

侧方应力摄片测量和膝关节 MRI 诊断内侧副韧带损伤的临床研究

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【摘要】 目的: 研究双膝外翻应力位摄片对膝关节内侧副韧带损伤的诊断意义。方法: 自 2008 年 1 月至 2011 年 6 月收治膝关节内侧副韧带损伤 46 例, 31 例行手术治疗, 15 例保守治疗, 其中 1 例保守治疗 3 个月无效后手术。其中男 32 例, 女 14 例; 年龄 28~72 岁, 平均(49.46±22.54)岁; 左膝 22 例, 右膝 24 例。常规行损伤侧、正常侧的应力位下和非应力位下 X 线摄片和 MRI 检查, 对于内侧间隙明显增宽和 MRI 表现有深层断裂及后交叉韧带损伤的择期行切开内侧副韧带行缝合或重建术。以胫骨平台内侧髁和外侧髁作一条连线记为 A 线, 将此线向上平移至股骨内侧髁最内缘记为 B 线, 然后测量这 2 条线的垂直距离记为 C。间隙差比值(R)计算方法为(患侧应力下间隙-患侧无应力下间隙)/(健侧应力下间隙-健侧无应力下间隙)。总结 R 值区间与术中所见韧带损伤种类的关系。结果: 46 例中 17 例有韧带浅层撕裂, 21 例深层断裂, 8 例合并有后关节囊或后交叉韧带断裂, 当比值介于 1.51~5.24 时, 内侧副韧带损伤表现为浅层撕裂的有 15 例, 实际损伤为 17 例, 诊断正确率为 88.24%; 当比值介于 5.28~13.85 时, 表现为深层断裂的有 19 例, 实际损伤为 21 例, 诊断正确率为 90.48%; 当比值介于 15.61~26.25 时, 表现为合并后关节囊或交叉韧带断裂的有 7 例, 实际损伤为 8 例, 诊断正确率为 87.50%。结论: 以膝关节受伤侧关节间隙差值与正常侧差值的比值作为衡量标准, 可以提供膝关节内侧副韧带损伤的量化分级。

【关键词】 膝关节; 内侧副韧带; 放射摄影术

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Diagnosis of medial collateral ligament injury by stress X-ray and MRI of knee joint ZHANG Long-jun, CHEN Jian-liang, XU Yong, ZHU Shao-bing. Department of Orthopaedics and Traumatology, Hospital of Traditional Chinese Medicine, Shangyu 312300, Zhejiang, China

ABSTRACT **Objective:** To study the application of stress X-ray of knee joint for the diagnosis of medial collateral ligament injury. **Methods:** From January 2008 to June 2011, 46 patients with medial collateral ligament injury were reviewed. Among the patients, 32 patients were male and 14 patients were female, ranging in age from 28 to 72 years, with an average of (49.46±22.54) years. Left knee joint injuries occurred in 22 patients, and 24 patients had injuries in right knee joint. Thirty-one patients were treated with surgical method, and 15 patients were treated with conservative method including 1 patient finally received operation after 3 months treatment with conservative method without effect. The injury side and normal side were observed by X-ray under stress and non-stress, as well as MRI. Operation was used to treat patients with medial gap markedly widen and the deep layer of medial collateral ligament injury in MRI. A line (line A) was drawn from medial condyle to lateral condyle of tibia platform. The line A was translated to the inner margin of condylus medialis femoris, which was line B. The perpendicular distance was measured, which was line C. The ration of space difference(R) was calculated by (space at stress force of injured side-space at non-stress force of injured side)/(space at stress force of normal side-space at non-stress force of normal side). The relationship between R and ligament injury type were investigated. **Results:** There were 17 patients with injuries of superficial lamella, 21 patients with injuries of deep lamella. Eight patients had associated injuries of articular capsule and posterior cruciate ligament. When R value was between 1.51 to 5.24, the injury of superficial ligament was found in 15 patients, actual injuries were found in 17 patients. When R value between 5.28 and 13.85, the injuries of bathypelagic ligament were found in 19 patients, actual injuries were found in 21 patients. When R value was between 15.61 and 26.25, the associated injuries of articular capsule and posterior cruciate ligament were found in 7 patients, actual injuries were found in 8 patients. **Conclusion:** Using the specific value as the standard of measurement can provide the quantizately fractionation of the medial collateral ligament injury.

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内侧副韧带具有保持膝关节的稳定和运动作用。一旦在伸直位或屈曲位时,受到来自外侧的直接作用力或小腿的突然外展外旋,均可致其损伤。膝关节外翻应力试验(双膝 X 线对比检查)、MRI 以及关节镜是诊断内侧副韧带损伤的主要方法,由于在基层医院中 MRI 和关节镜普及率问题常不能作为常规诊断方法,而膝关节外翻应力试验(双膝 X 线对比检查)是一种简单而有效的方法。为提高这种检查方法的诊断准确性和精确性,本次研究将收治的内侧副韧带损伤患者损伤侧、正常侧的应力位下和非应力位下 X 线测量间隙差比值(R)与 MRI 及手术中所见相对照,旨在观察内侧间隙的宽度变化与韧带损伤的相关性,总结出 X 线的分级。

1 资料与方法

1.1 临床资料 2008 年 1 月至 2011 年 6 月收治膝关节内侧副韧带损伤 46 例,31 例行手术治疗,15 例保守治疗,其中 1 例在保守治疗 3 个月无效后手术。其中男 32 例,女 14 例;年龄 28~72 岁,平均(49.46±22.54)岁;左膝 22 例,右膝 24 例;运动或滑倒跌伤 30 例,车祸致伤 16 例。入院时查体示膝关节内侧间隙压痛明显,根据受伤机制高度怀疑侧副韧带损伤者,常规行损伤侧、正常侧的应力位下和非应力位下的 X 线摄片和 MRI 检查,对于内侧间隙明显增宽和 MRI 表现有深层断裂及后交叉韧带损伤的择期行切开内侧副韧带缝合及重建术,交叉韧带 II 期处理。

1.2 应力位下双膝 X 线摄片方法 采用应力位下双膝 X 线摄片方法来评测韧带损伤,患者仰卧于摄影床上,双膝屈曲 15°~30°,膝关节上方 5~10 cm 处用弹力绷带绑紧。踝关节间置足够厚垫使膝关节尽量外翻,若患者因疼痛而不能外翻,应在膝关节处用局麻药,摄双侧膝关节正位 X 线片。

1.3 治疗方法 15 例考虑浅层损伤的患者行保守治疗,给予石膏固定。其余 31 例行手术治疗,常规行切开内侧副韧带修补术。交叉韧带 II 期行关节镜下重建术。术后常规固定和康复治疗。

1.4 观测指标与方法 以胫骨平台内侧髁和外侧髁作一条连线记为 A 线(图 1),将此线向上平移至股骨内侧髁最内缘记为 B 线,然后测量这 2 条线的垂直距离记为 C。间隙差比值(R)计算方法:(患侧应力下间隙-患侧无应力下间隙)/(健侧应力下间隙-健侧无应力下间隙)。

2 结果

46 例中 17 例韧带浅层撕裂,21 例深层断裂,

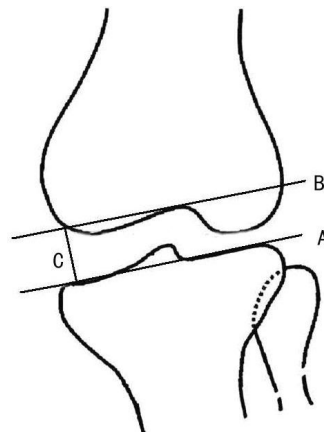


图 1 膝关节内侧间隙测量示意图

Fig.1 Measurement of lateral space of knee joint

8 例合并有后关节囊或后交叉韧带断裂。当比值介于 1.51~5.24 时,内侧副韧带损伤表现为浅层撕裂的有 15 例,实际损伤 17 例,诊断正确率为 88.24%;当比值介于 5.28~13.85 时,表现为深层断裂的有 19 例,实际损伤 21 例,诊断正确率为 90.48%;当比值介于 15.61~26.25 时,表现为合并后关节囊或交叉韧带断裂的有 7 例,实际损伤 8 例,诊断正确率为 87.50%。1 例 X 线表现不明显,但 MRI 表现为深层断裂的未行手术治疗,3 个月后仍有内侧不稳,重新手术治疗,结果证实为深层断裂。2 例内侧间隙较大而 MRI 表现为韧带撕裂的患者行手术治疗,结果证实为韧带的浅层撕裂。

3 讨论

3.1 膝内侧副韧带的应用解剖 膝内侧副韧带上端起自股骨内收肌结节前下方股骨内上髁,前后两束:前束纤维较长,垂直向下止于胫骨内侧面相当于胫骨粗隆水平,为鹅足腱所遮,与关节囊及半月板间有稀松的结缔组织相隔,半膜肌腱纤维伸展于韧带的深面,膝伸直位时紧张;后束纤维短,在关节水平呈扇形向后下止于关节囊、半月板,并与斜韧带起点相连,屈膝 30°时紧张。膝关节逐渐伸直过程中,膝内侧副韧带向前滑动;屈膝过程中,则向后滑动。在膝屈、伸过程中,膝内侧副韧带始终有一部分纤维处于紧张状态,以保持膝关节的稳定,使股胫骨贴近不能远离,起到将膝关节的活动度有效地限制在一定范围的作用。

3.2 膝内侧副韧带的 X 线分级与韧带损伤的相关性 应力位下双膝 X 线检查方法简单,费用低廉,成为诊断该韧带损伤的重要方法,在基层医院应用广泛。修晓光等^[1]发现术前行应力位摄 X 线片示内侧间隙明显增大,术中证明为完全性断裂。但是对于

怎样计算内侧间隙无统一定论。以往国内的研究一般都采用测量两侧内侧间隙最宽处的直线距离,然后算出两侧的差值作为 X 线的分级标准,并做了相应的总结^[2-3]。Sawant 等^[4]的内侧间隙计算方法为胫骨内侧髁顶点至股骨内外侧髁连线的垂直距离,并引入比值来判断有无合并前后交叉韧带损伤,但未对内侧副韧带损伤做进一步分级。以上均存在一定缺陷,包括内侧间隙测量的方法不够精确,没有双侧进行对比。本研究所采用的方法既避免了由于先天变异或关节增生所造成的测量不准确,又进行了双侧的对比,则避免了先天变异所引起的假阳性。

3.3 本研究方法的优点 ①操作方法简单,花费低廉,适于基层医院推广。②避免了单纯以膝关节内侧面点之间测量的缺陷,点对点间的测量可能因解剖标志的不恒定引起测量的不准确。③以膝关节受伤侧关节间隙差值与正常侧差值的比值作为衡量的标准,避免个体差异的影响。④基本上可以提供膝关节内侧副韧带损伤的量化分级,而 MR 不能提供内侧副韧带损伤的量化分级。

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下肢腱鞘巨细胞瘤的 MRI 诊断及临床应用

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【摘要】 目的:分析腱鞘巨细胞瘤的 MRI 表现,探讨其 MRI 的诊断价值。方法:回顾性分析经手术病理证实的腱鞘巨细胞瘤 20 例的 MRI 检查资料。男 8 例,女 12 例;年龄 15~61 岁,平均 35.5 岁。所有病例行 MRI 检查。结果:病变位于膝关节 16 例,足趾关节和踝关节各 2 例。其中局限性 19 例,弥漫性 1 例,MRI 均表现为下肢骨关节旁软组织肿块,肿瘤与骨骼肌相比,T1WI 上 15 例接近于骨骼肌信号,5 例稍低于骨骼肌信号;在 T2WI 上 4 例介于骨骼肌与皮下脂肪信号之间,13 例接近于骨骼肌信号,3 例稍低于骨骼肌信号。16 例行 T1WI 增强扫描,5 例呈均匀强化,11 例呈不均匀强化。4 例伴邻近骨质破坏。结论:MRI 能明确显示下肢骨关节旁腱鞘巨细胞瘤病变的部位、形态及内部信号特征,对临床诊断、指导临床治疗和随访具有重要价值。

【关键词】 巨细胞瘤; 腱鞘; 磁共振成像; 下肢

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Diagnosis and clinical application of MRI for giant cell tumor of tendon sheath in lower extremity PAN Guo-ping*, ZHAO Liu-jun, FANG Yuan, FENG Ren-hai. *Department of Radiology, the Sixth Hospital of Ningbo, Ningbo 315040, Zhejiang, China

ABSTRACT **Objective:** To analyze the manifestation and investigate the value of MRI in the diagnosis of giant cell tumor of tendon sheath (GCTTS). **Methods:** Twenty patients with GCTTS proved by operation and pathology were retrospectively analyzed. There were 8 males and 12 females. The average age was 35.5 years, range from 15 to 61 years. All the patients underwent MRI examination. **Results:** Among the 20 cases, 16 patients had the tumor in knee joint, 2 patients had the tumor in interphalangeal articulation of foot and ankle joint respectively. Nineteen patients had limited tumor and 1 patient had diffuse tumor. The soft tissue mass localized beside lower extremity osteoarticulation was displayed on MRI images. On T1WI, the signal intensities of GCTTS almost equaled to those of skeletal muscle in 15 cases and were slightly lower than those of skeletal mus-