Case Study ISSN 3069-8154

Journal of Surgery and Surgical Procedures

Hurdles and Challenges during Laparoscopic Enucleation of Insulinoma Head of Pancreas – An Interesting Case Report

Haridra Sundararajan[1], Venkatesan[1] and Easwaramoorthy Sundaram[2*]

[1]*Postgraduate Resident, Lotus Hospital and Research Centre, Erode, India.*

[2]*Chief of Dept of Surgery, Lotus Hospital and Research Centre, Erode, India.*

***Corresponding author**

Prof Dr. Easwaramoorthy Sundaram,

Department of Surgery, Lotus Hospital and Research Centre, Erode, Tamil Nadu, India.

Submitted : 26 Nov 2025 ; Published : 11 Dec 2025

Citation: Easwaramoorthy, S. et al., (2025). Hurdles and Challenges during Laparoscopic Enucleation of Insulinoma Head of Pancreas – An Interesting Case Report. *J Sur & Surgic Proce.,3*(4):1-5. DOI : https://doi.org/10.47485/3069-8154.1022

Abstract

Introduction: *Insulinoma is a rare neuroendocrine tumour of the pancreas presenting with hypoglycemia and associated symptoms. Laparoscopic excision is the standard of care. We present a case of an insulinoma who developed recurrent pancreatitis following enucleation and hence required ERCP and pancreatic duct stenting.*

Case Report: *We report a case of a 42-year-old female patient with complaints of frequent episodes of hypoglycemia, headache and jerky movement of all 4 limbs on and off past 2 years. She also had associated headache, fatigue and seizure-like activity. The last seizure episode was 2 days before admission. These symptoms were affecting her day-to-day activities. On one local visit, the patient was tested blood sugar level and showed < 50g/dL and on similar visits it turned out to be low and suspicion of intra-abdominal pathology. She underwent CECT abdomen, which showed suspicion of insulinoma and was referred to our institution for further management.*

Management: *Patient took Exendin uptake Scan(PET), MRI and confirming the diagnosis of insulinoma and no communicating ductal abnormality of pancreatic duct. Patient was planned for laparoscopic enucleation of nodular 2x2cm insulinoma head of pancreas. Post-operatively patient's sugar levels improved. After the specimen histopathology confirmed the same diagnosis, the patient was discharged. After 3 months of an asymptomatic period, she developed recurrent attacks of acute pancreatitis. The initial 2 attacks of pancreatitis were mild, and the patient improved on conservative management. Of the total 3 attacks of acute pancreatitis in 1 month, the last episode was severe, and the patient was not responding to IV medications. MRCP showed peri-pancreatic fluid collection at the head of the pancreas corresponding to the previous lesion. As a post-op complication patient developed pancreatitis with fluid collection. With ERCP and pancreatic duct stenting, fluid collection was drained and successfully managed.*

Conclusion: *We report a rare case of an Insulinoma head of the pancreas which was diagnosed incidentally. With the evolution of minimally invasive techniques, the patient was successfully managed by Laparoscopic enucleation of insulinoma and Endoscopic retrograde cholangiopancreatography (ERCP)+ pancreatic stenting.*

Keywords: Neuroendocrine tumor (NET), Insulinoma, Exendin uptake scan (PET), Enucleation, Endoscopic retrograde cholangiopancreatography (ERCP), Postoperative pancreatitis, Peripancreatic fluid collection.

Hurdles and Challenges during Laparoscopic Enucleation of Insulinoma head of pancreas – An Interesting Case Report

Insulinoma is a rare neuroendocrine tumour of the pancreas presenting with hypoglycemia and associated symptoms. Laparoscopic excision is the standard of care. We present a case of an insulinoma who developed recurrent pancreatitis following enucleation and hence required ERCP and pancreatic duct stenting.

Case Report

A 42-year-old working female presented with complaints of frequent episodes of hypoglycemia, headache and jerky movement of all 4 limbs on and off past 2 years. Patient was apparently normal before 2 years, after which she started having hypoglycemic episodes 4-5 times/day relieved after a meal or snack. She also had associated headache, fatigue and seizure-like activity. Her seizure-like activity was predominantly early morning after prolonged fasting during sleep thrice weekly. The last seizure episode was 2 days before admission. Previously, she had been going from hospital to hospital for symptomatic relief, undiagnosed. She has been evaluated for seizures and started on an anti-epileptic. Since her symptoms were disturbing during sleep, she was also on anti-psychotic medications. These symptoms were affecting her day-to-day activities. On one local visit, the patient's blood sugar level

was tested and showed < 50g/dL and on similar visits, it turned out to be low and following a suspicion of intra-abdominal pathology led to CECT Abdomen, which showed suspicion of insulinoma and referred to our hospital.

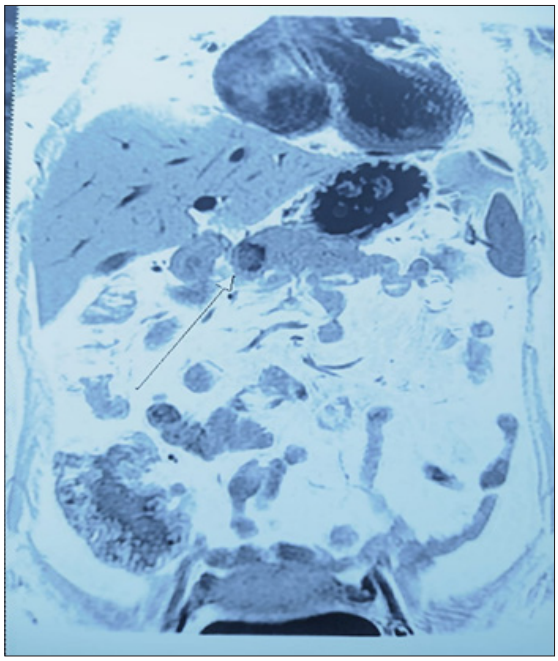

Figure 1: CECT hyperintensity lesion in the neck of the pancreas with rich vascularity and a central necrotic area.

Patient was admitted, measured serial blood glucose levels which showed <50 g/dL values.

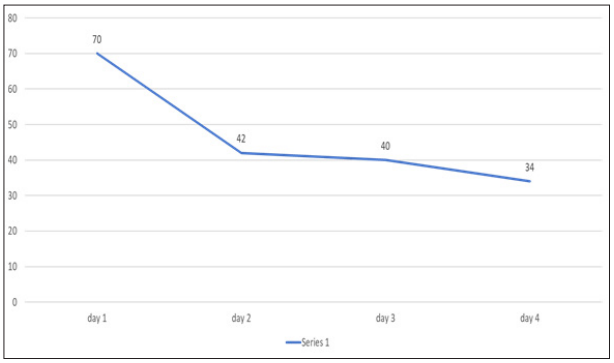

Figure 2: Serial measurement of Random glucose levels showing < 50g/dL. Basic blood investigation and c-peptide levels were taken,

Blood Tests	Results
Hemoglobin	8.9g/dL
Hct	29%
Platelet	3.43 Lakh/cumm
LFT	Normal
C-peptide Level	5.5ng/mL (1.1-4.4 ng/ml)

Table 1: C-peptide levels increased, raising the suspicion of Insulinoma

Patient was advised further imaging for diagnosis, anatomical location and confirmation.

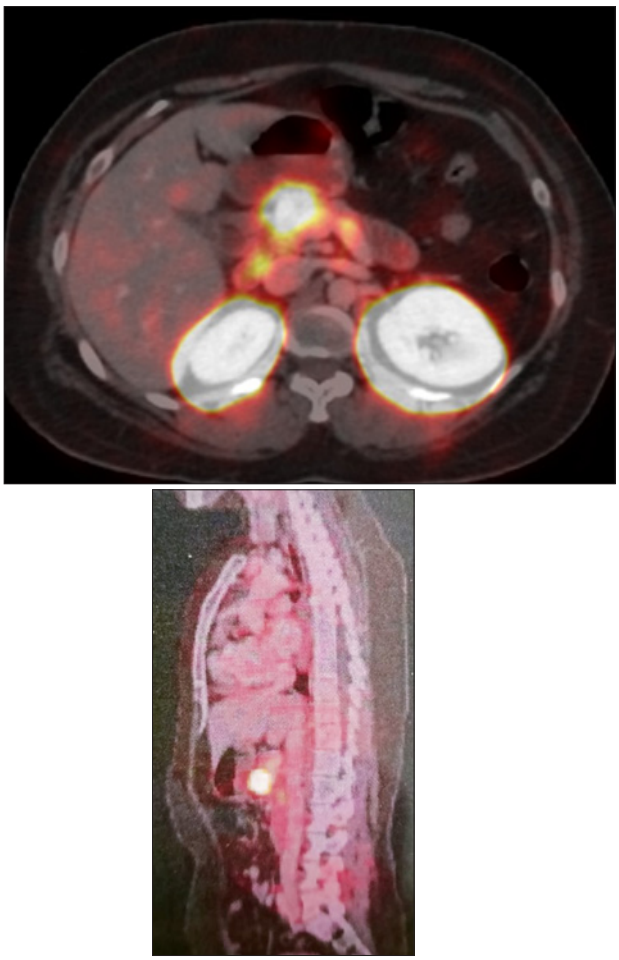

Figure 3: PET -CT (Exendin) – well-defined ovoid intra-pancreatic lesion of 1.8x1.1.5 cm in the neck of the Pancreas

As a part of a localisation study for pancreatic NETs, MRI was advised to rule out multifocality and communication with the pancreatic duct.

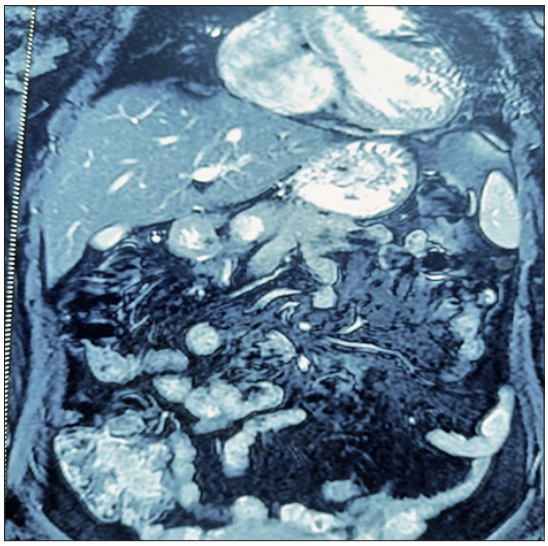

Figure 4: MRI – Heterogenous intra-pancreatic lesion showing arterial enhancement with a small eccentric necrotic component.

Oncologist's opinion was obtained, and with localisation of the neuroendocrine tumor head of pancreas with no multifocal or structural communication with pancreatic duct, the patient was advised for Laparoscopic excision of pancreatic insulinoma approach.

Under GA, the patient in the lithotomy position, pneumoperitoneum was created by the Veress needle technique. 5 ports were made.

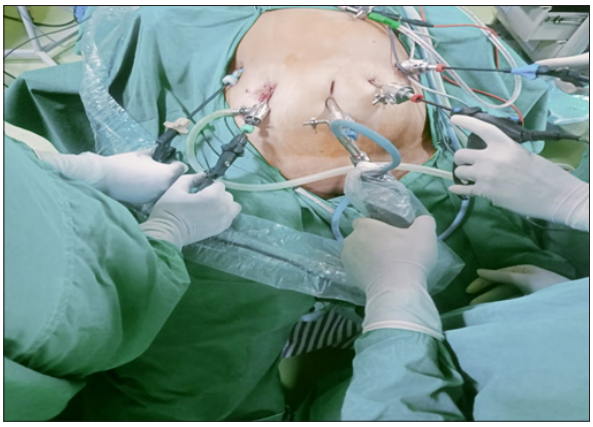

Figure 5: Patient and port position for laparoscopic pancreatic insulinoma

Greater omentum dissection was done along the greater curvature of the stomach. By dividing the greater omentum and entering the posterior surface of the stomach, the pancreas was visualised with nodular swelling at the head of the pancreas. Superiorly portal vein and liver; medially, the duodenum and middle colic vessels and inferiorly, the confluence of the Splenic vein & SMV were seen and preserved. The pancreas was delineated from surrounding important structures cautiously.

Insulinoma head of pancreas dissection initially started with diathermy hook and Maryland forceps. After dissecting off its base, enucleation of the lesion with Bipolar forceps was done in order to prevent peripheral thermal injury. Hemostasis was secured, and the base of the lesion was covered with omentum, and a drain was placed. Specimen retrieved via the endo-bag method.

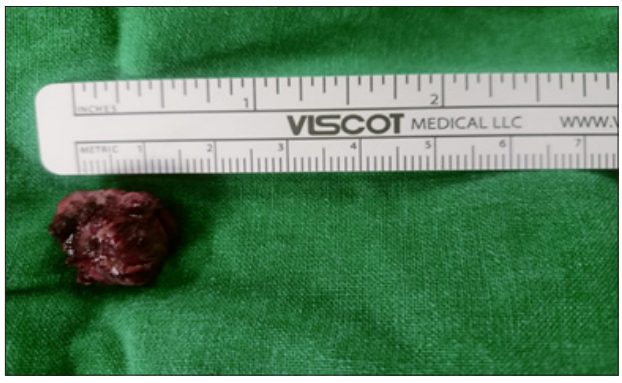

Figure 6: Insulinoma head of pancreas; Post-laparoscopic enucleated specimen

Patients' glucose levels postoperatively improved, and their symptoms improved. The patient was discharged after drain removal, and her amylase and lipase levels were normal.

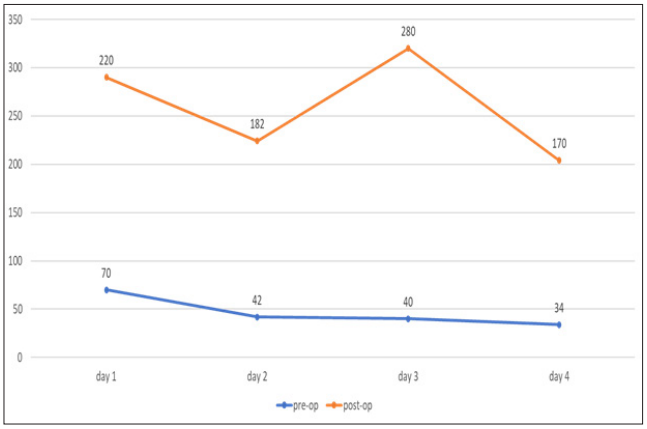

Figure 7: pre-op (blue) VS post-op (Red line) serial glucose levels showing an expected good outcome

Patient developed recurrent attacks of acute pancreatitis,> 3 episodes in 1 month, as a postoperative complication. The patient's last episode of pancreatitis was severe, with elevated amylase and lipase levels with deranged LFT. The patient underwent MRCP showing a peripancreatic collection. Hence patient was planned for ERCP.

The therapeutic ERCP scope was passed, and pancreatic duct cannulation was done under guide wire guidance.

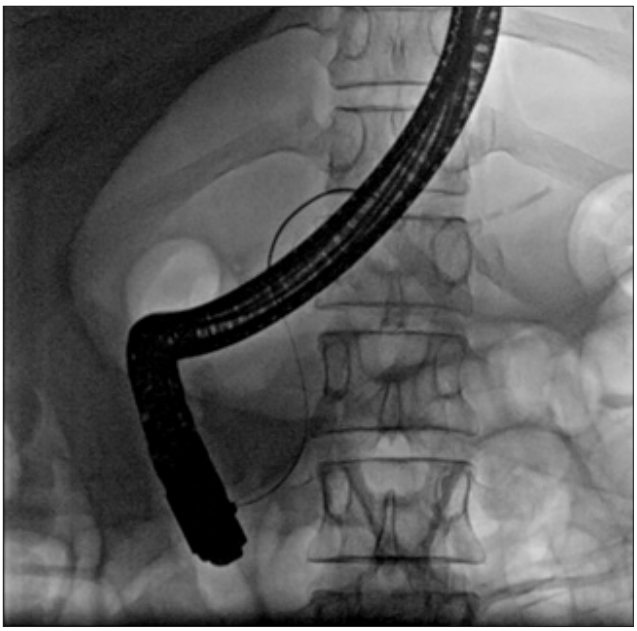

Figure 8: C-arm image showing ERCP guide-wire cannulation to the pancreatic duct

After cannulation, able to see rush of pancreatic juices was seen draining and a single pigtail pancreatic stent of size 10F x 7 cm was placed. The patient's pain significantly decreased postoperatively. Patient was discharged with follow-up after 3 weeks. Patient remained asymptomatic for 6 months.

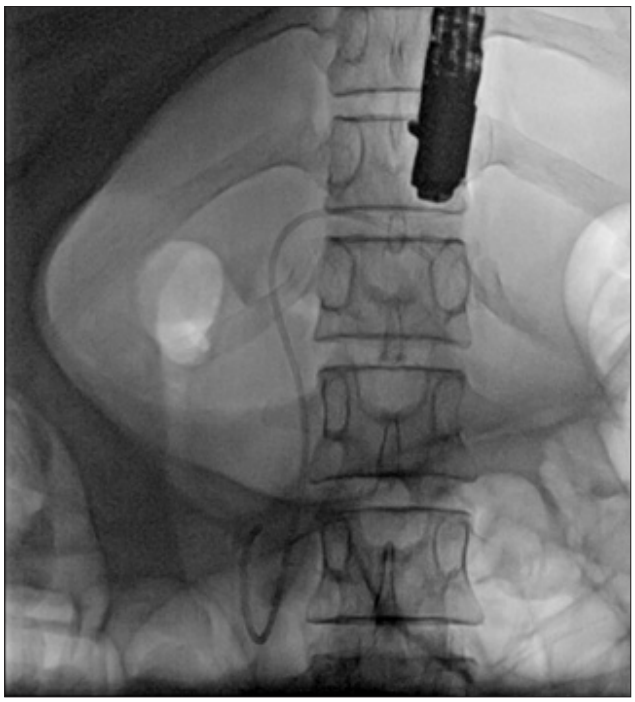

Figure 9: C-arm image showing pancreatic stent in situ

Discussion

Insulinoma

- Insulinoma is the most common pancreatic NET among all functional tumors (Mariën et al., 2022; Okabayashi et al., 2013).
- It can occur anywhere in the pancreas head/neck/body, or tail.
- It can be sporadic or familial, the former is most common.
- In case of familial tumours, it is often associated with Multiple Endocrine Neoplasia (MEN) type I syndrome
    1. parathyroid adenoma
    2. pituitary adenoma
    3. pancreatic Neuroendocrine tumor (Gastrinoma common than insulinoma)

Hence, one should rule out MEN syndrome in a suspected functional Pancreatic NET.

Clinical Features

Fatigue, tiredness, loss of consciousness, headache, blurring of vision, and seizures due to hypoglycemia are the prime symptoms.

Whipple's triad

- Symptoms of hypoglycemia
- Blood glucose level <50 g/dL
- Symptoms relief after glucose

Investigations (Shin et al., 2010)

- C-peptide levels
- DOTAPET – octreotide scan
- EUS – endoscopic ultrasound – highly specific
- MRI – Ductal anatomy

Treatment

- Medical management - Diazoxide (K+ channel opener); reduces insulin release (short term)
- Surgical management – enucleation/excision

Unresectable – Chemotherapy (5FU/Doxarubicin)

The first cure of hyperinsulinism following surgical removal of an insulinoma was reported in 1929 by the Canadian surgeon Roscoe R. Graham (1890-1948).

Role of ERCP in post-operative complications of pancreatic manipulation (Zhuo et al., 2025; Rychlewska-Duda et al., 2025).

- Endoscopic retrograde cholangiopancreatography (ERCP) plays an important therapeutic and diagnostic role in managing post-operative complications following pancreatic surgeries.
- Pancreatic surgeries often alter normal anatomy of pancreas causing potential complications such as Bile leak/pancreatic fistula/strictures or recurrent pancreatitis.
- These Complications can be managed successfully by ERCP Sphincterotomy /biliary balloon sweep/ CRE balloon dilation and stenting of appropriate size.
- Overall closure of pancreatic fistulas after ERCP with pancreatic duct stenting – 70-90%; Partial duct disruption >90%; complete duct disruption 50-60%

Mechanism by which ERCP and Pancreatic stenting helps in healing are:

1. lowers ductal pressure – pancreatic leaks occur because of ductal hypertension from obstruction, inflammation or duct disruption.
2. Redirecting pancreatic secretions into the duodenum – pancreatic stenting acts as an internal drainage channel, diverting pancreatic enzymes into the gut instead of the fistulous tract.
3. Bridging the leak – stent placed across the site of duct disruption, physically bridges the leak, creating a controlled lumen for secretions to pass, allowing the ruptured wall to granulate and heal.
4. local inflammation decreases – continuous leakage of pancreatic enzymes causes inflammation, autodigestion and impaired tissue repair. ERCP gives tissues a chance to regenerate without enzymatic damage

Conclusion

An insulinoma head of the pancreas is a rare pancreatic neuroendocrine tumour. With the evolution of minimally invasive techniques, the patient can be successfully managed by Laparoscopic enucleation of insulinoma, ERCP and pancreatic stenting. Will rescue the patient developing postoperative pancreatitis and pancreatic fistula. The role of ERCP in managing these complications was highlighted in this case with supporting literature and evidence-based outcomes.

References

1. Mariën, L., Islam, O., Van Mileghem, L., Lybaert, W., Peeters, M., & Vandamme, T. (2022). Pathophysiology and Treatment of Pancreatic Neuroendocrine Neoplasms (PNENS): New Developments. In K. R. Feingold., S. F. Ahmed., B. Anawalt., M. R. Blackman., A. Boyce., G. Chrousos., E. Corpas., W. W. de Herder., K. Dhatariya., K. Dungan., J. Hofland., S. Kalra., G. Kaltsas., N. Kapoor., C. Koch., P. Kopp., M. Korbonits., C. S. Kovacs., W. Kuohung., … D. P. Wilson (Eds.), Endotext [Internet]. South Dartmouth (MA). https://pubmed.ncbi.nlm.nih.gov/25905300/
2. Okabayashi, T., Shima, Y., Sumiyoshi, T., Kozuki, A., Ito, S., Ogawa, Y., Kobayashi, M., & Hanazaki, K. (2013). Diagnosis and management of insulinoma. *World J Gastroenterol, 19*(6), 829-37. DOI: doi: https://doi.org/10.3748/wjg.v19.i6.829
3. Shin, J. J., Gorden, P., & Libutti, S. K. (2010). Insulinoma: pathophysiology, localization and management. *Future Oncol, 6*(2), 229-37 https://doi.org/10.2217/fon.09.165
4. Zhuo, F., Menon, G., Anastasopoulou, C. Insulinoma. (2025). In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK544299/
5. Rychlewska-Duda, J., Lisiecka, J., Janik, M., Ufnalska, B., Konarska, A., Fabijański, A., Machowiak, A., Nowak, M., Firlej, W & Dukacz, A. D. (2025). Insulinomas: Comprehensive Review of Epidemiology, Pathophysiology, Clinical Manifestations, Diagnostic Approaches, and Treatment Options. Quality in Sport, 37, 5754`1. https://doi.org/10.12775/QS.2024.37.57541