

· 论著 ·

隐匿性骨折应用多层螺旋CT与放射DR平片的临床诊断价值对比分析

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【摘要】目的 探究隐匿性骨折应用多层螺旋CT与放射DR平片的临床诊断价值。方法 选取2018年11月至2021年11月本院收治高度怀疑为隐匿性骨折的患者100例，多层螺旋CT和放射DR平片均用于诊断。分析两种诊断方法的检出率、诊断时间和费用。结果 利用DR检测出隐匿性骨折14例，检出率为14.00%，采用MSCT共检测出50例隐匿性骨折，检出率为50.25%。比较检测数据的差异，差异明显($\chi^2=29.781$, $P<0.001$)，具有统计学意义。MSCT检测方式的诊断时间和费用均显著高于放射性DR平片($P<0.05$)。结论 多层螺旋CT对患者的诊断时间长，成本相对较高，但隐匿性骨折的检出率高，值得临床推广使用。

【关键词】隐匿性骨折；多层螺旋CT；放射DR平片；诊断价值；

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Comparative Analysis of Clinical Diagnostic Value of Multi-slice Spiral CT and Radiation DR Plain Film in Occult Fracture

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Abstract: Objective To explore the clinical diagnostic value of multi-slice spiral CT and radiation DR plain film in occult fracture. **Methods** 100 patients with highly suspected occult fractures admitted to our hospital from November 2018 to November 2021 were selected. Multislice spiral CT and radiation DR plain films were used for diagnosis. The detection rate, diagnosis time and cost of the two diagnostic methods were analyzed. **Results** 14 cases of occult fractures were detected by DR, and the detection rate was 14.00%. 50 cases of occult fractures were detected by MSCT, and the detection rate was 50.25%. The difference in the test data was statistically significant ($\chi^2=29.781$, $P<0.001$). The diagnostic time and cost of MSCT were significantly higher than those of radioactive DR ($P<0.05$). **Conclusion** Multi-slice spiral CT has long diagnosis time and high cost for patients, but the detection rate of occult fractures is high, which is worthy of clinical promotion.

Keywords: Occult Fracture; Multi-slice Spiral CT; Radioactive DR Plain Film; Diagnostic Value

隐匿性骨折一般无明显移位，骨折端连接紧密，相对稳定，不易发现^[1]。起病部位与临床症状和体征基本一致，是一种无法通过X线检测到的骨折类型，或者显示在初始X光片上遗漏的细微异常，通常是通过回顾性观察或其他影像学方法确认的^[2-3]。尽管对于隐匿性骨折没有公认的诊断金标准，目前，很多肢体骨关节骨折患者都是通过DR(数字X线成像)诊断来判断患者是否存在隐匿性骨折^[4-5]。X线检查是临床影像学的首选，但X线平片检查对隐匿性骨折有一定的局限性，疑似骨折易出现漏诊、误诊情况，延误了隐匿性骨折患者的临床治疗^[6-7]。对隐匿性骨折患者实施多层螺旋计算机断层扫描(MSCT)扫描和三维重建技术，有助于快速、准确地诊断损伤，为患者提供更详细的影像数据^[8-9]。因此本研究拟探讨隐匿性骨折应用多层螺旋CT与放射DR平片的临床诊断价值，为医疗检验提供更多方法。

1 对象与方法

1.1 研究对象 选取2018年11月至2021年11月本院收治就诊于本院高度怀疑是隐匿性骨折的患者100例，男性47例，女性53例，年龄23~69岁，平均年龄(43.98±5.76)岁。

纳入标准：存在因外伤相关的局部疼痛和四肢肿胀的患者；临床资料完整；患者均签署了详细完整的书面同意书。排除标准：合并已确诊为骨折、多处骨折患者；合并颅骨、脊柱或骨盆受伤患者；合并先天发育不良、感染患者。

1.2 方法 所有高度怀疑为隐匿性骨折的患者均先进行放射DR平片检查，X光射线仪器由飞利浦提供。然后，我们使用MSCT扫描了患者。我们使用相关的操作仪器来调整患者的体位和姿势，以建立正确的扫描方法。在CT扫描过程中，扫描范围是划分的。定位患者骨折图像，合理设置扫描参数。控制参数为120kV，重建间隔为0.9mm，层厚为5.1mm，重建层厚为1.26mm，骨窗为骨，重建功能为B80 svery sharp。处理扫描的数据并重建图像。

根据显示的面影重组多平面和三维成像重建技术，了解和掌握患者的多向病变情况。然后，两位经验丰富的资深医生读取片，以明确诊断是否有骨折，并以最终观点为准。

1.3 观察指标 (1)观察DR及MSCT两种检查方法对隐匿性骨折的检出率。(2)比较DR及MSCT两种检查方法的诊断时间和成本评估。

1.4 统计学处理 采用统计软件SPSS 21.0对数据进行分析，符合正态分布的计量资料采用($\bar{x} \pm s$)表示，比较采用t检验，计数资料以例数或率表示，两组比较采用 χ^2 检验，当 $P<0.05$ 时，差异有统计学意义。

2 结果

2.1 DR与MSCT对隐匿性骨折患者的诊断结果对比 利用DR检测出隐匿性骨折14例，检出率为14.00%，采用MSCT共检测出50例隐匿性骨折，检出率为50.25%。比较检测数据的差异，差异明显($\chi^2=29.781$, $P<0.001$)，具有统计学意义，见表1。

表1 DR与MSCT对隐匿性骨折患者的诊断效率对比

组别	例数	检出率 (%)
DR	100	14(14.00)
MSCT	100	50(50.00)
χ^2		29.781
P		<0.001

2.2 DR与MSCT两种方式的诊断时间和费用比较 MSCT检测方式的诊断时间和费用均显著高于放射性DR平片($P<0.05$)，见表2。

表2 DR与MSCT的诊断时间、费用对比

组别	例数	诊断时间 (min)	诊断费用 (元)
MSCT	100	34.54±3.65	512.65±23.76
DR	100	23.65±7.32	135.76±11.87
t		13.314	141.901
P		<0.001	<0.001

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3 讨论

随着社会的发展,交通事故、工伤等事故不断增加,创伤患者数量不断增加^[10]。隐匿性骨折是指由不同程度的创伤引起的骨折,常规X线片不易发现^[11]。由于其隐蔽位置或轻微骨折,隐匿性股颈骨折经常被误诊,一旦误诊,未移位的骨折可能会移位^[12]。发生这种情况时,患者可能需要接受关节置换术治疗,这比接骨术更具侵入性^[13]。隐匿性骨折被广义定义为在初始X光片上遗漏的X光片无法检测的细微异常,骨折的异常可能包括因关节积液而导致的脂肪垫征、不稳定的压力痛点和异常肿胀^[14-15]。隐匿性骨折不易通过X光片诊断,对于隐匿性骨折,非手术保守治疗应作为一线治疗^[16-17]。隐匿性骨折延迟会导致疼痛、血栓栓塞并发症甚至死亡率增加等后果^[19]。骨折治疗的主要目标是使患者恢复到骨折前的功能水平^[20]。隐匿性骨折的早期诊断将缩短住院时间,从而降低成本^[21]。为防止潜在的严重不良事件的发生,应对疑似隐匿性骨折的患者寻找更合适的诊断检测方式^[23]。X线平片可分为3种类型,第一种是现有的胶片式射线照相术(FR)^[24]。这可以像使用带有化学反应的投射辐射的黑白图像的摄影胶片一样获得。研究人员将其命名为“胶片式射线照相术”,并将其标记为FR^[25]。其次,有计算机射线照相(CR)类型,它通过用CR处理从放射线获得的数字图像来合成图像。第二种是DR,它通过数字化获得吸收投射辐射的辐射盒的图像^[26]。这种方法是最先进的射线照相,但众所周知,该方法在分辨率上与CR没有太大差异。由于数字技术的发展,X线平片得到了很大的改进,类型也迅速从FR转变为CR或DR。国内外多家医疗机构已采用CR或DR型射线照相;FR仍然被广泛使用,但预计最终会被CR或DR取代^[27]。MSCT扫描速度快,图像分辨率高。由于骨折部位的不同,检测难度也较大,呈递增、递进变化^[28]。在四肢的骨关节骨折中,隐匿性骨折很难诊断。在诊断过程中,很多骨折问题很难在第一时间发现,而且经常出现遗漏,对骨关节骨折患者的康复非常不利^[29]。这就需要对隐匿性骨折的判断原理进行准确的判断和评价,才能有效保证临床诊断的准确性。在诊断隐匿性骨折患者时,虽然使用X线片有一定的帮助,但X线片在应用上有一定的局限性^[30]。X线片局限性非常不利于医生准确判断患者骨折状况。MSCT后处理技术的有效利用比X射线胶片的应用更有优势。MSCT后处理技术不仅具有快速的扫描速度,而且具有非常好的扫描效果^[31]。它可以了解和掌握扫描图像的垂直和水平变化,研究和分析图像的特征。发现可疑隐匿性骨折部位,对患者四肢关节症状可进行更深入的假设和判断。使用MSCT扫描后,患者四肢和关节的横截面会出现变化^[32]。横截面、矢状面、冠状面和斜面都是平面,我们区分扫描图像的骨折线,了解患者四肢和关节骨碎片的分布情况,这样就可以明确患者四肢和关节的骨折范围^[33]。DR检查髌骨、髌白、踝关节后踝、本垒打内上髌、第4~5掌骨基部重叠,骨折线较小,脱位通常不明显,易发生误诊^[34]。

本研究中采用MSCT扫描对隐匿性骨折患者进行检查,然后显示表面阴影和重建平面,重建3D成像,可以清晰地观察到隐匿性骨折患者的骨折图像,尤其是重建平面,可以显示在多个层面上,会清楚地显示患者的骨折线、相对较小的骨折碎片以及相邻组织结构之间的关系。本研究中虽然MSCT检测方式的诊断时间和费用均显著高于放射性DR平片,但是通过对隐匿性骨折检出结果的对比,可以得出MSCT技术在判断诊断隐匿性骨折上面比X线平片更有优势。

综上所述,采用MSCT技术有助于临床及早识别隐匿性骨折患者,进而采取更准确、更恰当的治疗。然而本研究的样本量有限,未来计划开展多中心大样本研究以增加研究结果的可信度。

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