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多层螺旋 CT 在胰腺癌中的诊断价值 *

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摘要 目的：探讨多层螺旋 CT 在胰腺癌中的诊断价值。**方法：**回顾性分析 2017 年 2 月至 2019 年 2 月我院接诊的 72 例经过手术病理证实的胰腺癌患者。比较多排螺旋 CT 平扫、动脉期、胰腺期、门脉期的检出率、神经、血管浸润情况、及选择 55 例正常胰腺组织比较两者多层螺旋 CT 扫描密度值的差异。**结果：**多层螺旋 CT 扫描，平扫、动脉期、胰腺期、门脉期检出率分别为 63.89%、77.78%、95.83%、90.28%，胰腺期、门脉期检出率均显著高于平扫、动脉期（$P<0.05$）；多层螺旋 CT 增强扫描诊断胰腺癌神经浸润的准确性为 80.56%（58/72），敏感性为 91.07%（51/56），特异性为 43.75%（7/16），阳性预测值 85.00%（51/60），阴性预测值 58.33%（7/12）；多层螺旋 CT 增强扫描诊断胰腺癌血管浸润的准确性为 95.83%（69/72），敏感性为 80.00%（8/10），特异性为 98.39%（61/62），阳性预测值 88.89%（8/9），阴性预测值 96.83%（61/63）；胰腺癌组织多层螺旋 CT 扫描密度值均显著高于正常胰腺组织密度值，（$P<0.05$）。**结论：**多排螺旋 CT 在胰腺癌中诊断价值高，可帮助临床提供正确诊断，以选择合适的治疗方案。

关键词：多排螺旋 CT；胰腺癌；诊断价值
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Analysis of the Diagnostic Value of Multislice CT in Pancreatic Cancer*

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ABSTRACT Objective: To study Analysis of the diagnostic value of multislice CT in pancreatic cancer. **Methods:** Retrospective analysis was performed on 72 patients with pancreatic cancer confirmed by surgery and pathology from February 2017 to February 2019 in our hospital. To compare the detection rate, nerve and vascular infiltration, and the density of 55 normal pancreas tissues in multislice spiral CT plain scan, arterial phase, pancreatic phase and portal phase. **Results:** The detection rates of MSCT were 63.89%, 77.78%, 95.83% and 90.28% on plain scan, arterial scan, pancreatic scan and portal scan, respectively, which were significantly higher than those on plain scan and arterial scan ($P<0.05$). The accuracy of MSCT in the diagnosis of pancreatic cancer nerve infiltration was 80.56% (58/72), the sensitivity was 91.07% (51/56), the specificity was 43.75% (7/16), the positive predictive value was 85.00% (51/60), and the negative predictive value was 58.33% (7/12). The accuracy, sensitivity, specificity, positive predictive value and negative predictive value were 95.83% (69/72), 80.00% (8/10), 98.39% (61/62), 88.89% (8/9) and 96.83% (61/63) in the diagnosis of pancreatic cancer vascular infiltration by enhanced multislair CT. The density of pancreatic cancer tissues by MSCT was significantly higher than that of normal pancreas tissues ($P<0.05$). **Conclusion:** Multi-slice spiral CT has high diagnostic value in pancreatic cancer, which can help to provide correct diagnosis and select appropriate treatment.

Key words: Multi-slice spiral CT; Pancreatic cancer; Diagnostic value
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前言

胰腺癌是消化系统常见恶性肿瘤，居恶性肿瘤死亡原因的第四位，是预后最差的恶性肿瘤之一，本病男性发病率高于女性，但绝经后妇女的发病率与男性相仿[1,2]。近年来，其发病率在全球范围内呈上升趋势。胰腺癌临床表现取决于癌的部位、有无转移等情况，虽然有自觉痛，但并不是所有病人都有压痛，位置隐秘，往往被消化道组织器官遮盖，临床症状不明显，病情发展快，导致胰腺癌的诊断延误，因此岁胰腺癌患者早期诊断、准确分期，有利于早期发现胰腺癌的病变[3-5]。CT 是目前诊断胰腺癌的主要手段之一，能准确判断癌肿周围主要血管受侵程度，为临床术前评估提供客观依据[6]。多层螺旋 CT 是 1997 年研制

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出来的，扫描覆盖范围大，扫描时间短，Z 轴分辨率高，具有多排宽探测器结构、球管一次曝光，且同时获得多个层面，已被应用于人体三维成像、血管造影成像、脑灌注成像像等领域[7,8]。为进一步提高胰腺癌的诊断效果，本研究旨在研究多层螺旋 CT 在胰腺癌中的诊断价值，现报道如下。

1 资料与方法

1.1 一般资料

顾性分析 2017 年 2 月至 2019 年 2 月我院接诊的 72 例经过手术病理证实的胰腺癌患者作为本次研究对象。男 39 例，女 32 例，年龄 29~69 岁，平均(49.65± 5.32)岁，其中胰腺癌类型：胰头癌 28 例、胰体癌 19 例、钩突癌 12 例、胰尾癌 13 例；肿瘤分期：T1 期 23 例、T2 期 28 例、T3 期 21 例。选取同期正常胰腺组织 55 例，其中男 39 例，女 26 例，年龄 25~68 岁，平均(49.51± 5.19)岁。两组基线资料无明显差异，可比较。

参照《胰腺癌综合诊治中国专家共识》[9]，(1)伴有上腹部不适、隐痛、消化不良或腹泻等症状；(2)不同方式的上腹部或腰背部疼痛等症状；不明原因的消瘦、体重减轻；病理检查证实。

纳入标准：(1)符合上述诊断标准；(2)预计生存期＞3 月；(3)病灶旁淋巴结未见肿大；(4)患者知情签署知情同意书。排除标准：(1)合并严重脏器疾病；(2)呼吸、血液感染疾病者；(3)肿瘤远处转移者；(4)失语、精神异常者；(5)拒绝治疗，中途退出研究者；(6)妊娠、围产、哺乳期妇女的患者；(7)严重脑血管疾病。

1.2 方法

多排螺旋 CT：使用 Philip128 排螺旋 CT 机，患者检查前饮水 500 mL，保持仰卧位，一次性屏住呼吸，确定胰腺和胰周大血管的上下限范围，CT 平扫，在扫描前没有服用对比剂，层面厚度为 2.5~5.0 mm，螺距控制在 1 或者 1.375，200 mA，120 kV。可进行 1.25 mm 重建。检测结果需由资历丰富的医师阅片，并测量各项数据，例如瘤密度、体积、位置、是否累及胰腺周围血管、是否发生淋巴结转移、神经、血管浸润等。

1.3 观察指标

神经浸润标准：胰周腹膜后脂肪间隙消失、脾丛脉后脂肪组织变窄或消失。静脉受侵标准：肿瘤包绕静脉超过管周 50%，管壁浸润、管腔狭窄及闭塞。胰腺癌侵犯胰周动脉标准：肿瘤包绕动脉超过管周 50%，其中胰腺癌组织与正常胰腺组织的密度相比，分为等密度、低密度或高密度；以低密度或高密度判断为阳性。

1.4 统计学分析

以 spss18.0 软件包处理，符合正态分布计量资料用均数± 标准差($\bar{x}\pm s$)表示，组间比较使用独立样本 t 检验，计数资料以率表示，x^2 检验，$P<0.05$ 表示差异具有统计学意义。

2 结果

2.1 多层螺旋 CT 在胰腺癌中的检出率

多层螺旋 CT 扫描，平扫、动脉期、胰腺期、门脉期检出率分别为 63.89%、77.78%、95.83%、90.28%，胰腺期、门脉期检出率均显著高于平扫、动脉期($P<0.05$)，见表 1。

表 1 多层螺旋 CT 在胰腺癌中的检出率[n(%)]

Table 1 Detection rate of MSCT in pancreatic cancer[n(%)]

By stages	Positive	Negative	Detection rate
Flat sweep	46	26	63.89
Arterial phase	56	16	77.78
Pancreatic stage	69	3	95.83*
Portal period	65	7	90.28#

Note: Compared with plain scan and arterial phase, *P<0.05, 2 value was 22.841, 10.247, respectively;

The values of #P<0.05 x^2 were respectively14.192, 4.191.

2.2 多层螺旋 CT 诊断胰腺癌神经浸润情况

多层螺旋 CT 增强扫描诊断胰腺癌神经浸润的准确性为 80.56%(58/72)，敏感性为 91.07%(51/56)，特异性为 43.75%(7/16)，阳性预测值 85.00%(51/60)，阴性预测值 58.33%(7/12)。见表 2。

表 2 多层螺旋 CT 诊断胰腺癌神经浸润情况[n(%)]

Table 2 Multi slice spiral CT diagnosis of pancreatic cancer with nerve infiltration[n(%)]

Multislice spiral CT	Pathological examination		Total
	Infiltration	No infiltration	
Infiltration	51	9	60(83.33)
No infiltration	5	7	12(16.67)
Total	56	16	72

2.3 多层螺旋 CT 诊断胰腺癌血管浸润情况

多层螺旋 CT 增强扫描诊断胰腺癌血管浸润的准确性为 95.83%(69/72)，敏感性为 80.00%(8/10)，特异性为 98.39%(61/62)，阳性预测值 88.89%(8/9)，阴性预测值 96.83%(61/63)。见表 3。

表 3 多层螺旋 CT 诊断胰腺癌血管浸润情况[n(%)]

Table 3 Multi slice spiral CT diagnosis of pancreatic cancer vascular infiltration[n(%)]

Multislice spiral CT	Pathological examination		Total
	Infiltration	No infiltration	
Infiltration	8	1	9(12.50)
No infiltration	2	61	63(87.50)
Total	10	62	72

2.4 多层螺旋 CT 扫描胰腺癌组织和正常胰腺组织的密度比较

胰腺癌组织多层螺旋 CT 扫描密度值均显著高于正常胰腺组织密度值($P<0.05$),见表 4。

表 4 多层螺旋 CT 扫描胰腺癌组织和正常胰腺组织的密度比较($\bar{x}\pm s$)

Table 4 Density comparison of pancreatic cancer tissue and normal pancreatic tissue by multi-slice spiral CT($\bar{x}\pm s$)

Category	n	Flat sweep	Arterial phase	Pancreatic stage	Portal period
Pancreatic cancer tissue	72	36.21± 3.38	59.87± 4.56	92.87± 6.85	74.81± 6.24
Normal pancreatic tissue	55	30.15± 4.17	35.84± 3.21	48.71± 7.23	42.35± 3.64
t value		9.044	33.316	35.127	34.410
P value		0.000	0.000	0.000	0.000

3 讨论

胰腺癌是一种恶性程度较高的肿瘤，临床表现为黄疸、纳差、腹痛等症状,仅观察临床症状难以与其他消化道疾病区分,容易漏诊,其发病率较高,据调查显示,2016 年全美胰腺癌死亡病例为 41780 例，其中 90%确诊患者发生转移,5 年生存率仅为 8%,死亡排名恶性肿瘤第 4 位[10,11]。因此早期发现诊断胰腺癌对患者的预后十分重要。

影像学是诊断胰腺癌的重要手段,其中超声具有成本低、无创等特点,但胰腺解剖位置较深,受前方肠气影响,诊断较难[12-16]。多层螺旋 CT 具有空间分辨率高、扫描速度快等特点,弥补了超声诊断的不足,常规平扫能了解胰腺病灶形态、大小等,在增强扫描的同时能清晰显示肿瘤结构,对胰腺相关淋巴结转移及血管浸润有一定优势[17-20]。胰腺是血供较为丰富的器官,由于肿瘤引起局部组织纤维化，肿瘤邻近的小动脉新生内膜增生,导致血管硬化,引起血流减慢,而多层螺旋 CT 可实现在胰腺实质及胰腺邻近血管达到强化最大值时进行数据采集[21-23]。有研究显示，多层螺旋 CT 是分析组织器官血流动力学的有效方法,可分析胰腺癌组织与正常胰腺组织的血流动力学,为诊断胰腺癌提供依据[24,25]。本研究中将 72 名胰腺癌患者均采用多层螺旋 CT 扫描,其中平扫、动脉期、胰腺期、门脉期检出率分别为 63.89%、77.78%、95.83%、90.28%,且胰腺期、门脉期检出率均显著高于平扫、动脉期,结果提示,对胰腺癌患者进行多层螺旋 CT 多期增强扫描可提高胰腺癌病灶的检出率,为早期诊断胰腺癌提供依据。Abbruzzese J L[26]等研究也显示,在多层螺旋 CT 多期增强扫描胰腺癌中,胰腺期的检出率最显著,而动脉期与门脉期扫描对于判断癌细胞侵袭周围血管较为准确。分析其原因可能是因为多层螺旋 CT 检测主要分为动脉期、胰腺期及肝脏期三期,正常胰腺具有较为丰富的血供,而胰腺癌属于血供肿瘤,多期扫描检测可更好的显示胰腺病变情况,显示肿物与周围血管及器官的关系。

有研究显示,胰腺癌侵犯周围血管,导致管腔狭窄,产生血流动力学改变,因此检测胰腺癌患者神经浸润及血管浸润情况具有重要意义[27-31]。胰腺癌围管性浸润,可扩张患者胰胆管及胰管周围实质萎缩并强化峰值延迟，远端胰腺强化峰值延迟,是由于远端胰管受阻周围胰腺慢性炎症及邻近肿瘤的小动脉血管内膜增生、硬化[32-34]。本研究结果显示,多层螺旋 CT 增强扫描诊断胰腺癌神经浸润的准确性为 80.56%,敏感性为 91.07%,特异性为 43.75%,阳性预测值 85.00%,阴性预测值 58.33%,诊断胰腺癌血管浸润的准确性为 95.83%,敏感性为 80.00%,特异性为 98.39%,阳性预测值 88.89%,阴性预测值 96.83%。结果提示,多层螺旋 CT 增强扫描检测诊断神经浸润及血管浸润具有较高的诊断价值。分析其原因可能是因为血管浸润时将产生小属支静脉扩张,多层螺旋 CT 检测可清晰显示胰周小静扩张情况,可行多平面容积重建,有助于清晰显示肿瘤与邻近血管的关系,提高诊断血管浸润的效果。本研究结果还显示,胰腺癌组织多层螺旋 CT 扫描密度值均显著高于正常胰腺组织密度值,结果提示,在胰腺癌的多层螺旋 CT 扫描中,通过对比胰腺期胰腺癌组织与正常胰腺组织的密度值,可进一步提高对胰腺癌的诊断效果。Jiang Z[35]等研究也显示,胰腺癌组织表面通透性的检测值小于正常胰腺组织,与胰腺癌的病情严重程度密切相关。

综上所述,多排螺旋 CT 检测胰腺癌血管浸润、神经浸润具有重要的临床应用意义,在胰腺癌中诊断价值高,可帮助临床提供正确诊断,以选择合适的治疗方案。

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