

Laparoscopic enucleation of insulinoma

Enucleación laparoscópica de insulinoma

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ABSTRACT

Insulinoma is a neuroendocrine tumor that originates from the beta cells of the pancreatic islets, its incidence is low, and most of the time is treated by surgery. We present the case of a 51-year-old female patient with clinical symptoms corresponding to the Whipple's triad. A mass in the body of the pancreas revealed to be an insulinoma was identified by endoscopic ultrasound. Enucleation was done by laparoscopy.

RESUMEN

El insulinoma es un tumor neuroendocrino originado de las células beta de los islotes pancreáticos, su incidencia es baja y la mayor parte se resuelve de manera quirúrgica. Presentamos el caso de un paciente femenino de 51 años con cuadro clínico correspondiente a tríada de Whipple, se identifica por ultrasonido endoscópico una masa en el cuerpo del páncreas que por las características imagenológicas corresponde a un tumor neuroendocrino, se realiza una enucleación de insulinoma por laparoscopia.

INTRODUCTION

Insulinomas are neuroendocrine neoplasms that originate in the beta cells of pancreatic islets characterized by increased production of insulin. They are rare tumors.¹ The clinical diagnosis is based on Whipple's triad. The most frequent location of insulinomas is in the head and neck of the pancreas. The highest sensitivity for localization of insulinomas is an endoscopic ultrasound of 86.6 to 92.3%.²

The surgical approach to insulinoma depends on the size, proximity to the pancreatic duct, and the splenic vessels. Surgical resection is the treatment of choice with a cure rate in more than 90% of patients.³ Enucleation is indicated in benign small superficial tumors ≤ 3 cm in diameter, located farther than 2 mm from the pancreatic duct. Insulinomas of these characteristics are excellent candidates for laparoscopic resection.⁴

Laparoscopic approach is infrequent because of the deep location of the pancreas, the technical difficulty, and the need for experienced surgeons. Currently, the safety and efficacy of laparoscopic pancreatic resection have been described as reliable.

PRESENTATION OF THE CASE

A 51-year-old woman with no significant family history. She started her condition three years before her hospital admission with intermittent episodes of diaphoresis and palpitations. On arrival, she reported an oppressive frontal headache and had a capillary glycemia of 28 mg/dl. Her symptoms improved after ingestion of glucose-rich food. She was admitted because of a seizure. Her thorax was found with no alterations, her abdomen with abundant adipose panniculus, soft, non-painful, peristalsis present and normal, and the rest of the examination also without

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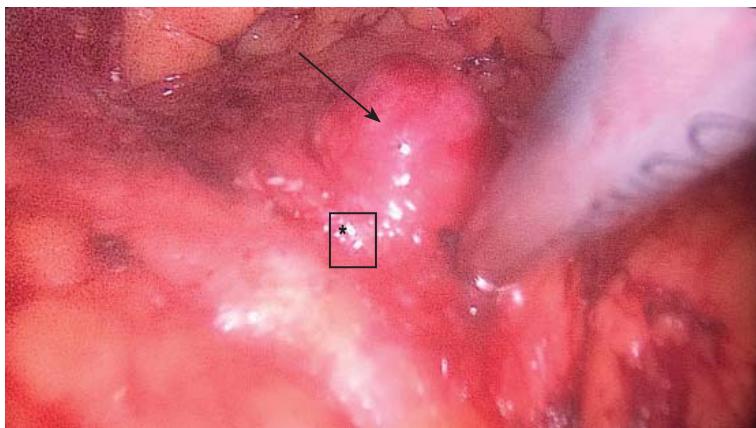
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Figure 1:

Endoscopic ultrasound showing a well-defined hypoechoic lesion (arrow). The pancreatic duct (asterisk) is seen distal to the lesion.



pathological data. Her laboratory studies showed glycosylated hemoglobin of 4.5%, negative blood sulfonylureas, glucose 37 mg, insulin 64.1 IU/ml, C-peptide 8.36 ng/ml, TSH 1.8 IU/ml, T4L 1.11 ng/dl. A contrast-enhanced CT scan of the abdomen was reported normal. Magnetic resonance imaging (MRI) showed a nodular lesion between the head and body of the pancreas of $2.0 \times 1.8 \times 1.6$ cm, which did not produce obstruction. Endoscopic ultrasound (Figure 1) corroborated the superficial location of the tumor, distant more than 2 mm from the splenic vessels and the pancreatic duct. Given its size and location, a laparoscopic enucleation was done. Pneumoperitoneum was produced, ports placed in the umbilicus (10 mm), another one for the hepatic retractor in the right anterior axillary line (10 mm), two left and one right port (5 mm). After dissection of the gastrocolic omentum, the stomach retracted upwards and

**Figure 2:** Enucleation of insulinoma by laparoscopy. The insulinoma (arrow) can be seen between the head and body of the pancreas (asterisk).

the tumor was detected between the body and tail of the pancreas (Figure 2). Enucleation was done with a harmonic scalpel and the tumor was removed from the abdominal cavity using a bag through the assistant's port.

The glucose concentration elevated after removal of the tumor and insulin administration by infusion pump was started. Ports were removed under direct vision, the skin was closed in planes with Vicryl 0-0. A closed Jackson-Pratt drain was placed. Cephalexin 500 mg was given every eight hours for three days. The patient was discharged on the seventh day. She tolerated her diet and her glucose was within normal parameters. The drain was removed after 14 days without complications. The histopathological diagnosis was insulinoma.

DISCUSSION

Laparoscopic enucleation of insulinoma is a safe and effective option, with a short hospital stay and rapid patient recovery. It is indicated in cases of single benign insulinoma smaller than 2 cm and in malignant insulinomas that do not require pancreatic reconstruction.⁵ Transoperative ultrasonography is the most effective technique to confirm the pancreatic anatomy and decide the surgical technique.³ The main reason for converting to open surgery is the inability to locate the tumor, with a conversion rate of 20 to 33% of cases.⁴

Blood loss is significantly lower when resection is performed laparoscopically.⁵ Morbidity with the laparoscopic approach (32%) is lower than with laparotomy (40.5%).⁵ Surgical time does not vary significantly between the two, $p > 0.71$.⁶ Gastrointestinal function recovery time was lower with laparoscopy $p < 0.0001$ compared to hospital stay between 4 to 7 days in patients who underwent laparotomy $p < 0.00001$.⁵ The percentage of complications is higher with laparoscopy, 27% vs 15% laparotomy.⁷ Pancreatic fistula is the main complication in pancreatic resections with an incidence of more than 27%. The frequency is equal for both approaches.⁸ Factors favoring the formation of a pancreatic fistula are body mass index greater than 27, extensive pancreatic resection ≥ 8 cm, and a blood volume loss ≥ 150 ml.⁹ Mortality in laparotomy is 3.7%, there

are no data yet for laparoscopy. Recurrence of insulinomas is rare and long-term survival is 100% at five years and 96% at 10 years.¹⁰

CONCLUSION

Surgical resection of insulinomas by laparoscopy is an appropriate technique in patients with tumors whose location and size allow it. The success of surgery will depend on an adequate preoperative study by the different imaging studies and patient characteristics. The difference in surgical time is not significantly greater with the laparoscopic approach.

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Ethical considerations and responsibility:

Data privacy. In accordance with the protocols established at the authors' work center, the authors declare that they have followed the protocols on patient data privacy and preserved their anonymity.

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