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Morphological evaluation of Blumensaat's line in the quadrant method

Toshihiro Seki
Yamaguchi University, Japan

Introduction: For evaluation of bone hole position on the femur side after reconstructive surgery for knee anterior cruciate ligament (ACL), it is common to perform Quadrant method reported by Bernard et al. using 3D-CT. Quadrant method is based on Blumensaat's line, but it is reported that the form of Blumensaat's line has variation. We report on the form of Blumensaat's line at 3D-CT photographed after ACL surgery.

Methods: Patients who underwent ACL reconstruction at our department and related hospitals from April 2014 to August 2016 were 106 cases and 107 knees. The breakdown was 60 males and 46 females. Among them, 99 subjects and 100 knees, under 50 years of age, with no progress of arthropathy change due to existing meniscal lesion etc., were targeted. Shooting 3D-CT was done within two weeks after surgery. According to the Quadrant method, the femoral condyle part was halved along the femoral axis, the intercondylar was confirmed from the inside, and the Blumensaat's line was confirmed. I investigated the variation straight type (ST), small hill type (S), and large hill type (L) which are reported by Iriuchishima et al.

Results: In all cases, there were ST 38 cases (38%), S 22 cases (22%), L 40 cases (40%).

Conclusion: Iriuchishima et al,. investigated the shape of Blumensaat's line at cadaver and reported that variation exists in addition to straight type. In this case we conducted a similar survey using 3D-CT in cases under 50 years of age, but it was almost the same rate. When using the Quadrant method Blumensaat's line has many forms other than the straight type, so it was considered necessary to evaluate the femoral bone hole carefully.

Recent Publications

1. Bernard M et al. (1997) Femoral insertion of the ACL. Radiographic quadrant method. American Journal of Knee Surgery 10(1):14-21.
2. Ferretti M et al. (1999) Osseous landmarks of the femoral attachment of the anterior cruciate ligament: an anatomic study. Arthroscopy 23(11):1218-1225.
3. Iriuchishoima T (2016) Blumensaat's line is not always straight: morphological variations of the lateral wall of the femoral intercondylar notch. KSSTA 24(9):2752-2757.
4. Jaron P (2015) Radiographic anatomy of the native anterior cruciate ligament: a systematic review. HSS Journal 11(2): 154-165
5. Farrow LD (2008) Radiographic classification of the femoral intercondylar notch posterolateral rim. Arthroscopy 23:1218-1225

Biography

Toshihiro Seki has his expertise in evaluation and passion in improving the ACL reconstruction. He is doing research with enthusiasm for improving the technology of ACL reconstruction techniques. He is the leading expert in Knee Sports in Yamaguchi Prefecture, Japan. This research is part of the result of research at Yamaguchi University Hospital.

joint.seki@gmail.com

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