Clinical vignette

Nuclear Medicine Review 2022, 25, 2: 136–137
DOI: 10.5603/NMR.a2022.0030

ISSN 1506–9680, e-ISSN 1644–4345

VIA MEDICA

Amino acid extravasation: a rare red flag to keep in mind during peptide receptor radioligand therapy (PRRT) with [^{177}Lu]Lu-DOTATATE

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[Received 11 I 2022; Accepted 27 IV 2022]

Abstract

A 64 years-old woman with intestinal neuroendocrine tumor (NET) and multiple liver metastases was referred for peptide receptor radioligand therapy (PRRT) with [^{177}Lu]Lu-DOTATATE. A few days after the third cycle of PRRT, erythema and swelling in the injection site is occurred which progressed up to one-month post-therapy. The cutaneous lesion was managed by a plastic surgeon with topical treatment. Amino acid extravasation could have devastating effects and should always be considered in patients who underwent PRRT and who receive amino acids for nephroprotection.

KEY words: NET; PRRT; cutaneous; extravasation; [^{177}Lu]Lu-DOTATATE

Nucl Med Rev 2022; 25, 2: 136–137

A 64 years-old woman with intestinal neuroendocrine tumor (NET) and multiple progressive liver metastases underwent 3 cycles of peptide receptor radioligand therapy (PRRT) with [^{177}Lu]Lu-DOTATATE. She had only received long-acting somatostatin analogs before. After two cycles of PRRT, the patient had a stable disease. In the third course of PRRT, 6.3 GBq [^{177}Lu]Lu-DOTATATE was injected thirty minutes after starting the infusion of the amino acid solution (25 g lysine and 25 arginine diluted with 2000 cc normal saline during 6 hours). Like previous treatment courses, a three-way valve catheter was inserted in the right antecubital fossa to administer amino acids and [^{177}Lu]Lu-DOTATATE via the same venous access. The patient did not report any discomfort or side effects; while blood pressure and pulse rate monitoring was performed throughout the treatment period. The -post-therapy whole-body scan was performed after 24 hours using the Siemens Symbia Intevo SPECT/CT dual-head gamma camera with a matrix size of 1024 × 256 and speed of 10 cm/min and showed a primary tumor in the small intestine with intense [^{177}Lu]Lu-DOTATATE uptake as well as several [^{177}Lu]Lu-DOTATATE avid metastases throughout the liver (Fig. 1).

Three days after the therapy the patient felt a burning sensation in the injection site with erythema and tenderness which deteriorates up to one month after PRRT at the time the patient informed us about this problem (Fig. 2). The post-therapy [^{177}Lu]Lu-DOTATATE whole-body scan was reviewed again and only a minimal focus of [^{177}Lu]Lu-DOTATATE extravasation was noted in the right antecubital fossa which could not be the cause of the large skin lesion.

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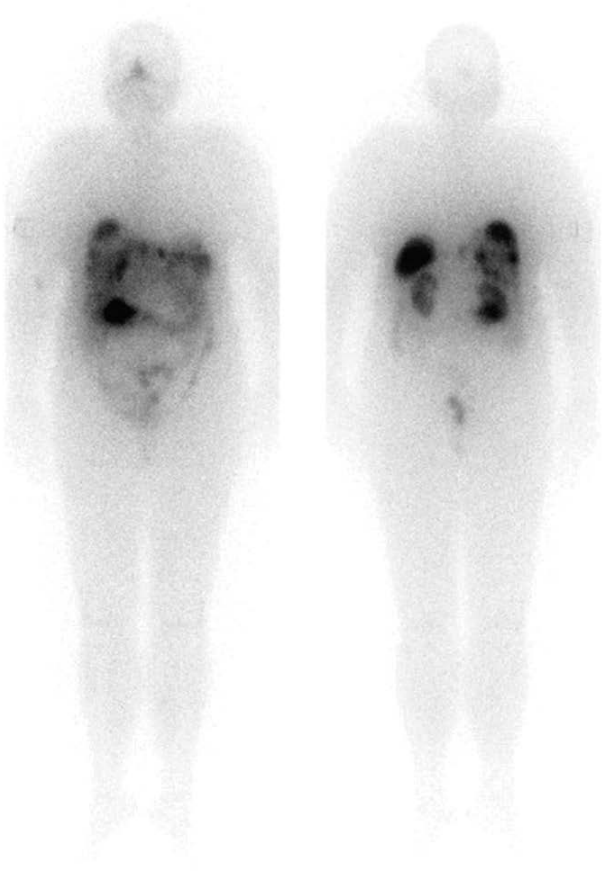

Figure 1. Post therapy whole body [^{177}Lu]Lu-DOTATATE scan performed 24 hours after therapy

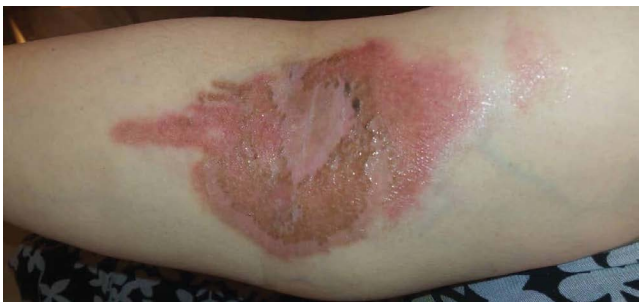

Figure 2. The lesion is an erythematous and erosive plaque with a sharp margin in the anterior cubital fold of the right hand with some degrees of secretion

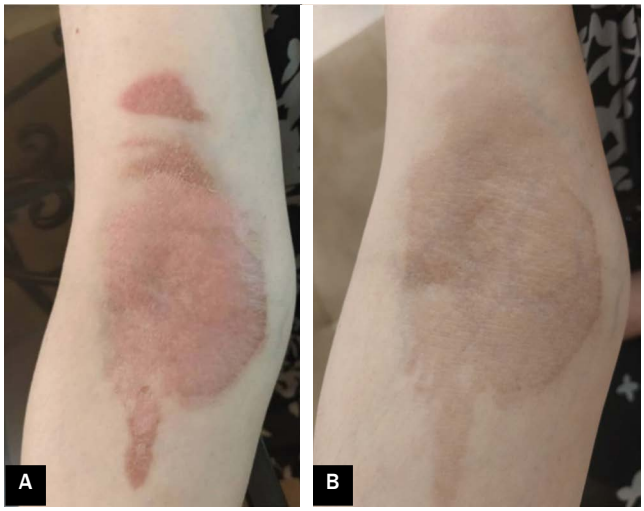

Figure 3. The left picture (**A**) shows the lesion 2 months after PRRT and the right picture (**B**) is 4 months after PRRT which showed near-complete healing of the lesion

The patient was referred to a plastic surgeon and topical therapies were administered and the skin lesion healed within four months (Fig. 3). We concluded that since there was no sign of [^{177}Lu]Lu-DOTATATE extravasation on post-therapy whole-body scan, this side effect is most likely due to the amino acid extravasation. Due to the high osmolarity of the Amino acid solution, its extravasation could cause serious cutaneous damages, even tissue necrosis which may need tissue debridement. This case shows the importance of monitoring the patient during the PRRT course and especially early physical examinations during the course of therapy and in the first week after to evaluate any adverse events that may occur to the patient.

Conflict of interest

The authors declare no conflict of interest.