

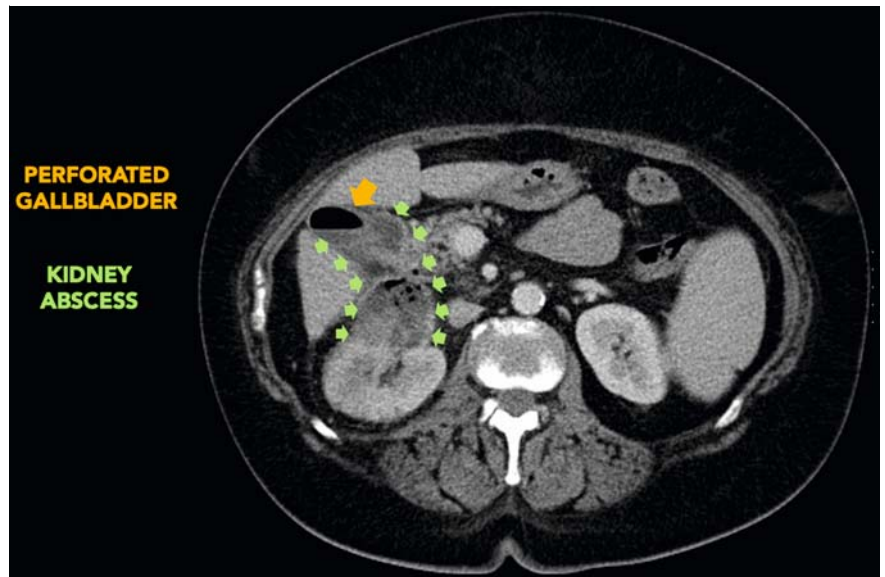
## Endoscopic ultrasound-guided drainage of a complex kidney abscess penetrating to the gallbladder and right liver lobe

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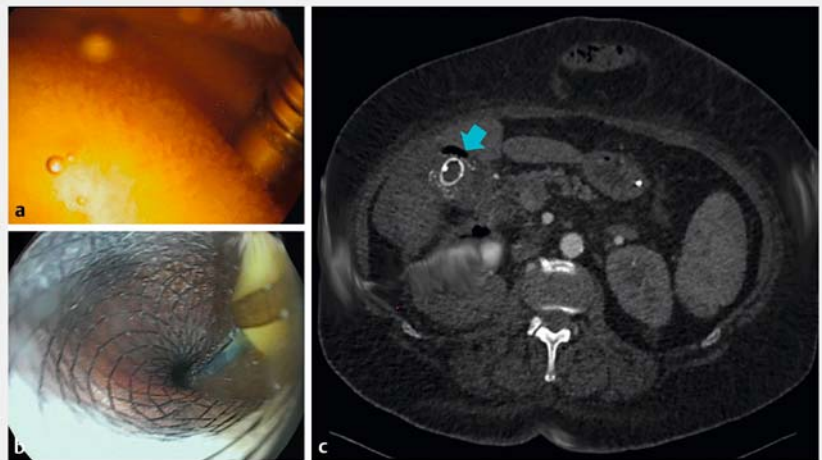
A 64-year-old woman with a past medical history of poorly controlled diabetes, morbid obesity, hypertension, and status post-oncological treatment for metastatic sigmoid colon cancer was admitted to the surgery department due to a 50×40×43-mm abscess in the right kidney on computed tomography (CT) (► Fig. 1). The abscess penetrated the gallbladder, causing its perforation. It also penetrated the liver and was causing renal artery infiltration with pseudo-aneurysm formation (21 mm and 16 mm in diameter) (► Fig. 2). The patient was clinically and biochemically septic. CT ruled out other sites of abscess. Due to significant associated co-morbidities, poor general status, and poor percutaneous access, neither a standard surgical intervention nor percutaneous drainage was feasible.

As there was a connection between the kidney abscess and perforated gallbladder, endoscopic ultrasound (EUS)-guided drainage was performed under general anesthesia using a linear echoendoscope (► Video 1). Through transduodenal access after endosonographic visualization of the gallbladder, fine-needle aspiration (FNA) with a 19G FNA needle was performed. The aspirated purulent content mixed with bile of the gallbladder confirmed the position. A 0.035-inch guidewire was advanced through the needle and looped in the abscess cavity under X-ray control. Then, the tract was dilated with a 10-Fr cystotome, followed by placement of a 20 × 16-mm cautery-enhanced lumen-apposing metal stent (LAMS). Immediately, purulent content outflow was observed from the stent lumen. The procedure was concluded with placement of a 7-Fr nasogastric tube through the LAMS lumen for active abscess lavage (50 ml of saline every 6 hours).

After 3 weeks of active transmural drainage, symptoms resolved and laboratory parameters normalized. CT showed a



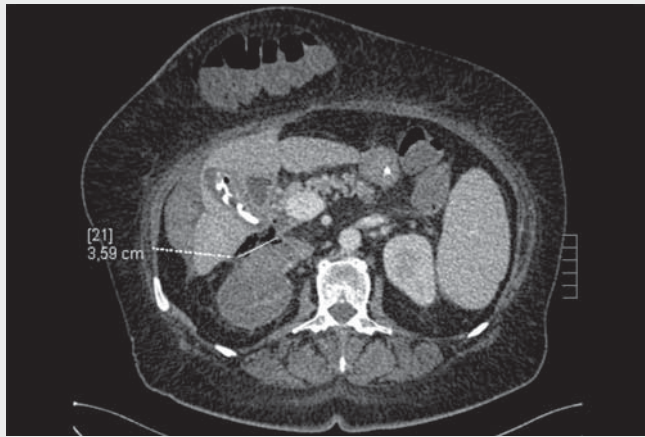
► Fig. 1 The 50×40×43-mm abscess in the right kidney, penetrating into the gallbladder causing its perforation.



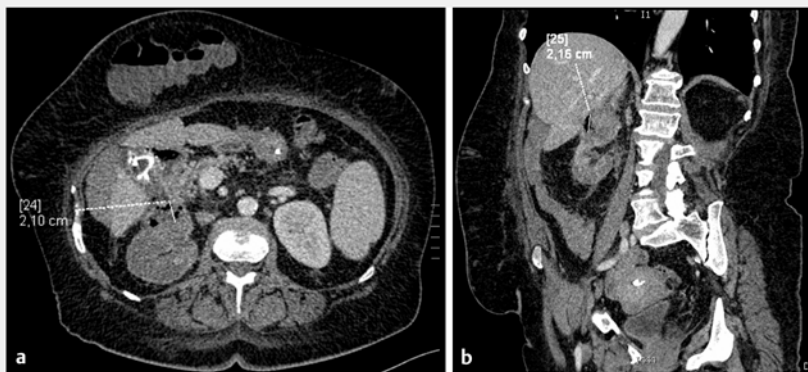
► Fig. 2 Endoscopic ultrasound-guided lumen-apposing metal stent (20 mm × 16 mm) placement for left kidney drainage through the gallbladder, followed by nasogastric tube placement.

collection decrease to 3 mm, given that the nasogastric tube was replaced with a 7-Fr × 7-cm double-pigtail stent. The patient was discharged and followed up in outpatient settings. After 5 months, CT

showed a collection size of 21 × 10 mm (decrease > 50 %) and a healed gallbladder wall during follow-up endoscopic assessment (► Fig. 3). One year after the procedure, the patient remains asymptomatic,



▶ **Video 1** Endoscopic ultrasound-guided drainage of a complex kidney abscess through perforated gallbladder using lumen-apposing metal stent with double pigtail.



▶ **Fig. 3** Computed tomography performed 5 months after the procedure: successful endoscopic treatment (collection size 21 × 10 mm; decrement > 50%).



▶ **Fig. 4** Surveillance esophagogastroduodenoscopy 12 months after the procedure: healed gallbladder wall; patient remains asymptomatic.

without collection, on LAMS stent and permanent double-pigtail drainage to prevent recurrence (▶ **Fig. 4**).

This case is important for three reasons. First, we show how a complex kidney abscess penetrating the gallbladder and liver can be successfully managed endoscopically. Second, EUS-guided drainage of a peritoneal cavity abscess might be an optimal alternative therapy for patients with multiple comorbidities, at high risk for life-threatening recurrent sepsis, and are poor surgical candidates. Lastly, similar to the management of other types of recurrent collections, long-term transmural drainage with an indwelling double-pigtail plastic stent seems to be an option for this group of patients [1].

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### Competing interests

The authors declare that they have no conflict of interest.

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