



IJBCM

International Journal of Basic and Clinical Medicine
Uluslararası Temel ve Klinik Tıp Dergisi

Case Report / Olgu Sunumu

IMPORTANCE OF TOGETHER USE OF ENDOSCOPIC AND INTRAOPERATIVE ULTRASONOGRAPHY IN THE DIAGNOSIS AND TREATMENT OF INSULINOMA

İnsülinoma Tanı Ve Tedavisinde Endoskopik Ve İntraoperatif Ultrasonografinin Birlikte Kullanımının Önemi

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ABSTRACT

Introduction: Insulinoma is a usually benign tumor of pancreas. It is seen rarely and incidence of insulinoma is 1 in 250,000 patient-years. We present a rare case with insulinoma which well diagnosed and treated with aid of endoscopic and intraoperative ultrasonography.

Case Report: A patient involving a 39-year-old woman with complaints of cold sweats, weakness, syncope attacks, palpitations was evaluated in polyclinic. She was hospitalized with the diagnosis of pancreatic insulinoma after abdominal computer tomography(CT), magnetic resonance imaging(MRI) endoscopic ultrasonography(EUS), and biochemical parameters. The patient was well treated with enucleation and after imaging aid of endoscopic and intraoperative ultrasound(IOUS).

Discussion: In patients with insulinoma, preoperative localization of tumor is most important for diagnosis and treatment. Therefore; CT scanning, MRI, EUS and SPECT / CT are used for diagnosis of insulinoma. Together use of endoscopic and intraoperatively ultrasonography are increasing recently. Enucleation is a curative treatment approach in insulinoma.

Conclusion: Together using of preoperative endoscopic and intraoperative ultrasound is quite helpful in the diagnosis and treatment of insulinoma.

Key words: Endoscopic ultrasonography(EUS), enucleation, intraoperative ultrasonography(IOUS), insulinoma.

ÖZET

Giriş: İnsülinoma pankreasın genellikle benign tümörüdür. Yıllık insidansı 250.000'de 1'dir ve nadir görülmektedir. Tanı ve lokalizasyon amaçlı olarak endoskopik ve intraoperatif ultrasonografinin kullanıldığı ve başarılı bir şekilde tedavi edilen insülinomalı hasta sunuldu.

Olgu Sunumu: 39 yaşında bayan hasta uzun süre aç kalması sonucu artan, soğuk terleme, halsizlik, bayılma ve çarpıntı şikâyetleriyle poliklinikte değerlendirildi. Batın bilgisayarlı tomografi(BT), manyetik rezonans görüntüleme(MRG), endoskopik ultrasonografi(EUS) ve biyokimyasal parametrelerden sonra hasta insülinoma tanısıyla yatırıldı. Hastaya EUS ve intraoperatif-USG(IOUS) yardımıyla enükleasyon yapıldı.

Tartışma: İnsülinomalı hastalarda ameliyat öncesi kitlenin lokalizasyonu çok önemlidir. Bu yüzden BT tarama, MRG, EUS ve SPECT/BT tanı amaçlı olarak kullanılmaktadır. Son zamanlarda EUS ve IOUS'un birlikte kullanımı artmaktadır. İnsülinomada küratif tedavi yöntemi enükleasyondur.

Sonuç: İnsülinoma'nın tanı ve tedavisinde, endoskopik ve intraoperatif ultrasonografinin birlikte kullanımı oldukça yararlıdır.

Anahtar kelimeler: Endoskopik ultrasonografi, enükleasyon, intraoperatif ultrasonografi, insülinoma

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Article History / Makale Geçmişi:

Date Received / Geliş Tarihi: 01.03.2015
Date Accepted / Kabul Tarihi: 30.07.2015
Int J Basic Clin Med 2016; 4(2):74-8

INTRODUCTION

Insulinoma is one of the most common endocrine tumors of pancreas.¹ The incidence of insulinoma is 1-4/ 1.000.000 in the general population, can be seen any age and usually occur with equal frequency in men and women.²

Symptoms of insulinoma patients often include syncopal episode, palpitations, trembling, diaphoresis, confusion or obtundation, and seizure, and family members may report that the patient has undergone a personality change.³⁻⁵

Insulinomas are usually localized with computer tomography (CT) scanning, magnetic resonance imaging (MRI), Single-photon Emission Computed Tomography (SPECT/CT) endoscopic ultrasonography (EUS) and sometimes is used intraoperative ultrasonography (IOUS). Technical advances in EUS and IOUS have led to preoperative and peroperative identification of >95% of insulinomas.⁶⁻⁹ The majority (90%) of insulinomas are benign and solitary and they are generally cured by simple enucleation.^{8,11}

Here, we report a rare case of insulinoma diagnosed with IUS and treated by simple enucleation.

CASE REPORT

A 39-year old premenopausal woman was referred to our department for with complaints of cold sweats, weakness, syncope attacks and palpitations which has 8 years and increased by long fasting hypoglycemia. There was not any medical treatment her medical history and her body mass index (BMI) was 22

kg/m². On physical examination, there was epigastric tenderness and other systems were normal. In laboratory analysis, fasting blood glucose was 57 mg / dL, levels of insulin 49.3 IU / mL (normal 2 to 5) and C-peptide 5.66 pmol/ml (normal 0.15 to 1.30) and level of calcium was 8.8 mg/dl (normal 8.5 to 10.2). The patient was admitted to our clinic and began to frequently monitoring of blood glucose. A mass was determined by contrast-enhanced CT and MRI which diameter was of 12 mm and in the pancreatic tail (Figure 1). The pituitary gland and parathyroid tissue were normal in MRI, USG and scintigraphy. Octreotide also found within normal limits of findings. Thereupon, Endoscopic ultrasound (EUS) was performed and found a mass diameter of 12.9 mm which was well-circumscribed, hypoechoic and close to the pancreatic tail (Figure 2). In addition to, endocrinology consultation was made and taken her suggestions. Surgery treatment was planned with IOUS. She was prepared for the operation and had ASA-II (American Society of Anesthesiologists). A supraumbilical median laparotomy was performed under general anesthesia and gastrocolic ligament was opened. On exploration, a mass was palpated vaguely located close to tail of the pancreas. With intraoperative ultrasound, was evaluated other parts of the pancreas and assessed the relationship with of the mass with the splenic vein and pancreatic channel. The capsule of intact pancreatic was opened and slightly dissected pancreas tissue by electrocautery and then, was reached the mass. Enucleation was performed with hemostasis (Fig. 3). A drain was placed to pancreatic loge and abdomen was closed anatomically. The blood glucose was 66 mg/ dl intraoperatively and

after the mass resection, blood glucose was 164 mg / dl. The patient was taken intensive care of general surgical and was made the close monitoring of blood glucose in terms of rebound hypoglycemia. Blood glucose remained between 120-160 mg / dl and she was taken to service after 48 hours from the operation. The blood glucose was varied between 80-130 mg / dl after oral feeding. A well-differentiated pancreatic endocrine tumor with intermediate grade is reported with negative surgical margins. Chromogranin, synaptophysin, pancreatin and neuron-specific enolase (NSE) were positive as an immunohistochemical and Ki-67 is positive in rate of 4-5 % in areas where high (Fig. 4,5). The patient was discharged with healing after 8 days from surgery. Her general condition is now good and is followed up with outpatient.



Fig 3. Surgical specimen of insulinoma

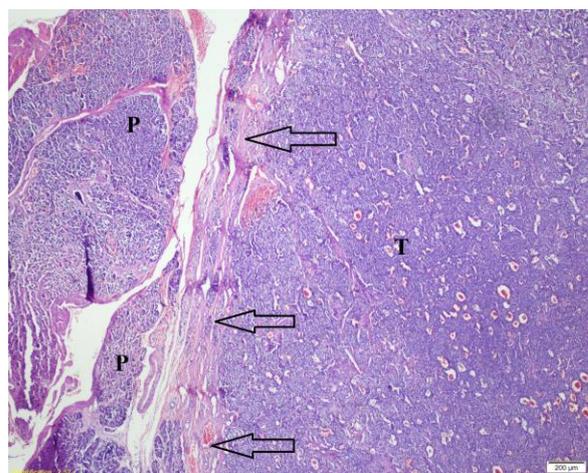


Fig 4. Pancreatic endocrine tumor with well demarcation and partly encapsulated. Neoplastic cells are round to ovoid, uniform with eosinophilic cytoplasm (P, T, and arrows indicate Normal Pancreatic Parenchyma, Tumor, and Line of demarcation, respectively) (H&E, x40).

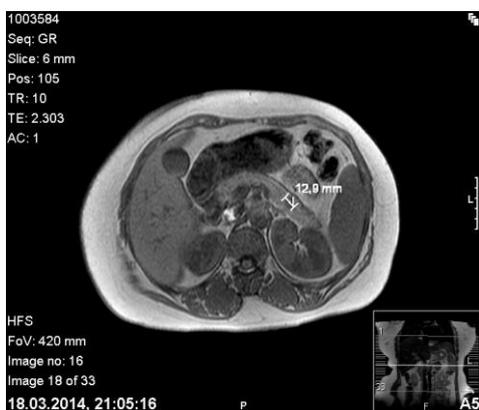


Fig 1. Insulinoma with MR (Marked)



Fig 2. Insulinoma with EUS (Arrows)

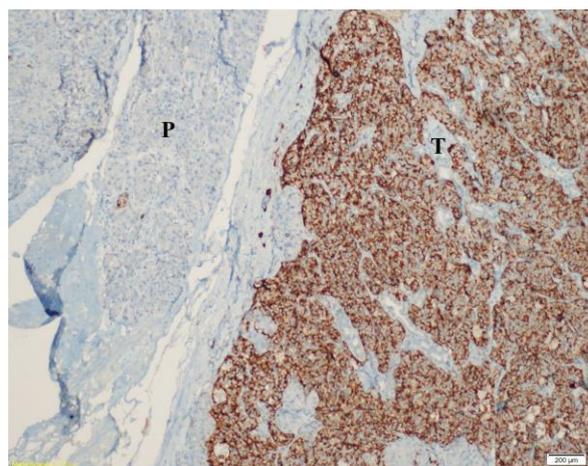


Fig 5. Diffuse strong expression of Chromogranin A in tumor cells, and positive staining was observed in a normal islet embedded in normal pancreatic parenchyma (P, and T indicate Normal Pancreatic Parenchyma and Tumor) (Immunostaining, x100).

DISCUSSION

Insulinoma is the most common endocrine tumor of pancreas resulting from pathology of islet cells.¹ Incidence of insulinoma is 1 in 250,000 patient-year.^{1,2} Etiopathogenesis is not clearly understood, is formed by excessive activation of the insulin-secreting beta cells.² It usually occurs sporadically (higher than 90%) or constitute a part of multiple endocrine neoplasia type 1 (MEN-1) (10%).¹⁻³

The patients with insulinoma are usually presented with a typical syndrome known as Wipple triad 3 and Whipple triad consists of symptomatic fasting hypoglycemia, serum glucose level fewer than 50 mg/dL, and relief of symptoms with the administration of glucose.^{3,4} In addition to, there are other symptoms such as syncopal episode, palpitations, trembling, diaphoresis, confusion or obtundation.⁵ Shreenivas et al⁶ reported that a rare case of insulinoma had with postprandial hypoglycemia. In our patient, there were cold sweats, weakness, syncope attacks and palpitations after prolonged fasting.

The pancreas is may be the most unforgiving organ and situated deep in the center of the abdomen and so, diagnosis of pancreatic disease such as insulinoma and other diseases can delayed. In diagnosis of insulinoma clinical, laboratory findings and imaging techniques can be used together.³⁻⁶ The levels of glucose, insulin and C-peptide are measured periodically by the 72-hour fasting test, and diagnosis can be made substantially.⁶ Patients with hypoglycemia symptoms, in that level of insulin higher than 0.6 ng / ml (0.2 nmol / l) and level of C-peptide higher than 6 pmol/ml are diagnostic for

insulinoma.^{6,7} Our patient also had symptoms of hypoglycemia, higher levels of insulin and C-peptide.

Preoperative localization methods include CT scanning, MRI, EUS, and SPECT or SPECT / CT for insulinoma. Kaczirek et al.⁸ reported in 67 patients that insulinoma was localized by conventional CT in 33%, single-slice helical CT in 58%, multi-detector CT in 100%, MRI in 85% and invasive angiography in 65%. Sadowski et al.⁹ were used successfully Gallium-Dotatate PET/CT for their insulinoma patient. Recently, EUS and guided fine-needle biopsy (EUS-guided FNA) is increasing the use of preoperative diagnosis.⁹ However, intraoperative ultrasound is used less and Gourgiotis et al¹⁰ determined that sensitivity of insulinoma is close to 100 % with the use of ultrasound and palpation during the operation. IOUS succeeded in localizing insulinoma in 66.67% of the cases. Intra-operative ultrasound helps in avoiding blind surgical procedures, decreased major vascular complications and may aid to identify any additional lesions.^{8,9} In our patient, intraoperative ultrasound was used and it was provided us with significant benefits.

Simple enucleation is the gold standard in the treatment of insulinoma.^{8,9} Radiofrequency ablation (RFA), intra-arterial chemotherapy, aggressive surgery (liver resection, lobectomy) and sometimes liver transplantation should be considered for liver and lymph node metastasis.¹⁰ However, simple excision (enucleation) with negative surgical margins is recommended that suitable patients. In our patient, cure was achieved by enucleation after imaging aid of endoscopic and intraoperative ultrasound.

CONCLUSION

Insulinoma is rare disease which can be difficult to diagnose. Therefore, together using of preoperative endoscopic and intraoperative ultrasound is very helpful in the diagnosis and treatment of insulinoma.

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