

ROLE OF ENDOSCOPIC ULTRASOUND (EUS) IN THE DIAGNOSIS AND MANAGEMENT OF PANCREATIC PSEUDOCYSTS



Pancreatic pseudocysts are encapsulated, enzyme-rich fluid collections that appear as a complication after 4 weeks of an episode of acute pancreatitis or in the context of the evolution of chronic pancreatitis.

The Atlanta classification, revised in 2012, differentiates them from other walled-off necrotic (WON) collections, primarily based on their contents. Pure liquid collections with little debris are called pseudocysts, while WONs contain both solid and liquid material. This distinction is key to management.

In this scenario, endoscopic ultrasound (EUS) has become established as the most accurate tool for characterization, risk stratification, and minimally invasive treatment. It is important to emphasize that these are not acute fluid collections, as these lack a capsule and present before 4 weeks, nor are they WONs because they do not have necrosis (1-2).

ROLE OF EUS IN THE DIFFERENTIAL DIAGNOSIS OF PSEUDOCYSTS

EUS allows for a detailed evaluation of the wall, the internal contents of the cyst, and its relationship to vascular structures, surpassing CT and MRI.

Typical findings in pseudocysts include homogeneous anechoic or hypoechoic content, a well-defined wall, and absence of significant solid debris.

Furthermore, EUS is key to differentiating pseudocysts from WON, neoplastic cysts, or pseudoaneurysms, thus avoiding inappropriate interventions (2).



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CURRENT INDICATIONS FOR EUS-GUIDED DRAINAGE

Not all pseudocysts require drainage. Accepted indications include persistent pain, infection, bleeding, gastric or biliary obstruction, and progressive growth. Current guidelines recommend EUS-guided drainage as the first-line treatment when indicated, due to its greater safety and efficacy compared to conventional endoscopic or surgical drainage. Many physicians refer patients with pseudocysts to us for EUS-guided endoscopic drainage based on their size. However, size is not a parameter for indicating drainage if the patient, despite having a large pseudocyst, is asymptomatic (3).

EUS-GUIDED DRAINAGE TECHNIQUE

EUS-guided drainage allows for selection of the optimal puncture site, avoiding interposing vessels using Doppler ultrasound to prevent bleeding. It can be performed with double-pigtail plastic stents or luminal apposition metallic stents (LAMS).

In simple pseudocysts, both are effective; however, plastic stents are suitable and more cost-effective in draining pseudocysts, which by definition do not have necrosis (4-5).

The capsule should be measured; it must be at least 7 mm. At this point, it is important to zoom in to assess the distal capsule. The capsule's dimensions are crucial: they determine the drainage requirements, since smaller or weaker capsules can rupture the connection between the stomach or duodenum and the cyst, causing the contents to leak into the cavity, including CO₂ (always use CO₂ as the insufflation method). This can lead to pneumoperitoneum, pain, and decreased respiratory capacity.

The puncture should be performed by placing the transducer as close as possible to the cyst, ideally using a short, direct approach. A 19G FNA needle is used, and C-arm fluoroscopy is recommended.

Once the cyst is punctured, it is aspirated and a sample is taken for cytology and laboratory analysis (the tests requested for the different types of cysts will be analyzed in another bulletin).

In the case of a pure pseudocyst, we prefer the use of a pigtail-type plastic stent. After aspiration, a 0.035 hydrophilic guidewire is passed, visualized using fluoroscopy, ensuring that it makes several twists (coils) to guarantee sufficient length within the cyst, prevent its displacement, and allow the introduction of devices that facilitate drainage.

Subsequently, guided by fluoroscopy, access is gained with a 6 Fr cystotome, and the tract can be dilated with a small biliary balloon or a Soehendra dilator. Finally, the pigtail is placed. Depending on the size of the cyst, multiple stents can be placed (6).

CLINICAL OUTCOMES AND ADVERSE EVENTS

The technical and clinical success rates of EUS-guided drainage exceed 90%, with shorter hospital stays and lower morbidity compared to surgery.

Adverse events include bleeding, infection, stent migration, and buried stent syndrome, especially with LAMS not removed promptly. Therefore, endoscopic follow-up is mandatory (7).

MONITORING AND REMOVAL OF STENTS

When plastic stents are used, they should be removed between 4 and 8 weeks after placement, provided that cyst resolution is confirmed by imaging such as EUS, CT, or MRI. Table 1 is included, which serves as a guide for removal times according to the type of collection (8).

When the treating team decides to use LAMS, European guidelines recommend removing them between 3 and 6 weeks after resolution of the pseudocyst, confirmed by imaging. EUS can be used again to verify cavity collapse and rule out complications. In patients with chronic pancreatitis and ductal disruption, pancreatic duct management should be considered (9).

TABLE 1

Retiro de stents plásticos — pseudoquistes pancreáticos

Tiempo recomendado según contexto clínico

| Escenario | Tiempo de retiro | Control imagenológico | Momento |
|--|-----------------------|--|---|
| Seudoquiste sin comunicación ductal Ducto íntegro en CRMN | 4-6 semanas | TC · CRMN · USE | Tras resolución imagenológica |
| Seudoquiste con comunicación ductal Fístula al ducto principal o ramas | 8-12 semanas | CRMN · USE Para confirmar cierre de fístula | Tras cierre de fístula confirmado |
| Pancreatitis crónica con seudoquiste Estenosis ductal subyacente | ≥ 12 semanas | CRMN · USE Valorar CPRE complementaria | Tras resolución y evaluación ductal |
| Retiro precoz Antes de resolución completa | < 4 semanas | — | No recomendado — alto riesgo de recurrencia |

CONCLUSION

Ultrasound ultrasound (US) is now the cornerstone of pancreatic pseudocyst diagnosis and management, integrating diagnostic accuracy, therapeutic safety, and a minimally invasive approach. Its correct use, aligned with current guidelines and appropriate device selection, optimizes clinical outcomes and reduces complications.

VIDEOS OF THE MONTH



ELUXEO 8000 SYSTEM



DRENAJE POR EUS DE UN SEUDOQUISTE DE PANCREAS
<https://qr.fy.io/p/bGpkQ2Hex4>

LITERATURE

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ARTICLE OF THE MONTH (10)

Pancreatic Pseudocysts: Evolution of Treatment Approaches

Kluszczczyk P, Tobiasz A, Madej A, Wosiewicz P, Mrowiec S, Jabłońska B. Pancreatic Pseudocysts: Evolution of Treatment Approaches. J Clin Med. 2025;14(17):6152. doi:10.3390/jcm14176152

Pancreatic pseudocysts (PPCs) are a common complication of acute and chronic pancreatitis, defined as encapsulated collections of pancreatic fluid. Their management has evolved significantly from open surgical approaches to increasingly minimally invasive techniques.

Conservative management remains a valid first-line option in asymptomatic and stable pseudocysts, especially in the absence of complications.

Traditional surgical techniques such as marsupialization, cystogastrostomy, cystojejunostomy, and cystoduodenostomy have become less common, reserved as alternatives when less invasive methods fail. The laparoscopic approach offers lower morbidity and faster recovery, especially in complex or difficult-to-access preterm infants.

However, endoscopic drainage guided by endoscopic ultrasound (EUS), using luminal apposition stents (LAMS) or plastic or metallic stents, has become the preferred modality due to its efficacy, safety profile, and cost-effectiveness. Emerging technologies, including robot-assisted surgery and hybrid techniques, promise to further refine the management of primary biliary cholangitis (PBC).