Pancreatic lipoma : a not so rare entity

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Abstract

Pancreatic neoplasms are well-known pathological entities with generally poor prognosis. Mesenchymal tumors comprise 1 to 2% of all pancreatic tumors, and lipomas are a very rare variant of them. There are benign mesenchymal tumors consisting of mature adipose cells and thin collagen capsule. Most of the cases are generally published as sporadic case reports. The present review aims to elucidate the morphological entity named pancreatic lipoma, which is nearly unknown to most of surgeons.

We estimate that pancreatic lipomas may be more common than previously realized, as small incidental lipomas may not have been reported in the literature to date. (Acta gastroenterol. belg., **2009**, 72, **235-237**).

Introduction

Pancreatic neoplasms are well-known pathological entities with generally poor prognosis. Mesenchymal tumors comprise 1 to 2% of all pancreatic tumors (1), and lipomas are a very rare variant of them. These are benign mesenchymal tumors consisting of mature adipose cells and thin collagen capsule. The morphologic entity of a pancreatic lipoma was explored and presented to the world by Bigard in 1989 (2). Between 1989 and 1995, two more authors wrote case reports presenting a total of two pancreatic lipomas (3, 4). In 1995 Itai (5) presented the first case series, while DiMaggio (6) in 1996 presented the first case depictured by CT. Since then, only two more case series appeared one by Hois (7) and one by Karaosmanoglu (8) presenting 5 and 17 cases respectively. Furthermore, between 1996 and 2008 several case reports with or without literature review were published (9-23).

In total, between 1989 and July 2008 we found 26 articles that described 54 cases in the world literature (Pub Med and Scopus were searched). Based on the reported 54 cases we created a database with patients' characteristics and we reviewed the data concerning pancreatic lipoma in order to elucidate this uncommon morphological entity.

Epidemiological data

Pancreatic lipomas are rare tumors. Concerning their lipomatous nature, we know that the most common site for gastrointestinal lipomas are the large bowel (75%), the small bowel (20%) and the stomach (~5%) (16). Lipomas can also occur in the pelvis and in the mesentery and, rarely, in organs such as the pancreas (16). Xu *et al.* (24) found 1 lipoma among 169 cases of duodenal-protruding lesions (0.59%), while Hois *et al.* (7) described 5 cases after analysing 6000 CT examinations (0.083%). This suggests that pancreatic lipomas may not be as rare as previously assumed, as small incidental lipomas may not have been reported in the literature to date, relatively to their actual incidence.

Pancreatic lipoma is an uncommon pancreatic tumor that evenly affects male and female subjects, and most surgeons agree that the mean age of tumor nascency in adults is after the 6th decade. Among 46 patients (85%) analysed in the present article, 21 were men and 25 were women (1:1.19). Mean age of the 47 patients (87%) with available age data was 61 years (ranging from 1 to 84 years).

Pathophysiology

Etiopathogenesis of the pancreatic lipomas is unclear. It has been proposed that they are trapped adipose tissue during the posterior rotation of the ventral pancreatic bud (7). The ventral pancreatic bud is the precursor of the pancreatic head and uncinate process, whereas the dorsal bud forms the body and the tail. Although this theory seems reasonable for the lipomas located at the head and the uncinate process, the explanation for the lesions at the body and the tail remains obscure. The shape of the lesion also seems to differ among patients.

Clinical and morphological features

Pancreatic lipomas are mostly asymptomatic (31 patients, 74%) and constitute an incidental finding on examinations for other pathologies or screening. In some cases (10 patients, 24%) pain is the prominent symptom leading to radiologic exploration. Finally, in one case (2%) jaundice was the prominent symptom.

The most common localization site of the tumor was the head (16 patients, 34%) and the tail (14 patients, 29%) followed by the uncinate process (7 patients, 15%), the body (4 patients, 8%), the neck (4 patients, 8%), the body and tail (2 patients, 4%), and the head and body

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(1 patient, 2%). Mean diameter of the tumor was found to be 5.91 cm (range 0.4 to 30 cm).

Diagnosis

The diagnosis of pancreatic lipomas, as reported in the various reports, included investigation with ultrasonography, computer tomography (CT), magnetic resonance imaging (MRI), positron emitting tomography (PET), histology, endoscopic ultrasonography and fine needle aspiration.

Lipomas are well-circumscribed masses that are composed of fat, contain a few scattered septa or vessels but do not have identifiable pancreatic parenchyma. Ultrasonography usually shows round, solid and hyperechoic masses (2, 5, 6, 9, 13, 17, 21, 23). Furthermore, they are readily recognized on CT (5, 6, 25). The tumor is usually well defined on CT and independent of the surrounding parenchyma, without infiltrations of peripancreatic fat. The lipomas' densities are characteristic for fat and are measured between -25 and -150 Hounsfield Units (HU).

MRI is helpful in showing the definite boundaries of fat in lipomas (10). With T1 and T2 weighting, pancreatic lipomas follow the signal intensity of the adjacent subcutaneous fat. On T1-weighted images, mature adipose tissue demonstrates high signal intensity, whereas T2-weighted images display decreased signal intensity (26). Like CT, MRI does not show contrast enhancement.

The nuclear medicine literature report that lipomas lack 18-F-fluoro-2-deoxy-D-glucose (FDG) accumulation on PET scans (27). However, in one case report a false-positive PET examination of a pancreatic lipoma was documented. Although the reason of this focal FDG uptake could not be exactly explained, the authors postulated that abnormally vascularisation or the presence of brown fat in the lipoma accounted for focal PDG uptake (28, 29).

Histologic confirmation is considered by many authors (6, 26) not necessary. The diagnosis of pancreatic lipoma can be made on the basis of CT findings alone, as the lesions are identical in appearance to lipomas found elsewhere in the body. Histology is obligatory only when malignancy is suspected.

Recently Di Matteo *et al.* (30) were prompted to use endoscopic ultrasonography (EUS) to resolve a problem of differential diagnosis of focal fat-containing mass of the head of pancreas. EUS allowed detailed morphologic examination of the lesion and, more importantly, provided the additional tool of FNA capability. EUS-guided FNA has also largely supplanted percutaneous FNA for sampling lesions in the pancreas because transabdominal puncture may give inaccurate results (2), especially in small pancreatic lesions and carries the risk of complications such as tumor seeding and pancreatic fistulas.

In conclusion, CT imaging is the main radiographic modality necessary for definite diagnosis of a pancreatic lipoma. When malignancy is suspected the EUS with guided FNA should be the diagnostic modality of choice

Differential diagnosis

The technological advances made the incidental discovery of pancreatic lipomas less rare. However, one must not forget that a variety of fat-containing abnormalities may be revealed by abdominal CT. Differential diagnosis must include all focal fat-containing masses of the pancreas such as teratoma (31, 32), liposarcoma (33-36), focal fatty infiltration (5, 25), malignant fibrous histiocytoma (37, 38), lipomatous pseudohypertrophy (25), leiomyosarcoma (39), desmoid tumor (40), and fibrolipoma (41).

Therapy

Treatment of pancreatic lipomas varies according to their presentation. Since accurate CT eliminates the need for biopsy, asymptomatic lipomas should be managed without resection (2-6, 9, 10, 12, 25). Radiologic monitoring of the patient is necessary every 6 to 12 months with US and every 2 to 5 years with CT. Concerning symptomatic lipomas a case by case study is necessary (25). When acute pancreatitis is the main symptom then the treatment of the acute condition is imperative (3, 6, 9). Supporting the patient and having him overpass the acute episode is the aim of the treatment. When multiple episodes occur, excision of the tumor is imperative and the surgeon should choose the appropriate operation. Finally, if pancreatic lipomas lead to obstructive conditions, surgical approach should be directed to decompression or bypass (3).

Prognosis

In general, the prognosis of pancreatic lipomas is good, since they are benign neoplasms of the pancreas (2-26, 30). Clinical progress seems to be silent, and no diagnostic or therapeutic intervention seems to be relevant, unless the lesions are very large, obstructing the bile flow or the vascular structures.

International literature supports the concept that these tumors should be monitored if they are asymptomatic (6-8), while surgical excision must be reserved to symptomatic patients when necessary (25). Operations must be as conservative as possible because of the relatively benign nature and the encapsulated form of the neoplasm.

Summary

The lipomas of the pancreas are very rare and only 54 cases have been reported up to date. The mean age of appearance is 61 years old with slight predominance of the female gender. Clinically the lipoma is mostly asymptomatic appearing as incidental mass during screening. CT examination is usually sufficient for definite diagnosis. Histologic confirmation is not necessary, but when obligatory FNA should be done with the aid endoscopic ultrasonography. Diagnosis of the lipoma does not require treatment when asymptomatic.

Radiologic monitoring of the patient is necessary every 6 to 12 months with US and every 2 to 5 years with CT. The prognosis of the tumor is excellent.

We estimate that pancreatic lipomas may be more common than previously realized, as small incidental lipomas may not have been reported in the literature to date.

References

1. FERROZZI F., ZUCCOLI G., BOVA D., CALCULLI L. Mesenchymal tumors of the pancreas : CT findings. *J. Comput. Assist. Tomogr.*, 2000, **24** : 622-627.
2. BIGARD M.A., BOISSEL P., REGENT D., FROMENT N. Intrapancreatic lipoma : First case in the literature. *Gastroenterol. Clin. Biol.*, 1989, **13** : 505-7.
3. DE JONG S.A., PICKLEMAN J., RAINSFORD K. Non-ductal tumors of the pancreas : the importance of laparotomy. *Arch. Surg.*, 1993, **128** : 730-6.
4. BOGLINO C., INSERRA A., SILVANO A., CIPRANDI G., BOLDRINI R., CAIONE P. Intrapancreatic lipoma : A case report. *Pediatr. Med. Chir.*, 1993, **15** : 397-9.
5. ITAI Y., SAIDA Y., KUROSAKI Y., FIJIMOTO T. Focal fatty mases of the pancreas. *Acta Radiol.*, 1995, **36** : 178-81.
6. DI MAGGIO E.M., SOLCIA M., DORE R., PREDA L., LAFIANZA A., RODINO C., CAMPANI R. Intrapancreatic lipoma : First case diagnosed with CT. *AJR*, 1996, **167** : 56-7.
7. HOIS E.L., HIBBELN J.F., SCLAMBERG J.S. CT appearance of incidental pancreatic lipomas : a case series. *Abdom. Imaging*, 2006, **31** : 332-8.
8. KARAOSMANOGLOU D., KARCAALTINCABA M., AKATA D., OZMEN M., AKHAN O. Pancreatic lipoma computed tomography diagnosis of 17 patients and follow-up. *Pancreas*, 2008, **36** : 434-6.
9. MERLI M., FOSSATI G.S., ALESSIANI M., SPADA M., GAMBINI D., VIEZZOLI A., DI MAGGIO E., VAILATI A., BREYER S., PALTRO R., ZONTA A. A rare case of pancreatic lipoma. *Hepatogastroenterology*, 1996, **43** : 734-6.
10. SECIL M., IGCI E., YIGIT A., DICLE O. Lipoma of the pancreas : MRI findings. *Computerized Medical Imaging and Graphics*, 2001, **25** : 507-9.
11. RYAN M.F., HAMILTON P.A., SMITH A.J., KHALIFA M. Radiologic features of pancreatic lipoma. *Can. Assoc. Radiol. J.*, 2003, **54** : 41-44.
12. RAUT C.P., FERNANDEZ-DEL CASTILLO C. Giant lipoma of the pancreas : a case report and review of lipomatous lesions of the pancreas. *Pancreas*, 2003, **26** : 97-9.
13. BARUTCU O., CIHANGIROGLU M., YILDIRIM T., KAYASELCUK F., NOYAN T. Fat containing unusual tumor of the pancreas *Eur. Radiol.*, 2002, **12** : 770-3.
14. ERDEM L.O., ERDEM C.Z., COMERT M. Intrapancreatic lipoma and Morgagni hernia : a previously unrecognised association. *Dig. Dis. Sci.*, 2004, **49** : 1962-5.
15. BEAN M.J., FISHMAN E.K. Focal FDG uptake in a pancreatic lipoma mimicking malignancy. *J. Comput. Assist. Tomogr.*, 2005, **29** : 475-6.
16. BOZGEYIK Z., KOCAKOC E., KOC M. Education and imaging. Hepatobiliary and pancreatic : pancreatic lipoma. *J. Gastroenterol. Hepatol.*, 2008, **23** : 161.
17. SALMAN MONTE Z., RUIZ-CABELLO JIMINEZ M., PARDO MORENO P., MONTORO MART NEZ P. Lipoma of the pancreas : diagnosis and management of these rare tumors. *Rev. Esp. Enferm. Dig.*, 2006, **98** : 884-6.
18. MAGENTA BIASINA A., CURTI A., BONIFACIO C., SOLDI S., CORNALBA GP. CT diagnosis of pancreatic lipoma : a case report and Literature review. *Radiol. Med. (Torino)*, 2002, **104** : 367-9.
19. MAZET N., GARCIER JM., MOFID R., RAVEL A., BOYER L. Intrapancreatic lipoma : a rare, easily diagnosed tumor. *Presse Med.*, 2002, **23** : 317.
20. KANEMOTO A., TOYAMA N., NODA H., KONISHI F. A case of pancreatic lipoma : CT examination. *Nippon Shokakibyo Gakkai Zasshi*, 2007, **104** : 1387-91.
21. SATO K., TAKAGI H., ISHIBASHI A., KOYAMA Y., MORI M. Small pancreatic lipoma : case report and literature review. *Hepatogastroenterology*, 2007, **54** : 1582-4.
22. REBORDOSA S., ESTEBA M.D., ROMERO I. Imaging case number 1. – Pancreatic lipoma. *Radiologia*, 2005, **47** : 252+296.
23. SÁNCHEZ-ALONSO L., MECA J., CANTERO G., RODRÍGUEZ-MONDÉJAR R. Pancreatic lipoma. Case report and review of the literature. *Radiologia*, 2005, **47** : 207-9.
24. XU G.Q., WU Y.Q., WANG L.J., CHEN H.T. Values of endoscopic ultrasonography for diagnosis and treatment of duodenal protruding lesions. *J. Zhejiang Univ. Sci. B.*, 2008, **9** : 329-34.
25. KATZ D.S., HINES J., MATH K.R., NARDI P.M., MINDELZUN R.E., LANE M.J. Using CT to reveal fat containing abnormalities of the pancreas. *AJR Am. J. Roentgenol.*, 1999, **172** : 393-6.
26. RYAN MF., HAMILTON PA., SMITH AJ., KHALIFA M. Radiologic features of pancreatic lipoma. *Can. Assoc. Radiol. J.*, 2003, **54** : 41-4.
27. SCHWARZBACH M.H., DIMITRAKOPOULOU-STRAUSS A., WILLEKE F., HINZ U., STRAUSS L.G., ZHANG Y.M., MECHTERSHEIMER G., ATTIGAH N., LEHNERT T., HERFARTH C. Clinical value of [18-F] fluorodeoxyglucose positron emission tomography imaging in soft tissue sarcomas. *Ann. Surg.*, 2000, **231** : 380-6.
28. FAN C.M., FISCHMAN A.J., KWEK B.H., ABBARA S., AQUINO S.L. Lipomatous hypertrophy of the interatrial septum : increased uptake on FDG PET. *AJR Am. J. Roentgenol.*, 2005, **184** : 339-42.
29. COHADE C., OSMAN M., PANNU H.K., WAHL R.L. Uptake in supraclavicular area fat ("USA-Fat") : description on 18F-FDG PET/CT. *J. Nucl. Med.*, 2003, **44** : 170-6.
30. DI MATTEO F.M., SHIMPI L., PANDOLFI M., RABITTI C., FABIO C., GABBRIELLI A., COSTAMAGNA G. EUS diagnosis of pancreatic lipoma : a case report. *Gastrointest. Endosc.*, 2006, **64** : 146-8.
31. JACOBS J.E., DINSMORE B.J. Mature cystic teratoma of the pancreas. Sonographic and CT findings. *AJR*, 1993, **160** : 523-6.
32. FERNANDEZ-CEBRIAN J.M., CARDA P., MORALES V., GALINDO J. Dermoid cyst of the pancreas : a rare cystic neoplasm. *Hepatogastroenterology*, 1998, **45** : 1874-6.
33. MILANO C., COLOMBATO LA., FLEISCHER I., BOFFI A. Liposarcoma of the pancreas : report of a clinical case and review of the literature. *Acta Gastroenterol. Latinoam*, 1988, **18** : 133-8.
34. ELLIOTT T.E., ALBERTAZZI V.J., DANTO L.A. Pancreatic liposarcoma. *Cancer*, 1980, **45** : 1720-3.
35. AMANO H., HARIMA K., AIBE T., NAGATOMI Y., KAWASHIMA M., MAETANI N., AZUMA M., ARIYAMA S., FUJI T., KAWAMURA S., TAKEMOTO T. A case of pancreatic liposarcoma. *Nippon Shokakibyo Gakkai Zasshi*, 1981, **78** : 1475-9.
36. CHOUX R., ANDRAC L., RODRIGUEZ M., MASSELOT R., HASSOUN J. Liposarcoma of the pancreas. Study of a case including ultrastructure. *Ann. Anat. Pathol. (Paris)*, 1979, **24** : 251-9.
37. AKATSU T., TSUGITA M., RO S., KAMEYAMA K., KITAJIMA M. Primary malignant fibrous histiocytoma of the pancreas : a case with K-ras mutation and review of the literature. *Dig. Dis. Sci.*, 2005, **50** : 2214-7.
38. YU R.S., WANG J.W., CHEN Y., DING W.H., XU X.F., CHEN L.R. A case of primary malignant fibrou histiocytoma of the pancreas : CT and MRI findings. *World J. Gastroenterol.*, 2008, **14** : 2942-5.
39. AIHARA H., KAWAMURA Y., TOYAMA N., MORI Y., KONISHI F., YAMADA S. A small leiomyosarcoma of the pancreas treated by local excision. *HPB (Oxford)*, 2002, **4** : 145-8.
40. AMIOT A., DOKMAK S., SAUVANET A., VILGRAIN V., BRINGIOER P.P., SCOAZEC J.Y., SASTRE X., RUSZNIEWSKI P., BEDOSSA P., COUVELAND A. Sporadic desmoid tumor. An exceptional cause of cystic pancreatic lesion. *JOP*, 2008, **9** : 339-45.
41. LAZAR C., CHIFAN M., TIRCOVEANU E., COTEA E., FLOREA N., DOBRESCU G. Giant pancreatic fibrolipoma : clinical and therapeutic considerations. *Rev. Med. Chir. Soc. Med. Nat. Iasi*, 1982, **86** : 480-4.