

Use of saline to avoid bowel injury in radiofrequency ablation

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Section: Interventional radiology

Case Type: Clinical Cases

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Patient: 39 years, male

Clinical History:

A patient being treated with radio-frequency ablation for a renal cell carcinoma was noted to have bowel adjacent to the lesion on pre-treatment images.

Imaging Findings:

A patient incidentally found to have a renal cell carcinoma was undergoing treatment with radio-frequency ablation (RFA). The patient's cardiac history and body habitus meant that a nephrectomy would be high-risk, and given the small size of the lesion, treatment with RFA was to be carried out initially.

The RFA electrode had been placed in the lesion, but on the pre-imaging scan, bowel was noted to be in close proximity to the lesion, increasing the risk of bowel damage. Saline, with dilute contrast, was instilled into the pararenal space to create a clear plane between the lesion and the bowel allowing safe treatment.

Discussion:

Radiofrequency ablation of renal cell carcinomas is a well recognised treatment for renal cell carcinoma. Although surgical excision remains the most commonly employed treatment RFA is a viable treatment alternative for small lesions, especially in patients with high surgical risk. Some authors even advocate carrying the procedure out as a day-case.

A number of complications have been reported in association with RFA. Pneumothorax, renal and bowel injury can occur during the insertion of the electrode, which is done either using ultrasound or CT guidance. Any structure adjacent to the electrode can sustain heat damage during the treatment. In this instance, the proximity of the bowel would have placed it at high risk for a thermal injury, which could lead to an immediate or delayed bowel perforation. This would be a disastrous consequence in a high-risk surgical patient. Using the electrode as a lever has been reported as a method of increasing the distance between the kidney and the bowel.

In this case saline and dilute contrast were instilled via a separate needle into the pararenal space. This created a plane between the kidney and the bowel. Small volumes of cool saline were injected at routine intervals during the procedure to avoid heating of the saline.

The patient had successful treatment of his renal cell carcinoma, and enjoyed an uneventful post-operative course.

Differential Diagnosis List: Successful RFA of a renal cell carcinoma

Final Diagnosis: Successful RFA of a renal cell carcinoma

References:

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Figure 1

a



Description: Initial CT image. Note proximity of the colon to the RFA ablation probe, placing it at high risk of thermal injury. **Origin:**

Figure 2

a



Description: CT image following instillation of saline/contrast mixture. Note this has dissected a plane between the bowel and kidney within the peri-renal fascia. **Origin:**