



Endoscopic Ultrasound – Guided Pancreatic Pseudocyst Drainage Without Fluoroscopy: A Radiation-Free Single-Center Experience

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Abstract

Background: Endoscopic ultrasound (EUS) – guided drainage is the preferred modality for pancreatic pseudocysts and is conventionally performed with fluoroscopic assistance. However, fluoroscopy exposes patients and operators to ionizing radiation.

Aim: To evaluate the feasibility, safety, and outcomes of EUS-guided pancreatic pseudocyst drainage performed without fluoroscopic guidance.

Methods: Fifty-six consecutive patients, including two pregnant women, with symptomatic pancreatic pseudocysts underwent EUS-guided drainage without fluoroscopy at a tertiary care center between January 2022 and December 2024. Drainage was performed using EUS guidance alone with needle puncture, guidewire placement, cystotome-assisted tract creation, balloon dilatation, and plastic stent deployment.

Results: Technical and clinical success was achieved in 100% of cases. No peri-procedural or early post-procedural complications were observed. Two double-pigtail stents were placed in selected cases(8) with thick or solid contents. Both pregnant patients had successful outcomes without adverse maternal or fetal events.

Conclusion: EUS-guided pancreatic pseudocyst drainage without fluoroscopy is safe, effective, and reproducible. This radiation-free approach is particularly advantageous in special populations such as pregnant patients.

Keywords: Endoscopic ultrasound, pancreatic pseudocyst, radiation-free, fluoroscopy-free, pregnancy.

Introduction

Pancreatic pseudocysts are common sequelae of acute and chronic pancreatitis and may require intervention when symptomatic, infected, or complicated. Endoscopic ultrasound (EUS) – guided drainage has become the standard of care due to its high success rate and favorable safety profile compared with surgical or percutaneous approaches.

Traditionally, EUS-guided pseudocyst drainage is performed with fluoroscopic assistance to confirm guidewire position and stent deployment. However, fluoroscopy exposes patients and healthcare personnel to ionizing radiation, which is of particular concern in vulnerable populations such as pregnant women. With advances in EUS imaging and accessories, it is now feasible to perform these procedures under exclusive EUS and endoscopic visualization.

In this study, we report our single-center experience with EUS-guided pancreatic pseudocyst drainage performed entirely without fluoroscopy.

Materials and Methods Study Design and Patients

This was a prospective observational study conducted at Yashoda Hospital, Secunderabad, India, from January 2022 to December 2024. Fifty-six consecutive patients diagnosed with pancreatic pseudocysts requiring intervention were included. Two patients were pregnant at the time of the procedure.

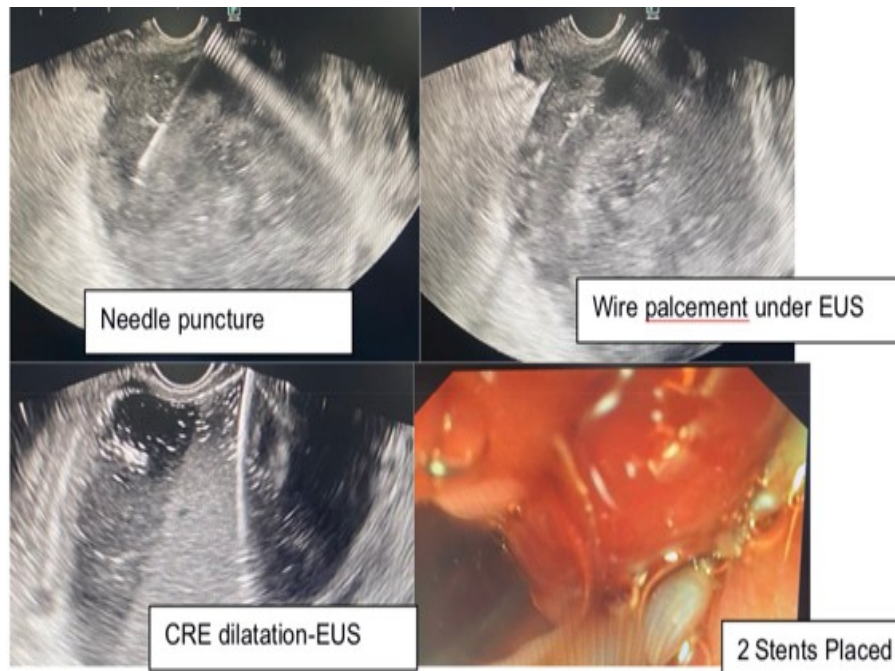
Indications for Drainage

Drainage was performed for symptomatic pseudocysts causing abdominal pain, gastric outlet obstruction, or persistent collections, as well as enlarging cysts on follow-up imaging.

Procedure Technique

All procedures were performed under conscious sedation or general anesthesia by experienced endosonographers.

1. Linear EUS was used to identify the pseudocyst and assess wall maturity and interposed vessels.
2. Puncture was performed using a 19G EUS needle.
3. A 0.035-inch guidewire was advanced and coiled within the cyst cavity under EUS visualization.
4. Cyst fluid was aspirated for decompression.
5. An 8 Fr cystotome was advanced over the guidewire to create the cystogastric or cystoduodenal tract.
6. Balloon dilatation was performed using a CRE balloon up to 8–10 mm.
7. A 10 Fr, 5 cm double-pigtail plastic stent was placed under endoscopic guidance.
8. Two stents were placed in cases with thick contents or significant solid debris.



Images-

- EUS guided needle puncture of cyst,
- Guidewire placement into collection
- Balloon dilation of tract
- Stenting with plastic pigtailed stent.

No fluoroscopy was used at any stage of the procedure. Outcome Measures

- Technical success: Successful stent placement.
- Clinical success: Resolution of symptoms and reduction of cyst size.
- Safety: Peri-procedural and early post-procedural complications.

Results

All 56 procedures were completed successfully with a 100% technical and clinical success rate. There were no immediate or early complications, including bleeding, perforation, infection, or stent migration.

Two stents were required in selected patients (8) with thick or partially solid-cyst contents. Both pregnant patients underwent successful drainage without radiation exposure and had uneventful clinical outcomes.

Discussion

This study demonstrates that EUS-guided pancreatic pseudocyst drainage can be safely and effectively performed without fluoroscopic guidance. High-quality EUS imaging allows precise needle puncture, guidewire placement, and tract dilation, eliminating the need for radiation.

Avoiding fluoroscopy is particularly beneficial in pregnant patients, where radiation exposure carries potential fetal risks. Additionally, this approach reduces procedure time, radiation burden to staff, and dependency on fluoroscopy-equipped endoscopy suites.

Our results align with emerging evidence supporting fluoroscopy-free EUS interventions in experienced hands. The absence of complications in our series underscores the safety of this technique when appropriate patient selection and expertise are ensured.

Limitations

This was a single-center study without a control group undergoing fluoroscopy-guided drainage. Long-term outcomes and stent-related complications were not assessed.

Conclusion

EUS-guided pancreatic pseudocyst drainage without fluoroscopy is a feasible, safe, and highly effective technique. It should be considered, especially in settings where radiation exposure must be minimized, such as in pregnancy.

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