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LETTER /*Interventional imaging*

Percutaneous CT-guided cyanoacrylate glue plugging for fluid leakage after interventional oncologic procedure

Keywords Cyanoacrylate glue; Computed tomography (CT) guidance; Cerebrospinal leak; Urinary fistula; Interventional oncology

Dear Editor,

We describe herein two patients presenting with fluid leakage in whom conventional treatment failed and who underwent percutaneous cyanoacrylate glue plugging under computed tomography (CT) guidance resulting in a favorable outcome.

The first patient was a 49-year-old woman with history of lung adenocarcinoma and meningeal metastasis presenting with continuous cerebrospinal fluid (CSF) leakage to the skin and severe positional headache. CSF leakage was observed after removal of an intrathecal port initially placed for methotrexate chemotherapy for leptomeningeal metastases. Two autologous epidural blood patches were performed without improvement of the symptoms. Magnetic resonance (MR) imaging of the spine confirmed dural breach, which was located at the L3-L4 level (right-side) (Fig. 1). After multidisciplinary discussion and as a salvage option, it was decided to perform a percutaneous treatment of the breach. The second patient was a 79-year-old women presenting with urinary fistula after percutaneous cryoablation of renal cell carcinoma of the left kidney. At outpatient review meeting 1 month after discharge, she complained about mild discomfort in the region of the wound and fever. CT showed no evidence of disease recurrence but revealed a 10 cm urinoma (Fig. 2). After multidisciplinary discussion, percutaneous drainage of the perinephric collection was performed, which resulted in continuous daily urine drainage of 20—100 mL that persisted for the next month, despite JJ catheter placement. As the urinary fistula had not totally responded to conventional management and nephrostomy was not a tolerable long-term option for the patient, glue plugging was considered. In both patients, a 22-G needle was inserted under CT guidance. The tip was located in the space right to the leaks and 0.5 mL of iohexol (Omnipaque® 180, GE Healthcare) was injected to ensure the absence of any vascular reflux. Then a 1 mL of *n*-butyl2-cyanoacrylate (Glubran2®, GEM Srl) diluted 50/50 with ethiodized oil (Lipiodol®, Guerbet) was injected into the identified space to occlude the breach. The subsequent clinical and imaging follow-up confirmed the complete resolution of the leakages in both patients.

These reports illustrate the high versatility of cyanoacrylate glue in interventional oncologic procedures [1]. Leakage or fistula occurring after surgery or ablations may occur but are often challenging to treat [2,3]. These complications increase the risk for additional infectious complications as well as discomfort [4]. Drainage, blood patch or surgery are accepted management strategies for persistent leak [3]. However, these first-line options may fail or be considered as too invasive. To provide further assistance to the patients and referring physicians; some authors proposed the use of glue in various conditions such as CSF leak [5], or urinary, malignant esophagotracheal, entereocutaneous, aortocaval and pancreatic fistula [3]. Sealant properties of glues are not a new concept but potential concerns relating to the use in vivo of glue were rose [1]. They include response to foreign body, tissue damage from the exothermic reaction and glue spillage. We thought that a percutaneous approach performed under CT guidance may help improve the targeting and glue deposition and then may help avoid complications. The technique described herein under CT guidance might be a promising second-line treatment option in patients with leakage occurring after surgery or percutaneous ablation. Direct percutaneous puncture at the level of the breach is relatively straightforward thanks to CT monitoring. No general anesthesia is required as the procedure is well tolerated. However, a limitation of the technique may occur in case of venous reflux. This could lead to dangerous migration of the liquid agent, especially into the radicular veins in case of CSF leakage, which can compromise normal venous drainage of the medulla [5]. This risk justifies to carefully place the tip of the catheter under imaging guidance and inject only a small amount of glue only after contrast injection. Further larger evaluation is mandatory before drawing definitive treatment decision tree to guide physicians managing patients in this setting [6].

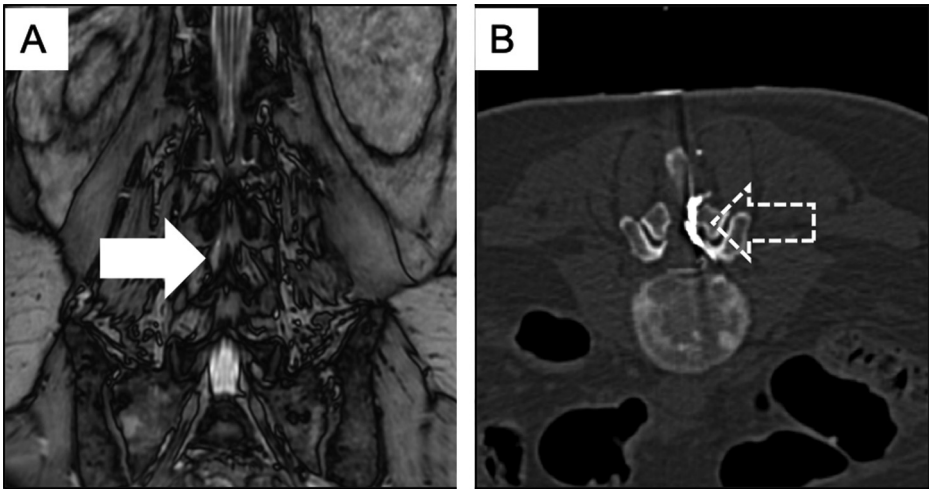

Figure 1. 49-year-old woman with history of lung adenocarcinoma and meningeal metastasis presenting with continuous cerebrospinal fluid leakage to the skin. A. T2-weighted MR image in the coronal plane demonstrates cerebrospinal fluid leakage (arrow). B. CT image in the axial plane shows cyanoacrylate glue plugging within the epidural space (dashed arrow).

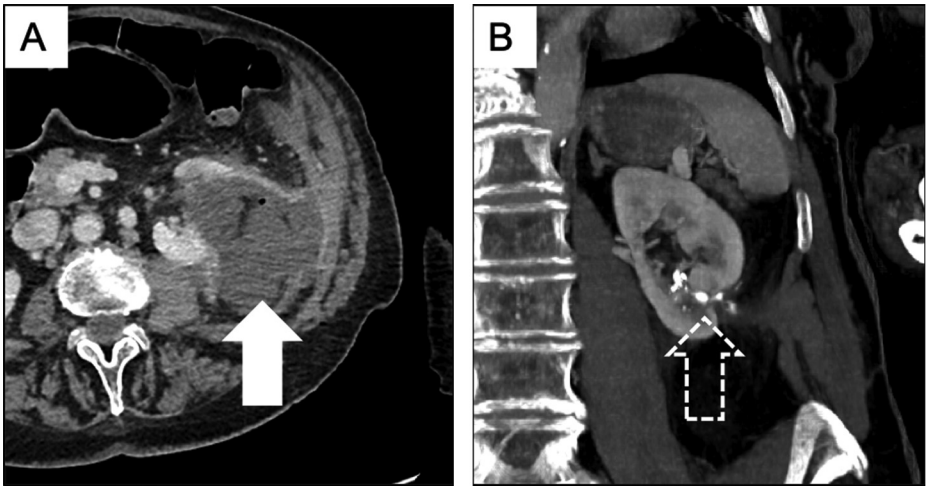

Figure 2. 79-year-old woman presenting with urinary fistula after percutaneous cryoablation of a renal cell carcinoma of the left kidney. A. CT image in the axial plane shows urinoma (arrow). B. Follow-up CT image in the coronal plane 10-months after glue plugging shows complete resolution of the fistula. Dashed arrow shows the cyanoacrylate glue plug.

Authors' contributions

S.T., M.N.N., M.B.A. and F.C. contributed to the design and implementation of the clinical research, to the analysis of the results and to the writing of the manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

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S. Tavolaro , M. Ben Ammar ,
M. Nouri-Neuville , F.H. Cornelis*
Department of Radiology, Tenon Hospital, Sorbonne Université, AP—HP, 4, rue de la Chine, 75020 Paris, France

* Corresponding author.
E-mail address: francois.cornelis@aphp.fr
(F.H. Cornelis)

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