study results: this is the key role of the radiologist in multidisciplinary discussions with haematologists or pulmonologists.

The authors of the different chapters of this FMC brochure have attempted to define the issues at stake in terms of diagnosis and treatment as they must be understood by an imaging technician during the often-difficult multidisciplinary decision-making process in haematological malignancies. It is also an opportunity to emphasise the complementary nature of radiology and nuclear medicine in this field and the need to increase cooperation in oncologic imaging. This is the real challenge of the development of imaging. We offer them our thanks and hope that you will not hesitate to consult this brochure as necessary.

Disclosure of interest

The authors have not supplied their declaration of conflict of interest.

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