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# MRI 和螺旋 CT 增强在肝脏占位性病变诊断中的价值比较

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**摘要 目的:**对比分析 MRI 和螺旋 CT 增强在肝脏占位性病变诊断中的价值。**方法:**以 2012 年 7 月-2016 年 5 月我院收治的临床考虑为肝脏占位性病变 70 例患者为研究对象,将 70 例患者根据入组先后顺序分为两组,35 例行增强 CT 扫描,35 例行动态增强 MRI 扫描,比较两组患者的病理诊断结果、病灶个数及直径、增强 CT 及 MRI 的诊断结果和检查过程中的不良反应及耐受性。**结果:**CT 增强组和 MRI 增强组的肝脏占位性病变的病理诊断、病变类型、分布及病灶个数(71 vs 70)、病灶直径( $2.25 \pm 2.01$  cm vs  $2.19 \pm 1.98$  cm)比较差异均无统计学意义( $P > 0.05$ );以病理诊断结果为金标准,MRI 增强组的总诊断符合率为 85.71%,CT 增强组的总诊断符合率为 77.14%,MRI 增强组的总诊断符合率高于 CT 增强组,但差异无统计学意义( $P > 0.05$ );CT 增强组共发生 2 例不良反应,均为轻度恶心,MRI 增强组未出现造影剂不良反应,CT 增强组的不良反应发生率 (5.71% vs 0.00%) 及视觉模拟评分法 (VAS)评分(1.25 0.96 分 vs 0.71 0.56 分)均显著高于 MRI 增强组( $P < 0.05$ )。**结论:**CT 增强和 MRI 增强扫描对于肝脏占位性病变的诊断均具有较高的临床价值,其中 MRI 增强扫描的安全性和耐受性更高,临床医师可根据患者的经济状态、身体状态等因素的综合评估,选择合适的检查手段,必要时可两者联合检查,以提高诊断的准确性。

**关键词:**肝脏占位性病变;MRI;CT;增强

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## Diagnostic Value of MRI and CT for the Liver Space-occupying Lesions

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**ABSTRACT Objective:** To investigate the diagnostic value of MRI and CT for the liver space-occupying lesions. **Methods:** The clinical data of 70 cases of patients with liver space-occupying lesions in our hospital from June 2012 to May 2016 were divided into two groups and retrospectively analyzed. 35 cases underwent contrast enhanced ct scans (CT group), and others underwent dynamic contrast-enhanced MR imaging(MRI group). The pathological diagnosis, number of lesions and lesions diameter were ompared between two groups. **Results:** No significant difference was found in the pathological diagnosis, number of lesions(71 vs 70) and lesions diameter( $2.25 \pm 2.01$ cm vs  $2.19 \pm 1.98$  cm) between two groups( $P > 0.05$ ). As the gold standard by pathological diagnosis results, correct diagnostic rate of MRI group were 85.71%, which was 77.14% CT group and lower than that of the MRI group, but no significant difference was found between two groups ( $P > 0.05$ ). The incidence of adverse reactions in CT group was significantly higher than that of the MRI group ( $P > 0.05$ ). **Conclusion:** Both CT and MRI enhancement scanning have higher diagnostic value for the liver space-occupying lesions, but MRI enhancement scanning has higher safety and tolerability.

**Key words:** Liver space-occupying lesions MRI; CT; Enhancement

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### 前言

肝脏是人体最大的实质器官,易发生各种原发和继发性肿瘤。肝脏占位性病变是我国常见疾病之一,且发病率越来越高,检出率也随着各种影像技术的发展而提高<sup>[1,2]</sup>。肝脏占位性病变

包括良性病变和恶性病变两种,良性病变主要包括局灶性结节性增生、肝血管瘤、肝腺瘤、肝硬化结节、肝脓肿等,恶性病变主要包括肝细胞癌、肝内胆管细胞癌和混合型肝癌<sup>[3,4]</sup>。不同的肝脏占位性病变的临床症状、体征表现往往相似,缺乏典型特征,影响鉴别诊断的准确性。但肝脏占位性病变,尤其是恶性病变的早期准确诊断不仅是治疗方案选择的主要依据,同时也是影响患者生存时间的关键因素<sup>[5]</sup>。目前,临床中肝脏占位性病变的诊断手段主要为影像学检查,包括超声、数字减影血管造影技术(DSA)、CT 和磁共振成像(MRI)等<sup>[6,7]</sup>。近年来,CT 和 MRI 技术的迅速发展在肝脏占位性病变诊断中均展示了较高的效能,但两者均各有所长<sup>[8,9]</sup>。本研究拟回顾性分析我院 70 例肝脏占

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位性病变患者的增强 CT 和增强 MRI 的检查结果,对比分析两种方法的诊断价值,现报道如下:

## 1 资料与方法

### 1.1 一般资料

以 2012 年 7 月 -2016 年 5 月我院收治的临床考虑为肝脏占位性病变 70 例患者为研究对象,所有患者最终均经实验室血清生物学检查、穿刺细胞学检查或手术后经组织病理学检查确诊为肝脏占位性病变,所有患者病历资料完整,知情同意本研究,影像学检查前均未接受过放疗、化疗和介入治疗,心、肺和肾功能基本正常,既往无肾功能损伤和严重心脏疾病;排除合并严重糖尿病、重症高血压等疾病以及其他影像学检查禁忌症患者,如无法耐受增强扫描检查者、对检查中使用的对比剂过敏者、装有人工心脏起搏器等。

将 70 例患者根据入组先后顺序分为两组,35 例行增强 CT 扫描,其中男性 21 例,女性 14 例,年龄 30-75 岁,平均年龄(48.93 5.69)岁,病灶直径为 1.3-11.0 cm,平均直径(7.9 2.2)cm,单发病灶 26 例,多发病灶 9 例;35 例行动态增强 MRI 扫描,其中男性 22 例,女性 13 例,年龄 30-73 岁,平均年龄(48.02 5.61)岁,病灶直径为 1.2-11.3 cm,平均直径(7.5 2.0)cm,单发病灶 27 例,多发病灶 8 例。两组年龄、性别、病灶直径等一般资料比较,差异均无统计学意义( $P > 0.05$ ),组间具有可比性。本研究经我院伦理委员会批准,所有患者或家属均知情同意。

### 1.2 检查方法

增强 CT 检查方法:采用美国 phillips 128 层螺旋 CT。所有患者检查前 1 周内避免上消化道钡餐等检查,术前 6 h 禁食,检查前所有患者及家属签署知情同意书,检查前 30~45 min 饮用清水 500~1000 mL,充盈肠道;碘过敏试验阴性后行 CT 增强扫描,扫描参数:全视野轴位螺旋式扫描,管电压:120kV,管电流 300 mAs,层厚 1.5 mm,旋转速度 0.27 s/r,扫描范围为肝顶至肝下缘。患者取仰卧位,先行 CT 平扫后,再于肘正中静脉处使用高压注射器一次性注入浓度为 370 mg/mL 的非离子型对比剂碘海醇,对比剂总量 1.5 mL/kg,注射速度 4 mL/s。分别于对比剂注射后 20~30 s、50~55 s、180 s 采集动脉期、静脉期和延迟期数据,数据均传送至 ADW4.6T 工作站,采用标准算法重建对动脉、门静脉及延迟期血管进行重建,重建层厚 1~3 mm。

增强 MRI 检查方法:采用美国 GE discovery 3.0T 磁共振仪,信号采集使用 8 通道腹部相控阵表面线圈,对比剂为 0.5 mmol/mL 的钆喷酸葡甲胺盐注射液(Gd-DTPA)。术前 12 h 禁

食,检查前所有患者及家属签署知情同意书,并对患者进行呼吸、憋气即平稳训练。患者取仰卧位,双手置于身体两侧,先行常规 T1WI(T1 加权像)和 T2WI(T2 加权像)扫描,T1WI 扫描参数:TR 130 ms,TE 2.3 ms;T2WI 扫描参数:TR 6000 ms,TE:68 ms。之后于肘前静脉处使用高压注射器团注 Gd-DTPA,对比剂总量 0.2 mmol/kg,注射速度 3~4 mL/s,造影剂注射结束后以相同的注射速度紧跟注射 20 mL 生理盐水,扫描参数:TR: 3.7 ms,TE: 2.2 ms,层厚:4 mm,扫描时间:51 s,分别于对比剂注射后 5~10 s,60 s,180 s 采集动脉期、静脉期和延迟期数据,将采集的数据传送至 ADW4.6T 工作站,采用 Functool 软件分析患者的动脉、门静脉和肝实质内病灶的时间-信号强度曲线,并采用三维最大强度投影进行重建,分析病灶强化特点。

CT 和 MRI 的均由两名具有丰富临床工作经验的影像学医师进行独立判断分析,得出最终结论,两名医师意见分歧时另请 1 位医生进行判断分析。

### 1.3 观察指标

(1)一般资料:统计两组患者最终的病理诊断结果、病灶个数及病灶直径,并进行对比分析;(2)增强 CT 和增强 MRI 的诊断结果:将增强 CT 和增强 MRI 的检查结果与病理结果进行对比分析,计算两种检查方法的诊断结果与病理诊断结果的符合率;(4)不良反应及耐受性:检查结束后嘱咐患者休息 30min 后再离开,观察患者恶心、呕吐等不良反应发生情况;采用视觉模拟评分法 (VAS) 评分法评价患者检查过程中的不适感,0-10 分,0 分为无任何不适感,10 分为非常不适。

### 1.4 统计学分析

采用 SPSS17.0 统计学软件,计量资料以均值 $\pm$ 标准差表示,组间差异比较采用 t 检验,计数资料以百分率表示,组间差异比较采用卡方检验,以  $P < 0.05$  为差异具有统计学意义。

## 2 结果

### 2.1 两组一般资料比较

CT 增强组和 MRI 增强组的肝脏占位性病变的病理诊断、病变类型及病灶分布、个数、直径等进行比较,差异均无统计学意义( $P > 0.05$ ),见表 1。CT 增强组的 6 例肝良性病变分别为:1 例肝结核,2 例肝脓肿,2 例局灶性结节性增生,1 例肝血管瘤;MRI 增强组的 6 例肝良性病变分别为:1 例肝结核,1 例炎性肌纤维母细胞瘤,1 例肝脓肿,2 例局灶性结节性增生,1 例肝血管瘤。

表 1 两组一般资料比较

Table 1 Comparison of the general data between two groups

| The pathological diagnosis of lesions | CT enhancement group |                |                       | MRI enhancement group |                |                       |
|---------------------------------------|----------------------|----------------|-----------------------|-----------------------|----------------|-----------------------|
|                                       | cases(n)             | Lesions number | Lesions diameter (cm) | cases(n)              | Lesions number | Lesions diameter (cm) |
| Liver benign lesions                  | 6                    | 10             | 2.56 $\pm$ 1.55       | 6                     | 10             | 2.51 $\pm$ 1.69       |
| Hepatocellular carcinoma              | 9                    | 15             | 2.37 $\pm$ 1.96       | 10                    | 13             | 2.30 $\pm$ 1.72       |
| Intrahepatic cholangiocarcinoma       | 7                    | 9              | 3.02 $\pm$ 1.88       | 6                     | 8              | 2.94 $\pm$ 1.78       |
| Liver metastases                      | 13                   | 37             | 1.52 $\pm$ 1.15       | 13                    | 39             | 1.59 $\pm$ 1.20       |
| Total                                 | 35                   | 71             | 2.25 $\pm$ 2.01       | 35                    | 70             | 2.19 $\pm$ 1.98       |

### 2.2 CT 增强和 MRI 增强的诊断与病理结果比较

以病理诊断结果为金标准,MRI 增强组经增强 MRI 扫描

后的总诊断符合率为 85.71%,CT 增强组经增强 CT 扫描后的总诊断符合率为 77.14%,MRI 增强组的总诊断符合率高于 CT 增强组,但差异无统计学意义( $P>0.05$ )。

表 2 CT 增强和 MRI 增强的诊断与病理结果比较

Table 2 Comparison of the diagnostic and pathological results between two groups

|                                 | CT enhancement group(n=35) |                 |                                                     | MRI enhancement group(n=35) |                 |                                                     |
|---------------------------------|----------------------------|-----------------|-----------------------------------------------------|-----------------------------|-----------------|-----------------------------------------------------|
|                                 | Accurate diagnosis         | Fault diagnosis | The coincidence rate with pathological diagnosis(%) | Accurate diagnosis          | Fault diagnosis | The coincidence rate with pathological diagnosis(%) |
| Liver benign lesions            | 4                          | 2               | 66.67                                               | 5                           | 1               | 83.33                                               |
| Hepatocellular carcinoma        | 8                          | 1               | 88.89                                               | 9                           | 1               | 90.00                                               |
| Intrahepatic cholangiocarcinoma | 4                          | 3               | 57.14                                               | 5                           | 1               | 83.33                                               |
| Liver metastases                | 11                         | 2               | 84.62                                               | 11                          | 2               | 84.62                                               |
| Total                           | 27                         | 8               | 77.14                                               | 30                          | 5               | 85.71                                               |

### 2.3 两组不良反应及耐受性比较

CT 增强组共发生 2 例不良反应,均为轻度恶心,MRI 增强组未发现任何造影剂不良反应,CT 增强组的不良反应发生率及 VAS 评分均显著高于 MRI 增强组( $P<0.05$ )。

表 3 两组不良反应及耐受性比较

Table 3 Comparison of adverse reactions and tolerance between two groups

|                       | Adverse reactions    | VAS score(score)        |
|-----------------------|----------------------|-------------------------|
| CT enhancement group  | 2(5.71) <sup>°</sup> | 1.25± 0.96 <sup>°</sup> |
| MRI enhancement group | 0(0.00)              | 0.71± 0.56              |

注:与 MRI 增强组比较,<sup>°</sup>  $P<0.05$ 。

Note: Compared with MRI enhancement group, <sup>°</sup>  $P<0.05$ 。

### 3 讨论

肝脏占位性病变是指广义的肝脏肿瘤,分为良性病变和恶性病变,对于病变范围和病变性质的早期诊断具有重要的临床价值,临床可根据病变范围和病变性质为患者选择个体化的治疗方案,如肝脏良性病变患者可选择手术或保守治疗,有限的、可切除性肝转移瘤可选择根治性手术,病灶少于 3 个的患者可进行肝移植,病变范围广泛的患者可进行肝动脉化疗栓塞、全身化疗或射频消融等<sup>[9-11]</sup>。CT 增强扫描和 MR 增强扫描是临床常用的肝脏占位性病变的影像学诊断手段,均在不同方面和不同程度显示了对于肝脏占位性病变的良好诊断效能<sup>[12-14]</sup>。

CT 检查对于正常组织和病变组织的区分主要依据为两者的密度、两者间的解剖关系及病变的大小形态等,因此对于一些病变组织密度无显著变化或微小病灶易漏诊或误诊<sup>[15-18]</sup>。CT 增强扫描可通过注射非离子碘对比剂增加正常组织和病变组织对比度进而提高密度分辨率,且可显示病灶的血供情况,尤其对于肝细胞结节性增生具有较高的诊断价值<sup>[19]</sup>。MRI 扫描因可对肝组织进行多方位成像,与 CT 扫描比较,可反映不同组织间的信号差异,使相关参数更加丰富<sup>[20-23]</sup>,且 MRI 增强扫描中所用 Gd-DTPA 对比剂在病变组织中的量与该组织的血供丰富程度呈显著正相关,因此可反应病变组织的微血管状态,进而可通过微血管的密度、血管通透性等特质判断病变的性质,因此对于病灶的检出率和定性诊断能力更高<sup>[24,25]</sup>。本研究结果同样显示在排除病变类型、病变数量和病变直径对诊断结果影

响的基础上,MRI 增强组的总诊断符合率高于 CT 增强组,但两组间比较差异无统计学意义,可能因为本研究样本量太小,致使结果存在一定偏倚。而影响 CT 准确诊断的原因可能有:病灶直径太小,病灶密度与周围组织差异不大,扫描层距等<sup>[26]</sup>;影响 MRI 确诊的原因可能有:病变组织微血管状态无典型变化,病灶直径太小等<sup>[27,28]</sup>。本研究结果还显示 CT 增强组共发生 2 例不良反应,均为轻度恶心,MRI 增强组未发现任何造影剂不良反应,CT 增强组的不良反应发生率及 VAS 评分均显著高于 MRI 增强组,提示 MRI 增强扫描的安全性和耐受性更高,可能因为 MRI 增强扫描中,对比剂的使用总剂量较小,且无 X 线辐射,患者接受度更高。但与 CT 相比,MRI 具有费用高,医院覆盖率低的缺点<sup>[29,30]</sup>。

综上所述,CT 增强和 MRI 增强扫描对于肝脏占位性病变的诊断均具有较高的诊断价值,其中 MRI 增强扫描的安全性和耐受性更高,临床医师可根据患者的经济状态、身体状态等因素的综合评估,选择合适的检查手段,必要时可两者联合检查,以提高诊断的准确性。

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