The gross picture: intraindividual tumour heterogeneity in a patient with nonsecretory multiple myeloma

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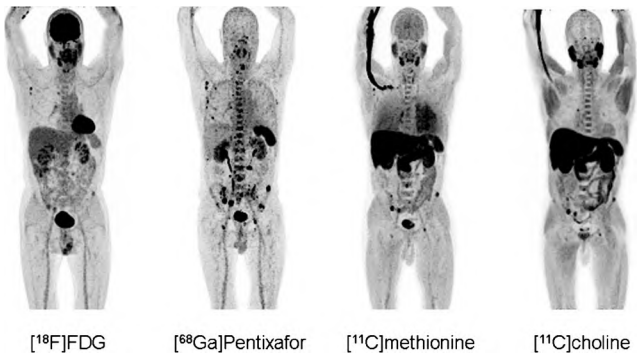
A 50-year-old man with a history of IgG λ multiple myeloma was referred for restaging after diagnosis of nonsecretory relapse following autotransplantation. In order to comprehensively assess disease activity as a serological marker was lacking, a complete metabolic imaging work-up including [^{18}F]FDG, [^{11}C]methionine and [^{11}C]choline PET/CT scans as well as CXCR4 directed imaging with [^{68}Ga]Pentixafor for potential endoradiotherapy were performed over a period of 1 week. Imaging with [^{68}Ga]Pentixafor revealed multiple intramedullary myeloma manifestations throughout the skeleton, whereas all the other tracers detected a significantly lower number of lesions.

Whereas tumour heterogeneity of multiple myeloma is well established and a number of studies have shown potential advantages of non-FDG tracers such as [^{11}C]methionine, [^{11}C]choline and [^{68}Ga]Pentixafor [1–5], this is the first report of a whole dataset in a single patient that offers the potential to compare the performance of various tracers in the same patient. In nonsecretory disease, follow-up and therapy monitoring depends on bone marrow biopsies and imaging, since serum and urine parameters cannot be used. With the marked differences in sensitivity



reported here, CXCR4 expression seemed to be the most suitable marker of disease in this patient. This observation was unexpected given the so far convincing results of [^{11}C]methionine in myeloma staging [3] as well as the more complementary role of CXCR4-directed imaging [5]. Comprehensive studies including biopsy of target lesions with different levels of tracer uptake are currently ongoing to improve our understanding of the underlying mechanisms involved in imaging heterogeneity in myeloma.

Compliance with ethical standards

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