Novel less-invasive therapy for liver abscess: combining lavage and draining through a single device

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Background and Aims: The management of liver abscess is based on percutaneous drainage and antibiotics, whereas surgery is reserved for complex or refractory cases. Endoscopic therapy is restricted to abscesses with biliary duct communication. We describe a promising technique for managing liver abscesses after conventional treatment failure.

Methods: We present the first case report of a minimally invasive therapy for managing liver abscess in a high-risk patient after GI surgery. In this case, an ultraslim endoscope was inserted inside the collection to allow direct necrosectomy, followed by endoscopic vacuum therapy (EVT) using a double-lumen tube for lavage and drainage through a single device.

Results: A 55-year-old woman who underwent robot-assisted gastrectomy for gastric adenocarcinoma was readmitted on the seventh postoperative day with a liver abscess and extensive liver necrosis. Image-guided percutaneous drainage was performed without clinical improvement. Endoscopic management was chosen as rescue therapy. Extensive lavage with saline solution was performed, and a homemade modified EVT with an instillation device was placed. After 14 days, there was resolution of the collection, and the patient did not present recurrence within 6 months of follow-up.

Conclusions: This novel homemade EVT combining drainage and lavage is feasible and appears to be safe and effective for managing liver abscess, especially when conventional therapies fail. This approach allows bedside evaluation inside the collection and accurate control of responsiveness to treatment. Furthermore, it enables therapeutic procedures such as direct necrosectomy and insertion of an EVT tube. Further studies are necessary to confirm this hypothesis. (iGIE 2023;2:18-21.)

(footnotes appear on last page of article)

Liver abscesses are pus-filled collections from intra-abdominal infection, hepatic injury, or hematogenous spread from other locations. They are usually associated with cholangitis, peritonitis, or after abdominal surgery as an adverse event of iatrogenic lesion or ischemia.[1] Treatment is based on percutaneous drainage and use of antibiotics, whereas surgery is reserved for complex or refractory cases. The endoscopic approach is restricted to abscesses with biliary duct communication.[1-3] In this article we describe a promising minimally invasive technique for managing liver abscesses after conventional treatment failure.

METHODS

We present the first case report of a novel endoscopic therapy for managing liver abscess refractory to percutaneous treatment. In this case, an ultraslim endoscope was inserted inside the collection to allow direct necrosectomy, followed by endoscopic vacuum therapy (EVT) using a double-lumen tube for lavage and drainage through a single device. EVT promotes macro- and micro-deformation, increases angiogenesis, reduces exudates, and promotes bacterial clearance, which stimulates healing. Furthermore, combining vacuum therapy and saline solution irrigation promotes infection control and stimulates healing.[4,5]

As previously described by our group, the modified sponge was manufactured on the aspiration portion of the tube with gauze and incise drape.[6-12] The slippery surface of this homemade EVT is not associated with tissue ingrowth like the traditional polyurethane sponge (Fig. 1). The device was connected to a vacuum machine (V.A.C. Veraflo; KCI-3M, San Antonio, Tex, USA) set to perform negative pressure intercalated with cycles of saline solution instillation.

This system differs from other commercially available machines that either provide instillation under continuous flow (without a soak time) or use gravity to inject

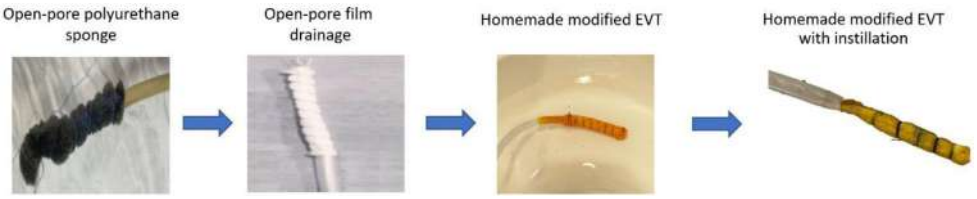

Figure 1. Evolution of the endoscopic vacuum therapy (EVT) device. A polyurethane sponge is the standard device. However, it presents disadvantages, such as challenging insertion and tissue ingrowth, which increases the risk of bleeding. To overcome these limitations, the use of an open-pore film was reported, but it presents higher costs and limited availability. Our group described the homemade modified EVT constructed using a nasogastric tube, gauze, and antimicrobial incise drape. The modified EVT with instillation is an adaption of this device, which uses a double-lumen tube to allow aspiration and irrigation through the same device.

Figure 2. CT showing an hepatic abscess.

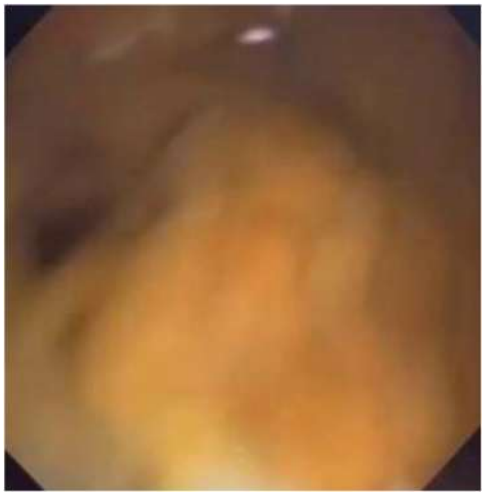

Figure 3. Percutaneous endoscopic evaluation demonstrating an hepatic abscess with necrosis and purulent content.

solution into the wound. This machine is ideal for removing thick exudate and purulent content. Moreover, this device allows customization of the negative pressure settings, duration of instillation cycles, and instillation volume.[4]

Figure 4. Guidewire placement into the hepatic abscess after endoscopic lavage.

RESULTS

We describe the case of a 55-year-old woman who underwent a robot-assisted gastrectomy for gastric adenocarcinoma. On the seventh postoperative day, she was readmitted with jaundice and hypotension. A CT revealed a hepatic abscess and extensive liver necrosis. Image-guided percutaneous drainage (12Fr stent) was performed without clinical improvement after 7 days (Fig. 2).

Because of active infection and no improvement in the patient's clinical condition, endoscopic management was chosen as rescue therapy. A transcutaneous endoscopic evaluation was performed using an ultraslim gastroscope (GIF-XP 160; Olympus America, Melville, NY, USA) with no need for tract dilation that demonstrated a hepatic abscess with fibrin, necrosis, and purulent content (Fig. 3). After direct necrosectomy and extensive lavage with saline solution, a hydrophilic guidewire was placed (Fig. 4) followed by insertion of the homemade EVT tube (15Fr) (Fig. 5). Because the homemade system was used, there was no need to dilate the tract before placement. Fluoroscopic

Figure 5. Placement of the homemade modified endoscopic vacuum therapy device with irrigation lumen.

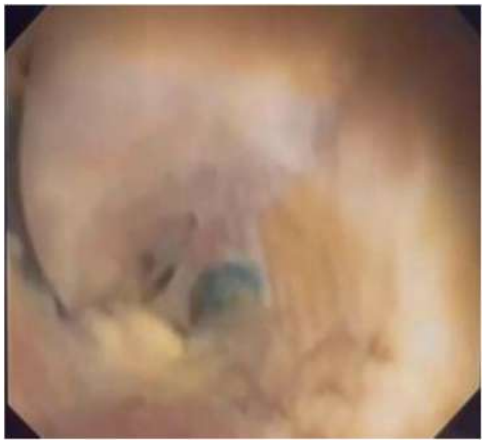

Figure 6. Endoscopic appearance after 2 weeks of endoscopic vacuum therapy.

guidance was not required because of the short tract shown during endoscopic evaluation. The vacuum machine was set to deliver a negative pressure of –125 mm Hg intercalated with cycles of saline solution instillation.

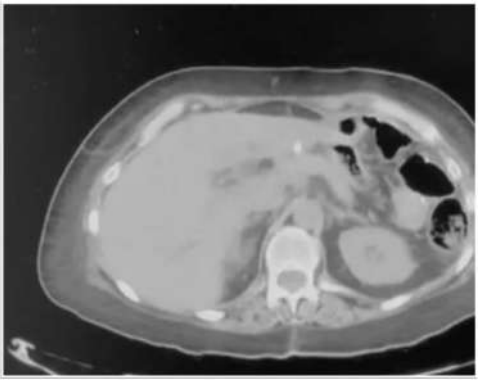

Figure 7. CT after completion of endoscopic vacuum therapy showing no signs of liver abscess.

After 14 days of EVT (2 system exchanges), the patient presented a significant clinical improvement (Fig. 6). The CT confirmed a complete resolution of the collection (Fig. 7). She was discharged 5 days later (Figs. 8 and 9) without antibiotic use and did not present recurrence during 6 months of follow-up.

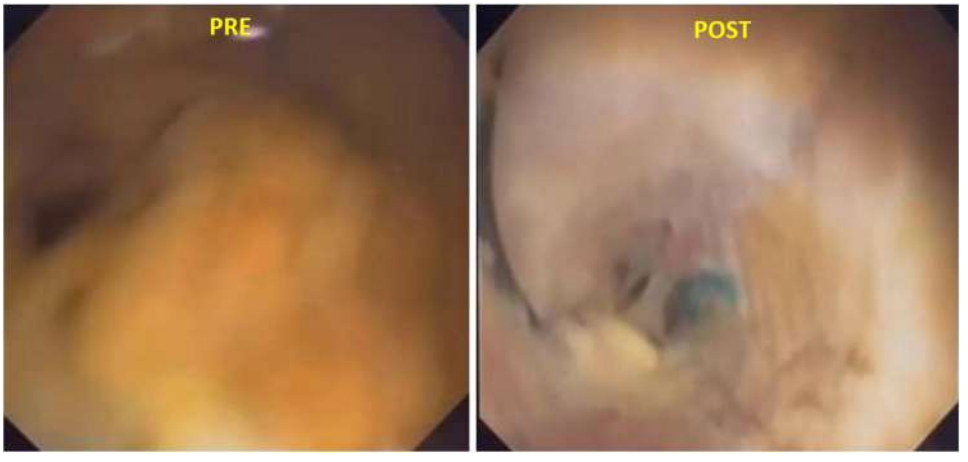

Figure 8. Endoscopic findings before and after treatment with the homemade modified endoscopic vacuum therapy with instillation device.

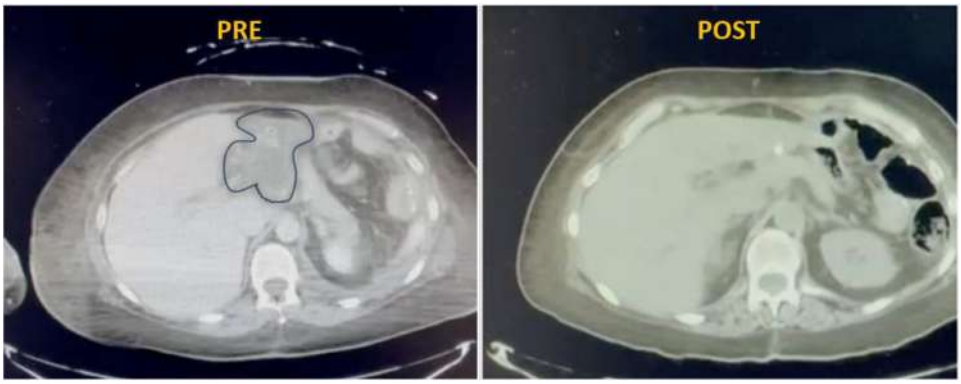

Figure 9. CT before and after treatment with the homemade modified endoscopic vacuum therapy with instillation device.

DISCUSSION

Percutaneous drainage and antibiotic therapy remain the criterion standard therapy for managing large liver abscesses. However, less-invasive approaches are needed when failure occurs. This novel homemade EVT combining drainage and lavage is feasible and appears to be safe and effective for managing liver abscess, especially when conventional therapies fail.[7-11] Additionally, unlike the EVT of upper GI defects, which may lead to patient discomfort because of EVT system tube placement through the nares,[12] discomfort is not an issue in this approach.

This approach allows bedside evaluation inside the collection and accurate control of responsiveness to treatment. Furthermore, it enables therapeutic procedures such as direct necrosectomy and insertion of an EVT tube. Although in this case the EVT system used a 15Fr tube compared with the 12Fr stent used by interventional radiology, we believe the successful healing was not related to the size of the device but to the mechanism of action related to the combination of aspiration and irrigation therapy. Further studies are necessary to confirm this hypothesis.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: EVT, endoscopic vacuum therapy.

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