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肝移植术后肝脏淋巴回流淤滞的影像学特征

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摘要 目的:分析肝移植术后病人肝脏淋巴回流淤滞(intrahepatic lymphatic stasis, IHLS)的计算机断层扫描(Computed Tomography, CT)及磁共振(Magnetic Resonance Imaging, MRI)影像学特征。**方法:**回顾性收集我院自 2004~2012 年肝移植术后病人 66 例,分析其术后 CT 及 MRI 图像,对 IHLS 的阳性次数、持续时间及其影像学特征进行观察分析。**结果:**66 病人中 IHLS 病人 22 例。肝移植术后 IHLS 的直接征象为血管周围项圈征(perivascular collar, PC),CT 和 MRI 可清晰显示且可根据 PC 的部位分型。**结论:**肝移植术后 IHLS 的 CT 及 MRI 具有特定的影像学特征,对其识别具有一定的临床意义。

关键词:肝脏;淋巴淤滞;计算机断层摄影术;核磁共振成像

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Image Characteristics of Intrahepatic Lymphatic Stasis in Patients after Liver Transplantation

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ABSTRACT Objective: To study computed tomography (CT) and magnetic resonance imaging (MRI) characteristics of intrahepatic lymphatic stasis (IHLS) in patients after liver transplantation. **Methods:** 66 patients with liver transplantation whom performed CT and/or MRI scanning collected retrospectively in our hospital from 2004 to 2012 year. Then number, duration, of IHLS, CT and MRI characteristics of IHLS were analyzed after review the CT and MRI data. **Results:** Of 66 cases with liver transplantation, there was 22 cases with IHLS which displayed called direct sign called perivascular collar (PC) after operation. CT and MRI modality can not only show the IHLS clearly but also apply to classification of IHLS according the site of PC. **Conclusions:** IHLS after liver transplantation has its CT and MRI characteristics and to read it rightly has clinical significance to some extent.

Key words: Liver; Lymphatic Stasis; Computed tomography (CT); Magnetic Resonance Imaging (MRI)

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前言

肝内淋巴淤滞(intrahepatic lymphatic stasis, IHLS)包括肝内淋巴管扩张和肝血管周围浸润性淋巴水肿^[1],许多疾病可以导致诸如 IHLS 等肝脏淋巴动力学的异常改变。目前,肝脏移植术已经成为急慢性终末期肝脏疾病的主要有效治疗手段之一^[2-5]。在肝移植术后及部分肝病病人,近年来我们注意到 CT 上肝内门静脉(汇管区)或其分支周围及下腔静脉肝内段周围有低密度影即血管周围透亮影(perivascular lucencies, PVLs),在 MRI 图像上,其表现为肝内门静脉(汇管区)或其分支周围及下腔静脉肝内段周围环状或条带状异常信号(perivascular abnormal intensity, PVAI)^[6],其作为反应肝脏淋巴动力学异常(IHLS)的指标已被逐渐肯定^[7]。然而,对于 IHLS 的影像学规范化识别及普及尚需进一步提高。总结及分析 IHLS 的影像学特征对于早期识别 IHLS 进而改善肝移植预后具有较为重要的意义。因此,本文回顾性分析了我院自 2004~2012 年肝移植术后

66 例病人的影像学特征及临床资料,为临床对此征象的认识及进一步研究提供依据。

1 临床资料和方法

1.1 病人资料

收集我院自 2004-2012 年肝移植术后行 CT 或者 MRI 检查的病人 66 例,年龄 24-65 岁,平均年龄 42 岁。46 例男性,20 例女性。CT 检查采用 16 排探测器螺旋 CT 机(Philips Bril-liance 16),上腹部增强扫描,对比剂为欧乃派克。MRI 检查采用 3.0 T 磁共振扫描仪(GE,USA),使用体线圈,上腹部扫描,对比剂为马根维显(GD-DTPA)。

1.2 临床资料分析

将病例按照并发症分类,每类为一组,其中术后未发生并发症的正常患者为正常移植肝组,其他分别按照术后并发症一分组。记录每组术后行 CT 及 MRI 检查的次数、IHLS 阳性的次数及术后持续时间。

1.3 图像分析

由两名以上有经验的放射科医师对图像进行分析,最终达成一致意见。IHLS 诊断参考文献^[8],依据 CT 和 MRI 图像血管周围含水量增多表现称作血管周围项圈征(perivascular collar,

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PC)作为主要依据:① CT:门静脉分支和/或肝内下腔静脉周围低密度环或条状影,类似水密度(PVLs);② MRI:门静脉分支和/或肝内下腔静脉周围环形或条状异常信号影,T1WI上稍低信号,T2WI上稍高信号(PVAI)。然后根据PC的部位对本组IHLS进行分型:① 门脉型:门静脉主干或者大分支周围;② 腔静脉型:肝内下腔静脉周围;③ 周围型:肝周围或者肿瘤病灶

旁小血管周围;④ 混合型:同时出现以上两种或者三种类型。

2 结果

2.1 肝移植术后IHLS的阳性次数及持续时间

本组病人基本资料见表1,肝移植术后经CT或MRI诊断IHLS阳性22例,IHLS阳性次数及持续时间见表1。

表1 66病人基本情况和IHLS阳性次数、持续时间

Table 1 The basic information of 66 cases and the number of IHLS and duration day

组别 Group	病例 Case	CT 检查次数 / 阳性次数 No. of CT exam / positive No.	MRI 检查次数 / 阳性次数 No. of MRI exam / positive No.	肝移植术后LS持续时间(天) Duration time of LS after liver transplantation(d)					LS持续确切天数 Exact duration time of LS after liver transplantation(d)
				<60	60~120	120~180	180~360	>360	
正常移植肝 Normal liver transplantation	15	24/5	1/1	2	2	1	1	0	25,45,78,104, 157,274,
肝癌复发 Relapse of HCC	17	44/12	3/0	2	3	0	4	3	15,43,90,104,120,190,192,253,285,376,403,2005
移植排斥 Transplant rejection	6	10/5	1/1	2	0	3	0	1	35,55,128,152,159,560
胆道并发症 biliary complications	11	35/22	1/0	2	3	4	1	13	42,96,104,113,128,133,168,152,230,395,410,432,441,462,470,498,505,549,564,582,1142,1160
静脉并发症 venous complications	12	31/23	0/0	3	2	3	2	13	35,43,55,67,104,159,140,160,249,234,432,441,462,470,498,505,549,564,582,2032,2188,2235,2293
动脉并发症 Arterial complications	2	2/0	0/0	0	0	0	0	0	N/A
药物性肝损 Drug-induced liver injury	1	4/0	0/0	0	0	0	0	0	N/A
乙肝复发 hepatitis B recurrence	1	3/3	0/0	2	1	0	0	0	50,60,99
直肠癌伴肝转移瘤 Rectal gland carcinoma with liver metastases	1	7/0	0/0	0	0	0	0	0	N/A
合计 Total	66	160/70	6/2	12	11	11	8	30	

Note: N/A not available

2.2 IHLS的影像特征及分型

本组66例病人中22例上腹部CT出现广泛或者局限门静脉分支周围低密度带,其中6例同时伴有肝内下腔静脉周围低密度带。2例同时出现上腹部MRI门静脉分支周围异常信号影。12例出现门静脉主干或者大分支PVLs,表现为环绕或者两侧条形稍低密度伴随影。密度小于软组织而大于脂肪CT值,近似于液体(图1A)。其中2例同时伴有MRI门静脉主干

或者大分支周围环状或者条带状信号(PVAI)(门脉型,图1B、C)。4例出现肝内下腔静脉周围PVLs,表现为肝内下腔静脉周围环绕或者两侧稍低密度伴随影。密度小于软组织而大于脂肪CT值,近似于液体(腔静脉型,图2)。2例出现肝周围或者肿瘤病灶旁小血管PVLs,表现为环绕或伴行肝周围小血管的低密度影(周围型)。4例同时出现以上两种或者三种类型(混合型,图3)。



图1 男性,58岁,术后并发移植肝排斥。术后CT出现肝静脉大分支周围PVLs(黑色箭头,A);术后第128天随访MRI(B,C)示:T1WI上门静脉大分支两侧轨道样稍低异常信号(黑色箭头,B);T2WI上显示为门静脉大分支两侧轨道样稍高异常信号(白色箭头,C)。

Fig. 1 58-year-old male patient with postoperative graft rejection. Postoperative CT shows PVLs (black arrow, A) around large hepatic vein branches. MRI follow-up at the 128th post-operative day(B,C) showed lower abnormal signal (black arrow, B) on both sides of portal vein's large branches in T1WI image and slightly higher abnormal signal on both sides of the portal vein's large branch (white arrow, C) in T2WI image.

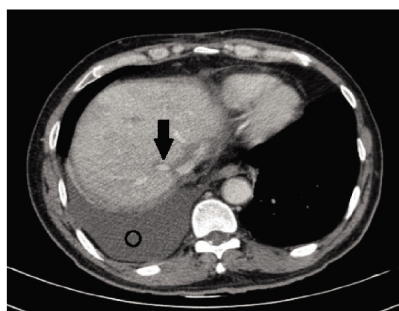


图2 44岁男性,因重症肝炎行原位肝移植手术,术后肝功能异常,肝穿示中度急性排斥反应,术后560天CT示肝静脉周围PVLs(黑色箭头),右侧胸腔积液(黑色圆圈)。

Fig. 2 44-year-old male severe hepatitis patient, liver function became abnormal after orthotopic liver transplantation, liver biopsy shows moderate acute rejection, the post-surgery CT on the 560th day showed PVLs (black arrow) around hepatic vein and pleural effusion (black circle).

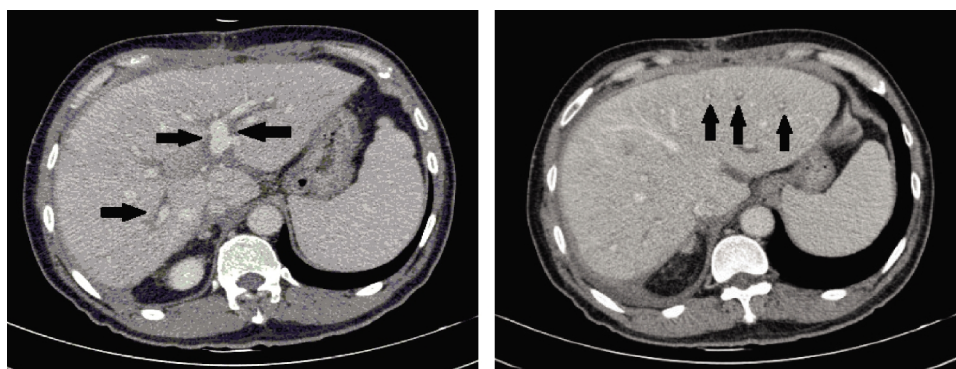


图3 50岁男性,因乙肝后肝硬化行原位肝移植手术后移植肝正常,术后第104天的CT示门静脉大分支周围PVLs(左图黑色箭头)及门静脉周围小分支PVLs(右图黑色箭头)。

Fig. 3 50-year-old male patient with liver cirrhosis, after orthotopic liver transplant, the post-surgery CT on the 104th day showed PVLs around large branches (black arrow in the left panel) and small branches of the portal vein (black arrow in the right panel).

3 讨论

不同术式的肝脏移植术是急慢性终末期肝脏疾病的一线治疗手段,其中经典术式仍然为1963年由Starzl等首创应用的原位肝移植术^[8-10],然而其仍有诸多术后并发症如肝动脉血栓形成(发生率成人12%,儿童40%)等^[11-13]。肝脏的淋巴起源于3条途径:肝内淋巴液大部分起源于肝窦,小部分来源于胆管和肝动脉—毛细血管网^[14]。淋巴管位于门静脉、肝静脉、肝动脉和胆管周围的结缔组织中,正常超过80%以上淋巴液由沿着门静脉和胆管的淋巴管引流到肝门,最终入乳糜池^[1]。

诸多研究认为肝移植术后IHLS与肝移植后的排斥反应、淋巴管道破坏后引起的淋巴水肿、胆管的渗漏及肝移植后肝坏死有关^[15-18]。当肝脏发生疾患,广泛累及肝小叶,正常小叶结构不复存在,血液循环系统遭到破坏,肝动脉分支未经肝血窦、中央静脉而直接进入肝静脉,造成肝静脉压升高,同时淋巴管大量增生、扩张,淋巴液明显增多,形成下腔静脉和门静脉分支周围血管外淋巴液套。另外,肝脏手术时可导致肝内淋巴管断裂,致使肝脏正常的肝内淋巴回流受损而致肝内淋巴管扩张^[14,15],从而构成了IHLS的形成CT或MRI影像的基础^[1],在影像学

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上 CT 表现为 PVLs, MRI 表现为 PVAI。本组研究显示 IHLS 征象可随着病情的变化而变化。然而, 尽管移植术后移植肝也可以有 IHLS 阳性, 但是部分并发症组 IHLS 持续时间较长, 远远超过肝脏淋巴管再生的正常时间, 目前尚难用手术完全去解释。IHLS 是否和术后并发症的发生有关联, 尚需进一步深入研究。

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