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3.0T MRI评估青年人群膝关节前交叉韧带(ACL)损伤的危险相关因素

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Assessment of the related risk factors for anterior cruciate ligament (ACL) injury with 3.0T MRI

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摘要

目的 探讨3.0T MRI评估青年人群前交叉韧带(anterior cruciate ligament, ACL)损伤的危险相关因素。方法 回顾性分析已确诊ACL损伤的患者69例(其中男35例,女34例)及正常对照组62例(其中男33例,女29例)膝关节3.0T MRI扫描资料,比较MRI诊断ACL损伤的敏感性、特异性及准确性。测量不同性别人群及损伤组与正常组的膝关节形态,测量参数包括:股骨髁间凹的宽度(notch width, NW)、股骨内外侧髁的总长(bicondylar width, BW)以及两者的比例即髁间窝宽度指数(NW index, NWI),内侧髁至髁间凹的宽度(medial condyle size, M)、外侧髁至髁间凹的宽度(lateral condyle size, L)及两者的比值(L:M),并测量不同性别及损伤组与未损伤组胫骨内侧平台坡度(medial tibial plateau slope, MTS)及外侧髁胫骨平台坡度(lateral tibial plateau slope, LTS)。结果 MRI诊断ACL损伤的敏感性为94.2%,特异性为92.3%,准确性为93.5%。68例男性与63例女性比较, BW、L及NWI的差异有统计学意义($P < 0.05$), NW、M及L:M的差异无统计学意义($P > 0.05$), 青年男性与女性膝关节形态不同, 男性膝关节的NWI较女性更小, 在男性ACL损伤组与正常组相比, BW、L:M及NWI的差异有统计学意义($P < 0.05$), ACL损伤组的NWI更小; 而女性中ACL损伤组与正常组相比, 各参数的差异均无统计学意义。所有参数在活动的强度及损伤部位(左右)之间的差异均无统计学意义($P > 0.05$)。ACL损伤组与正常组相比, 身高、体重、MTS及LTS的差异均无统计学意义($P > 0.05$)。结论 较小的NWI很可能是青年男性ACL损伤的危险相关因素, BW及L:M是影响青年男性膝关节动力学的重要因素。MTS和LTS可能无法作为膝关节ACL损伤的直接危险相关因素。

关键词: 膝关节, 前交叉韧带(ACL), 髁间窝宽度指数(NWI), 胫骨平台坡度

Abstract:

Objective To explore the related risk factors of anterior cruciate ligament (ACL) injury in the young people on 3.0T MRI scans. Methods MRI findings of patients confirmed ACL injury (including 69 cases of 35 males and 34 females) and 62 normal controls (including 33 males and 29 females) were retrospectively analyzed. We compared the diagnostic sensitivity, specificity and accuracy of MRI with operative results. The bone morphology between men and women, between the injured group and the control group were compared with 3.0T MRI. MRI measurements of notch width (NW), bicondylar width (BW), NW index (NWI), lateral condyle size (L), medial condyle size (M) and lateral to medial condyle ratio (L:M), medial tibial plateau slope (MTS) and lateral tibial plateau slope (LTS) were taken from all the subjects. Results MRI findings as compared with operative results showed specificity, sensitivity and accuracy were respectively 94.2%, 92.3% and 93.5%. We found a statistically significant difference in BW, L and NWI in 68 young males and 63 young females ($P < 0.05$), while there was no difference in NW, M, L:M ($P > 0.05$). There were differences between male and female young group. The knee morphology of the male is different from the normal group. NWI of the male knee joint was smaller than female. When knee morphology was compared between injured and normal subjects, the male group showed significant differences in BW, L:M and NWI ($P < 0.05$). For the female group, there was no difference in all parameters with and without ACL injury ($P > 0.05$). Statistical analysis suggested that there was no difference with regard to age, activity intensity and injury site ($P > 0.05$). There was no significant differences in height and weight in LTS and MTS between ACL injured and without injury ($P > 0.05$). Conclusions Narrower NWI may be related risk factor for ACL injury in young male. BW and L:M may be important factors in influencing young male's knee joint dynamics. LTS and MTS may be not direct related risk related factors in young people with and without ACL injury.

Key words: knee joint anterior cruciate ligament (ACL) notch with index (NWI) tibial plateau slope

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