

Radioactivity in drained body cavity fluid following peptide receptor radionuclide therapy with ¹⁷⁷Lu DOTATATE in patients with advanced neuroendocrine tumors

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BACKGROUND

- Peptide receptor radionuclide therapy with ¹⁷⁷Lu is commonly used among patients with progressive neuroendocrine tumors (NETs).
- Body cavity fluid collections, especially ascites, frequently occur in patients with advanced NETs and drainage is often required.
- Little is known about radioactivity in drained body cavity fluid collections following PRRT.

STUDY AIM

- **To evaluate the radioactivity of drained body cavity fluid collections in patients treated with PRRT within 2 days of drainage**

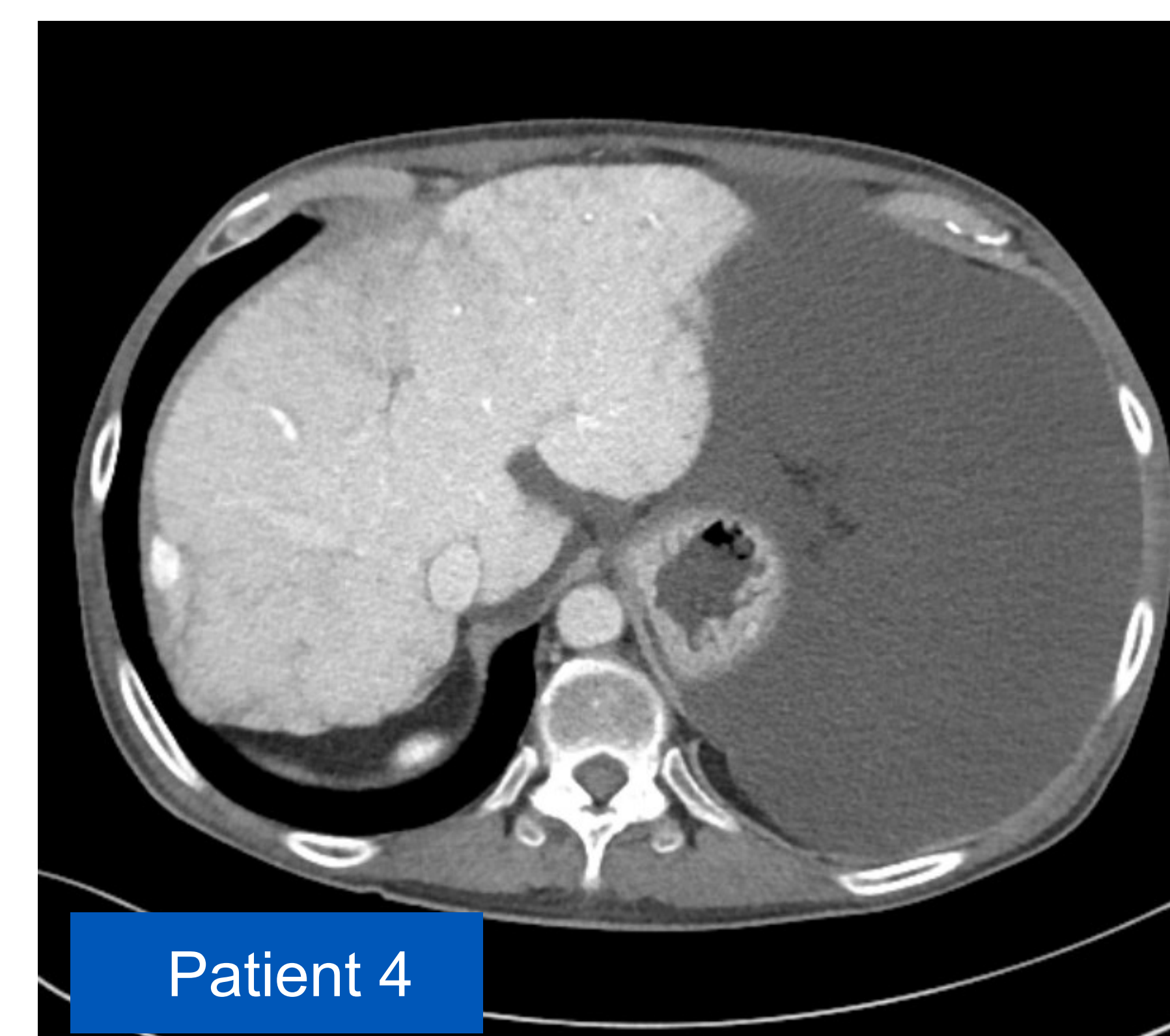
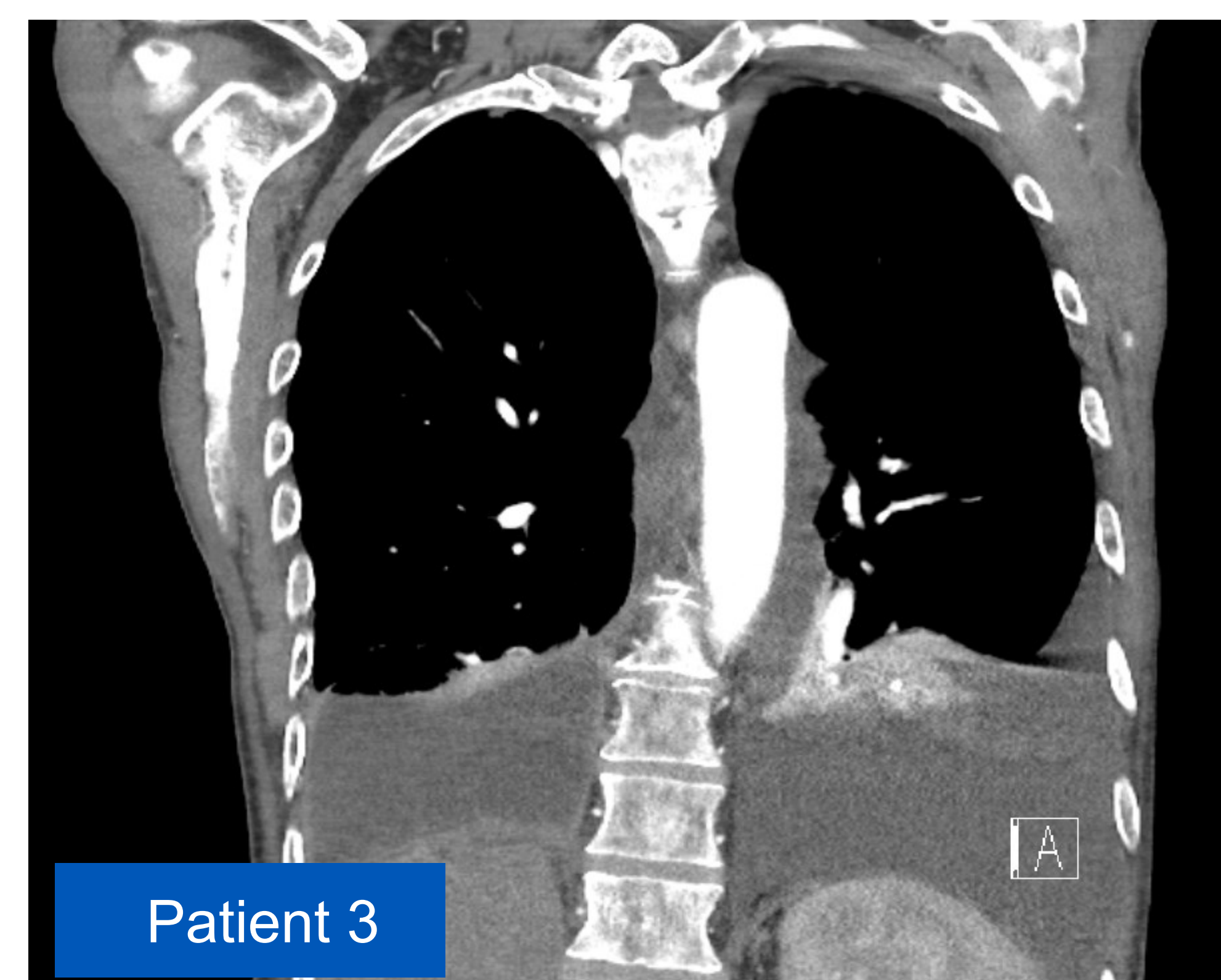
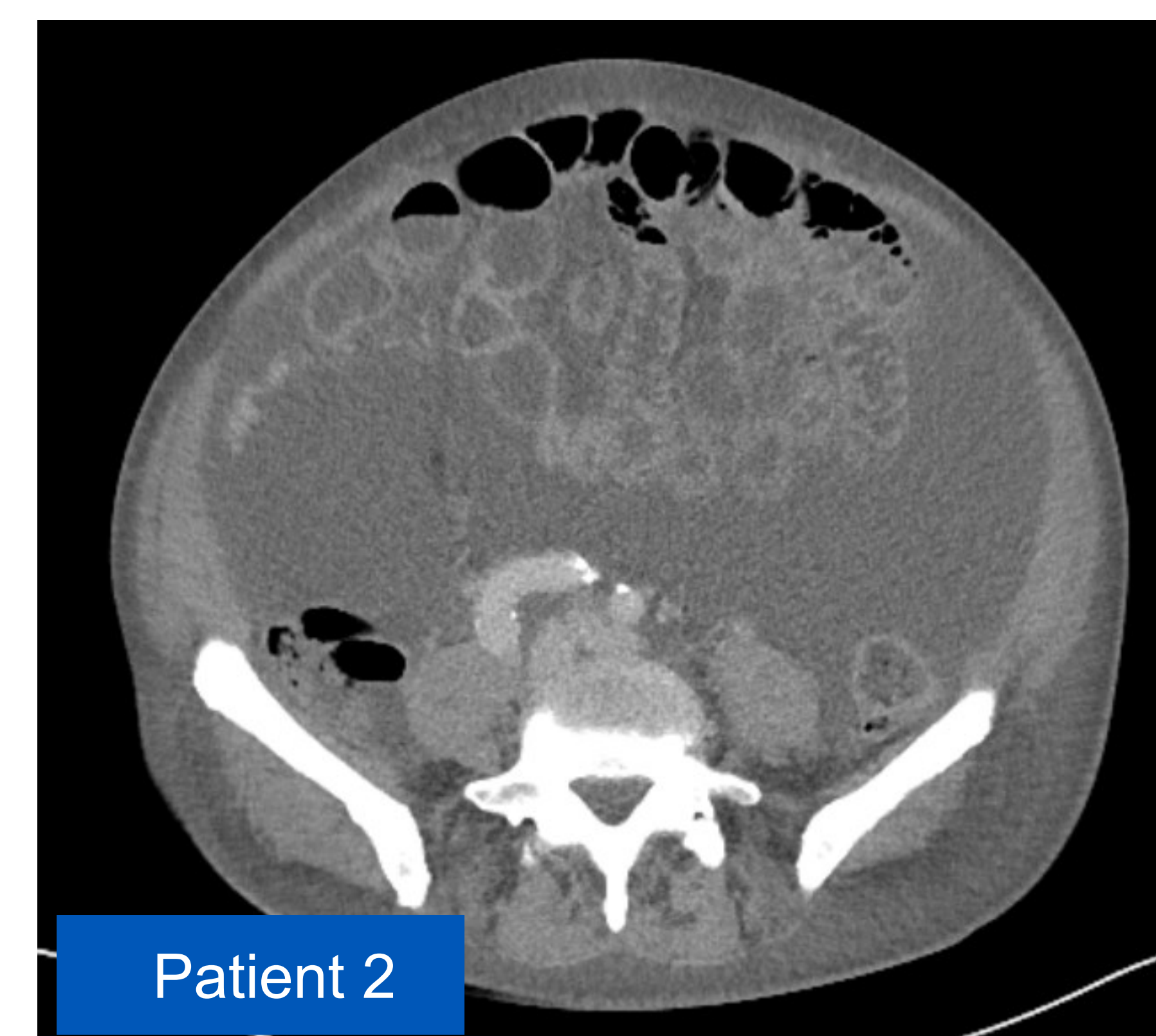
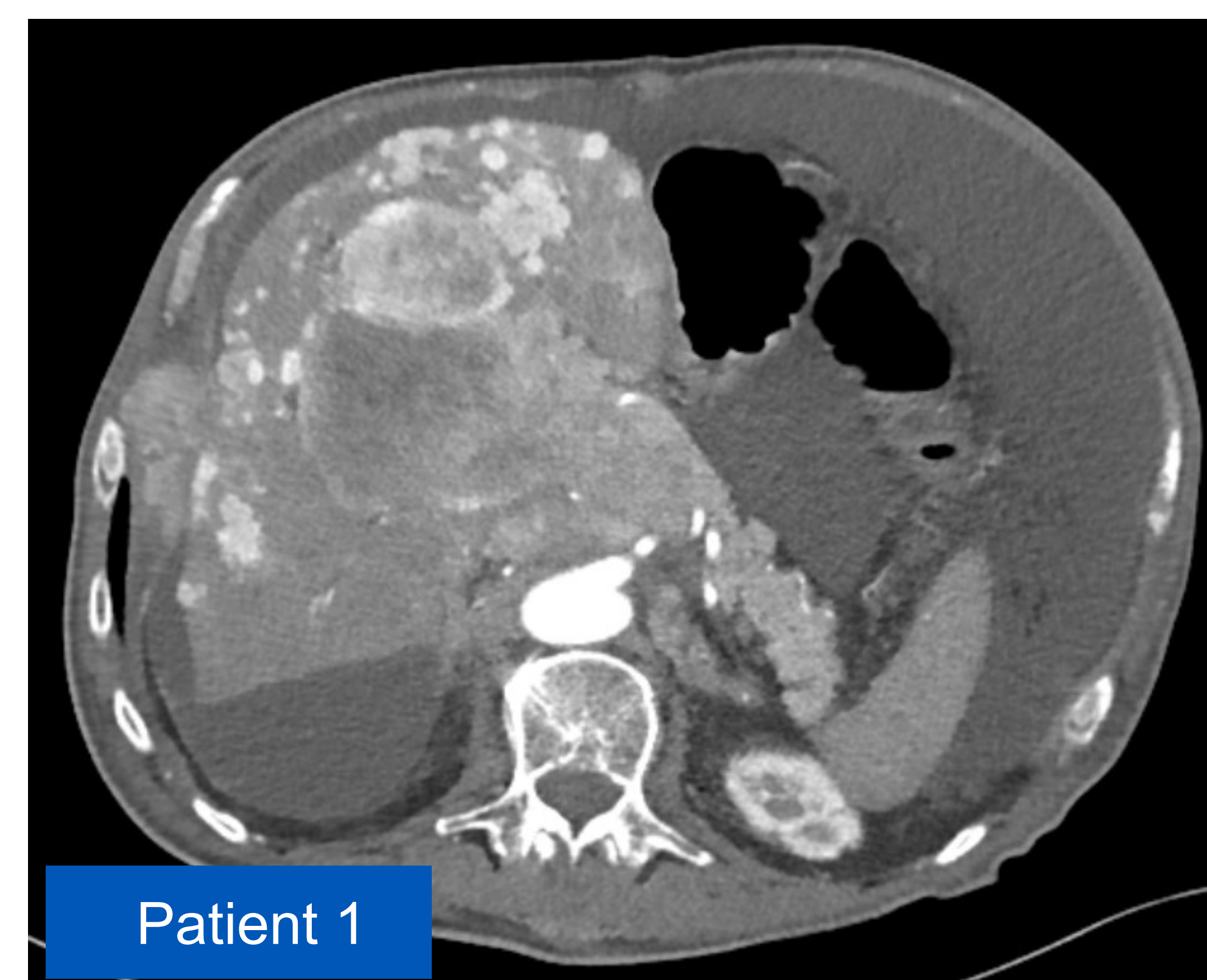
METHODS

- Patients with NETs undergoing therapeutic or diagnostic drainage procedures for symptomatic body cavity fluid collections in the days immediately following PRRT were identified using the institution's electronic medical record.
- The radioactivity in the drained body cavity fluid was measured using a Capintec dose calibrator

RESULTS

Patient No.	Fluid Type	Total Volume Drained (mL)	Volume Sampled/ Tested	Activity in sample (μCi)	Total calculated activity (μCi)
1	Ascites	4200	88	31.2	1489
2	Ascites	4500	50	5.5	495
3	Pleural fluid	500	40	11.2	140
3	Ascites	7400	58	74.6	9517

REPRESENTATIVE IMAGING STUDIES



RESULTS

- Samples from 4 patients were tested
- The median time from PRRT to fluid sampling was 1 day (range 1-3)
- All patients had extensively metastatic well differentiated NETs
- In one patients, the ascites was secondary to right-sided heart failure from severe carcinoid heart disease
- In another patient, the underlying cause of the ascites was portal hypertension
- Only one patient had malignant cells detected in the fluid on cytological examination
- Three of the 4 patients died within 6 weeks of having the fluid tested for radioactivity reflecting the fact that early on in the PRRT practice at our institution, patients were treated late in the course of their illness. One patient is alive 3.5 years later.

CONCLUSION

- The detected radioactivity in drained body cavity fluid following PRRT does not represent a significant exposure hazard
- Radiation protection practices should be followed when handling radioactive bodily fluids.
- When handling radioactive bodily fluids, standard precautions are sufficient to protect yourself from contamination