Abstract:

Background: In the case of extravasation of radioactive drugs used in peptide-receptor radionuclide therapy of neuroendocrine tumors, or in radionuclide therapy in general, rapid action is important to reduce or avoid complications. The literature on extravasation of drugs for radionuclide therapy is sparse. Based on the present case, we discuss handling and consequences of extravasation. Further, we demonstrate that dosimetry can aid in judging if the treatment of neuroendocrine tumors is satisfactory even after extravasation.

Case presentation: A case of extravasation of [177Lu]Lu-DOTATOC with a treatment strategy involving exercise and elevation of the affected arm and application of a compression bandage and heating is reported. Redistribution of the drug is verified and quantified by whole-body imaging and quantitative SPECT/CT and measurements of the dose rate at contact with the injection site. [177Lu]Lu-DOTATOC was redistributed to tumors and organs within 1 day. The patient did not report any discomfort during or after hospitalization, and no side effects related to extravasation were observed. Quantitative SPECT/CT scans at the subsequent treatment cycle of the same patient were analyzed for a comparison between the treatments. Dosimetry showed the treatments were similar with respect to the kidney and tumor absorbed doses. The radiation dose to the epidermal basal layer near the injection site was estimated and found to be consistent with the lack of side effects.

Conclusions: The treatment of extravasation was successful, and the redistribution of the drug can be easily verified through measurement of the dose rate at contact with the skin. From the results of dosimetry, it was assessed that no change of the treatment course was necessary to compensate for a possibly incomplete treatment as a result of the extravasation.

Reference:

Arveschoug, A. K., Bekker, A. C., Iversen, P., Bluhme, H., Villadsen, G. E. and Staanum, P. F. (2020) Extravasation of [177Lu]Lu-DOTATOC: case report and discussion. EJNMMI Research. 10(1), p.68. https://doi.org/10.1186/s13550-020-00658-6.