

## 儿童胰腺实性假乳头状瘤多排螺旋CT表现

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**【摘要】目的:**探讨儿童胰腺实性假乳头状瘤(SPTP)的多排螺旋CT(MDCT)表现。**方法:**回顾性分析经手术病理证实为SPTP的10例患儿临床及MDCT资料,分析总结其特征表现。**结果:**10例患儿均为女性,SPTP均为单发病灶,位于胰腺头颈部3例,胰腺体尾部7例。肿瘤最大径为2.5~13.8 cm,平均值为5.94 cm。8例呈类圆形,2例呈分叶状。10例均边界清晰,8例有完整包膜。平扫1例肿瘤呈均匀低密度,增强无明显强化;其余9例呈囊实性,8例以实性为主,1例囊实性比例相当,其中1例可见包膜下弧形钙化,实性成分动脉期呈轻度强化,强化程度低于正常胰腺组织,门脉期呈渐进性不均匀强化,囊性成分无强化。1例肿瘤出现肝内胆管和主胰管轻度扩张,1例出现主胰管轻度扩张。所有肿瘤均未见肝脏及淋巴结转移。**结论:**儿童SPTP好发于女性,其CT表现具有一定的特征性,对诊断和鉴别诊断具有一定意义。

**【关键词】**实性假乳头状瘤;胰腺;儿童;计算机X线体层摄影术

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## Multidetector computed tomography features of solid pseudopapillary tumor of pancreas in children

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**Abstract: Objective** To investigate multidetector computed tomography (MDCT) features of solid pseudopapillary tumor of the pancreas (SPTP) in pediatric patients. **Methods** Clinical data and MDCT findings of 10 pediatric patients with SPTP confirmed by surgery and pathology were retrospectively reviewed, and then the MDCT features were summarized. **Results** All the patients were female, and all the cases were of single lesion. Among the tumors, 3 located at the pancreatic head and neck, and the other 7 at the pancreatic body and tail. The maximum diameters of tumors were 2.5-13.8 cm, with an average of 5.94 cm. Eight tumors were round-like and 2 were lobulated. All tumors were well-circumscribed and 8 tumors had complete capsules. On CT images, 1 tumor showed homogeneous low density without enhancement, and the other 9 tumors consisted of solid and cystic component, with 8 cases containing mostly solid components and 1 case containing similar proportion of solid and cystic components. Subcapsular calcification was only found in 1 case. After contrast-enhanced scan, the solid components presented slight enhancement in the arterial phase, with an enhancement lower than normal pancreas, and progressive heterogeneous enhancement in the portal venous phase. The cystic components showed no enhancement. Mild dilatation was observed at bile duct and pancreatic duct in 1 case, and only pancreatic duct dilatation was found in another case. No patients developed liver or lymph nodes metastasis. **Conclusion** Pediatric SPTP often occurs in female patients. The characteristic CT features of SPTP play an important role in the diagnosis and differential diagnosis.

**Keywords:** solid pseudopapillary tumors; pancreas; children; X-ray computed tomography

### 前言

胰腺实性假乳头状瘤(Solid Pseudopapillary

Tumors of the Pancreas, SPTP)是一种少见的胰腺肿瘤,占胰腺所有肿瘤的1%~3%<sup>[1]</sup>。近年来,随着对SPTP认识的不断增加,其诊断准确率已达到60%以上<sup>[2]</sup>。SPTP好发于年轻女性,目前已有较多有关成人SPTP影像特征的文献报道<sup>[1,3-7]</sup>,而有关于儿童SPTP的研究报道较少。在临床工作中,儿童SPTP的正确诊断对于术前治疗方案的选择具有重要意义。本文旨在探讨儿童SPTP的多排螺旋CT

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(Multidetector Computed Tomography, MDCT)表现,以提高诊断准确率。

1 资料与方法

1.1 临床资料

回顾性分析上海交通大学医学院附属新华医院2012年1月~2017年8月期间,经手术病理证实的SPTP共10例,均为女性,年龄7~15岁,中位年龄为9.5岁。7例因上腹部不适就诊,其余3例为体检偶然发现(表1)。肿瘤指标CA199、CA125、CEA均无异常升高。

表1 10例儿童SPTP的临床资料  
Tab.1 Clinical information of 10 pediatric patients with SPTP

No. of patients	Gender	Age/years	Clinical presentation	Location	Tumor size/cm	Preoperative diagnosis	Type of resection
1	Female	7	Left upper abdominal discomfort	Pancreatic tail	5.1×5.3×5.0	Pancreatoblastoma	Distal pancreatectomy
2	Female	7	Upper abdominal discomfort	Pancreatic head	5.3×5.7×4.4	SPTP	Pancreatoduodenectomy
3	Female	8	Upper abdominal discomfort	Pancreatic head	4.3×4.2×3.9	Benign tumor of pancreas	Pancreatoduodenectomy
4	Female	8	Detected through physical examination	Pancreatic tail	3.2×3.3×2.8	SPTP	Laparoscopic distal pancreatectomy
5	Female	9	Upper abdominal discomfort	Pancreatic body	2.3×2.8×2.6	Pancreatoblastoma	Laparoscopic resection of pancreatic tumor
6	Female	10	Middle and upper abdominal discomfort	Pancreatic tail	2.1×2.4×2.5	SPTP	Distal pancreatectomy
7	Female	10	Abdominal discomfort	Pancreatic tail	5.6×6.2×6.0	SPTP	Pancreatic tumor resection with pancreatic jejunostomy
8	Female	12	Detected through physical examination	Pancreatic neck	5.5×5.0×5.1	SPTP	Laparoscopic resection of pancreatic tumor
9	Female	15	Left upper abdominal discomfort	Pancreatic tail	7.1×8.2×10.0	Retroperitoneal tumor	Distal pancreatectomy combined with splenectomy and left adrenalectomy
10	Female	15	Detected through physical examination	Pancreatic tail	7.8×9.1×13.8	SPTP	Distal pancreatectomy

SPTP: Solid pseudopapillary tumors of the pancreas

1.2 MDCT 检查方法

所有10例患者均行MDCT平扫及双期增强扫描。MDCT采用Siemens Somatom Definition 双源64层螺旋CT机。扫描范围为膈顶至盆腔入口水平。扫描参数:管电压120 kV,管电流平扫为80 mA,增强为100 mA;层厚5 mm,层间距5 mm。增强扫描使用高压注射器以2.0 mL/s的流率经肘前静脉团注非离子型对比剂欧乃派克(300 mgI/mL),剂量为2 mL/kg。动脉期扫描采用腹主动脉内CT值监测触发方式,当达到监测阈值100 HU时开始动脉期扫描,门脉期扫描为造影剂注射后70 s进行。

1.3 图像分析

由两名分别具有5年和8年腹部影像诊断经验的放射科医师对病变的MDCT征象进行观察分析,包括病灶的部位、大小、形态、边缘、边界、内部密度

(有无囊变、钙化)、强化程度及方式、包膜、胰管及胆道有无扩张、胰腺实质有无萎缩、与毗邻组织器官及大血管的关系、有无转移等。

1.4 病理学检查

所有组织标本均经石蜡包埋后行HE和免疫组织化学染色,观察孕激素受体PR、vimentin、CD10、α1-AT、syn等指标阳性表达情况。

2 结果

2.1 CT表现

10例SPTP均为单发病灶,位于胰头2例、胰颈部1例、胰体1例、胰尾6例。肿瘤最大径2.5~13.8 cm,平均直径5.94 cm。10例肿瘤边界清晰,其中8例可见完整包膜。8例呈类圆形,2例呈分叶状。

10例病灶中,1例平扫呈均匀稍低密度,CT为

36 HU,增强无明显强化(图 1a~e)。其余9例呈囊实性,其中8例以实性成分为主,1例囊实性成分相当(图 1f~h),1例肿瘤包膜下见弧形钙化(图 1i);9例肿瘤中实性成分平扫呈等密度,CT值为29~39 HU,平均CT值为35 HU,增强呈持续性强化,动脉期CT值

为43~71 HU,平均CT值为54 HU,门脉期CT值为60~91 HU,平均CT值为75 HU。囊性成分无强化,8例包膜呈持续性强化(图 1j~l)。

10例SPTP均无胰腺实质萎缩,1例胰头SPTP出现肝内胆管和主胰管轻度扩张,1例出现主胰管轻度

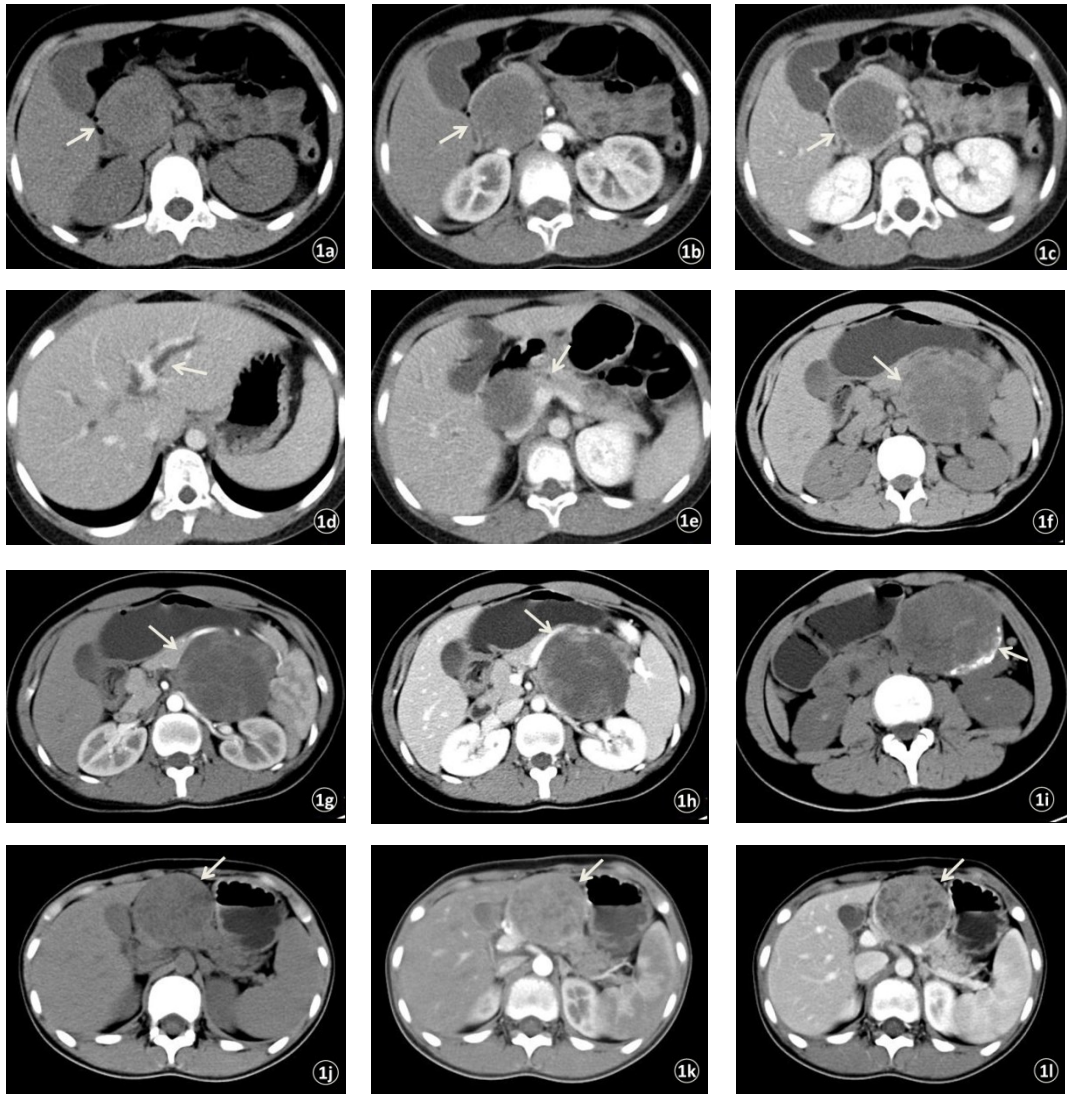


图1 SPTP患者CT表现

Fig.1 CT features of SPTP in patients

Images a-e were from an 8-year-old female with SPTP in pancreatic head. The plain axial CT image showed a slightly high-density mass (a). Axial post-contrast CT image showed no obvious enhancement in the arterial phase (b) and portal vein phase (c), indicating necrosis within the tumor. The intrahepatic bile duct (d, arrow) and the main pancreatic duct (e, arrow) demonstrated mild dilatation due to the tumor compression. Images f-h were from a 15-year-old female with SPTP in pancreatic tail. The plain axial CT image showed a solid and cystic mass (f). Axial post-contrast CT image showed progressive enhancement with "floating cloud" sign in the arterial phase (g) and portal vein phase (h). Image i was from another 15-year-old female with SPTP in pancreatic tail. The plain axial CT image demonstrated subcapsular calcification of the tumor. Images j-l were from a 12-year-old female with SPTP in pancreatic neck. The plain axial CT image showed a solid-component-predominant solid-cystic mass with well-defined margin (j). Axial post-contrast CT image showed progressive enhancement of the solid component in the arterial phase (k) and portal vein phase (l). The capsule showed delayed enhancement (l, arrow).

扩张。1例脾静脉未见显示,1例脾动静脉受压向前推移,其余8例脾动静脉无明显异常。1例脾门及左例肾上腺分界不清。所有病例均无肝脏及腹腔和腹

膜后淋巴结转移。

2.2 手术及病理表现

所有患者均行手术完整切除肿瘤,6例行胰腺肿



瘤切除术、2例行胰十二指肠切除术、1例行胰尾肿瘤切除术+脾脏+左侧肾上腺切除术、1例行胰腺肿瘤切除术和胰-空肠吻合术。术中8例可见包膜,1例脾门及左侧肾上腺受侵。肿瘤质地较硬,边界清晰。

肿瘤大体表现为类圆形或分叶状,切面呈灰红、灰白色、暗红色,1例CT增强扫描肿瘤无强化的病例切面呈均匀暗红色,提示出血,其余均呈囊实性,比例不一。镜下见肿瘤细胞无异型性或轻度异型性,多数肿瘤细胞呈实性或围绕血管呈乳头样等结构排列,肿瘤细胞呈圆形或卵圆形,胞浆较丰富,胞浆嗜酸性或空泡状,间质部分区域粘液变、部分区域玻璃样变及出血坏死。

免疫组织化学染色结果显示10例SPTP肿瘤PR、vimentin表达均为阳性,9例CD10、 $\alpha$ 1-AT表达阳性,3例syn表达阳性。

### 3 讨论

#### 3.1 临床特点

SPTP是一种罕见的低度恶性的胰腺肿瘤,由Frantz于1959年首次报道,曾命名为Frantz瘤、乳头状囊性瘤及胰腺实性囊状肿瘤等,1996年世界卫生组织(World Health Organization, WHO)重新命名为胰腺实性假乳头状瘤<sup>[8]</sup>。SPTP好发于年轻女性,20~30岁为发病高峰年龄段。文献报道90%以上SPTP发生于女性,80%患者年龄为20~30岁;儿童SPTP占所有SPTP的8.0%~16.6%,女性多见<sup>[8-9]</sup>。本组患者均为女性,发病年龄为7~15岁,其中10岁以下占80%,与以往文献报道基本相符<sup>[8-12]</sup>,以往文献亦报道少数见于男性儿童SPTP,因本研究病例较少,无男性儿童SPTP病例。

SPTP的发病机制尚未明确,目前多数认为SPTP起源于多潜能干细胞,如CD10、 $\alpha$ 1-AT、vimentin、syn阳性表达,可支持SPTP的多潜能干细胞起源学说<sup>[8]</sup>。Lima等<sup>[13]</sup>报道SPTP的免疫组化中,PR、vimentin、NSE和 $\alpha$ 1-AT指标多数为阳性,对肿瘤的生长起着重要的作用,但其病因尚不清楚。本组病例中,PR、vimentin表达均为阳性,9例CD10、 $\alpha$ 1-AT表达阳性,而仅3例syn表达阳性。因此,PR、vimentin、CD10、 $\alpha$ 1-AT表达阳性有助于SPTP的诊断。SPTP患者临床症状无特异性,多以腹部疼痛不适或体检发现。本研究中,8例因上腹部不适就诊,2例为体检偶然发现,与以往文献报道相符<sup>[12]</sup>。

#### 3.2 CT表现

SPTP可发生于胰腺任何部位,以胰体尾部多见,多为单发肿块,一般呈圆形或类圆形,边界清晰,可

见完整包膜。本组病例均为单发肿块,8例为圆形或类圆形,体积较大者2例呈分叶状,7例位于胰体尾部,边界清晰,8例可见完整包膜,与诸建明等<sup>[14]</sup>报道一致,而薛潋滢等<sup>[8]</sup>报道的6例SPTP中仅1例显示包膜,但6例边界均清晰。

SPTP肿瘤内部多呈囊实性,内部可见出血、钙化。文献报道约30% SPTP内可出现钙化,钙化灶多位于肿瘤边缘或包膜<sup>[15]</sup>。本研究中SPTP的钙化出现率低于30%,仅1例出现包膜下钙化。于彤等<sup>[12]</sup>研究报道的钙化发生率为15%,而薛潋滢等<sup>[8]</sup>报道的6例SPTP中均未见钙化。由此可见,SPTP中钙化的出现并非SPTP的特征性表现。本组病例中1例CT呈均匀低密度者手术后大体标本切面呈暗红色,提示肿瘤内部出血改变。儿童SPTP的CT表现与肿瘤内部囊性成分与实性成分比例和分布相关,实性成分增强动脉期呈轻度强化,强化程度低于胰腺正常组织,门脉期呈持续性强化,与成人SPTP的CT表现类似<sup>[16]</sup>。CT增强扫描后出现的“浮云征”亦是儿童SPTP的典型征象,薛潋滢等<sup>[8]</sup>报道“浮云征”形成的病理基础为由肿瘤不同比例的实性区、假乳头区及两者的过渡区混合而成的实性组织排列呈絮状或片状。

当SPTP内由囊性和实性成分组成、实性成分持续性强化、伴有“浮云征”征象时,SPTP较容易诊断。本组病例中,1例出现典型的上述征象,多数表现为以实性为主的肿块,伴有散在小囊变区,此类肿瘤的最大径多数小于5 cm,其实性成分的持续性强化以及完整的包膜有助于临床诊断。因此,笔者推测儿童的SPTP中直径小于5 cm的SPTP可多数表现为以实性为主的囊实性肿瘤,今后需扩大样本量进一步证实。

SPTP为低度恶性肿瘤,约10%~15%病例出现局部浸润和远处转移,最常转移至肝脏和网膜<sup>[17-18]</sup>。但局部浸润和远处转移并非手术的禁忌症,伴有远处转移的患者手术切除肿瘤后仍预后良好<sup>[1]</sup>。如能术前正确诊断,应采取手术治疗。本组病例中,1例脾静脉受侵,1例与脾门、左侧肾上腺分界不清,均行手术根治治疗。SPTP多数不引起胆管和主胰管的扩张。本研究中,1例胰头部SPTP出现肝内胆管、主胰管轻度扩张,1例出现主胰管轻度扩张,均因肿瘤压迫导致的继发性轻度扩张,均未见胆道和胰管的明显受侵。

#### 3.3 鉴别诊断

儿童SPTP主要需与胰母细胞瘤、胰腺假性囊肿等鉴别:①胰母细胞瘤通常表现为巨大肿块,形态呈

椭圆形或分叶状,常跨中线生长,内部常伴大片状坏死,可见钙化灶,CT增强呈轻度持续性强化,容易出现肿块周围或腹膜后淋巴结肿大。肿瘤指标NSE、AFP可升高<sup>[19]</sup>。②胰腺假性囊肿常有急慢性胰腺炎或手术病史,CT多表现为单囊性或多房囊性肿块,边界清晰,囊壁较厚,增强囊壁可轻度强化,内部均匀低密度积液无明显强化<sup>[20]</sup>。当假性囊肿伴出血、感染时与SPTP较难鉴别,此时临床病史有助于鉴别诊断。

总之,儿童SPTP的典型CT表现为具有完整包膜的囊实性肿块、伴有出血和“浮云征”征象、增强实性成分呈渐进性强化。当女性患儿胰腺肿瘤表现为以实性成分为主、伴有小囊变和完整包膜、增强实性成分呈渐进性强化时,亦需首先考虑SPTP。

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