

Assessment of the Patellofemoral Joint Condition and the Possibility of Its Functional Improvement after the Closed Fractures of the Patella

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Abstract

Relevance. The patellar fractures are relatively rare. Their clinical significance is associated with the fact that they can cause the development of severe patellofemoral pain syndrome. Lateral retinaculum release was introduced into clinical practice in 1970s for treating this syndrome and since was widely used. The biomechanical validity of this operation has been proven experimentally, but the role of lateral release in the prevention of patellofemoral arthritis progression and concomitant pain after patellar fractures remains poorly understood.

The purpose of the study was to improve the results of the patellar fractures surgery by combining osteosynthesis with lateral retinaculum release.

Materials and Methods. This was a non-randomized, cohort, open-label prospective study with retrospective control. The treatment results of the patients with closed patellar fractures were analyzed. The prospective group ($n = 45$) was formed sequentially during 2018–2019. The retrospective control group ($n = 41$) was selected from the database of the city center of traumatology according to the inclusion criteria. The difference between both groups was that in the patients of the prospective group, open osteosynthesis of the patella with wire segments and a stretching wire loop was combined with minimally invasive release of the lateral retinaculum. The function of the operated knee joint was assessed in 12 months after the surgery by the KOOS. The magnitude of the patellar articular surface discongruence was measured by X-rays; the stage of patellofemoral arthritis was classified by Iwano. The statistical analysis included the calculation of medians, means, absence/presence differences in groups indicators, correlation analysis of the measured variables.

Results. The comparing groups were heterogeneous in gender, age, and types of fractures: the prospective group comprised 18 women (49.7 ± 14.7 years), 27 men (45.1 ± 11.2 years), the retrospective — 13 women (50.2 ± 12.3 years), 28 men (41.9 ± 10.7 years). In the prospective group, compared with retrospective, the 34-C1, 34-C2 fractures were prevailed. The null hypothesis about the equality of KOOS indicators and the stage of patellofemoral arthritis in both groups was rejected at the $p < 0.05$ significance level. The patients of the prospective group had better KOOS indicators. The Spearman's correlation analysis revealed a positive relationship between KOOS scores in the range 0.26 to 0.41 and a negative correlation between the stage of arthritis (-0.29) and lateral release.

Conclusion. Testing the null hypothesis that there was no difference between the KOOS scores between the prospective and control groups confirmed its inconsistency. The beneficial effect of lateral release on the knee function was demonstrated in the mid-term results of the patellar fractures osteosynthesis.

Keywords: patellofemoral arthritis, patellar fractures, KOOS, lateral release.

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