

Abstract

The paper presents the development of instrumentaria designed to solve ACL lesions using hamstrings (tendons of semitendinosus and m. gracilis – ST / G). The work itself took place in two phases. Part of the first phase was the development of its own instrumentation, including the implant designed to fix hamstrings tendons. The inherent part of the development was the performance of both mechanical and functional tests. The most tested element of the instrumentation was the screw with eye. In the course of its development, mechanical tests of tensile strength were carried out on the individual variants of the solution, and then the rapture of the screw with the eye from animal bone – simulating the function of the product in a real environment. Part of this was the development of methodology and work with new instrumentation. Clinical testing was performed in the second stage and the results of the operations are part of the work. The self-developed ACL lesion reconstruction toolkit is designed to use a graft made up of four strands of the above tendons.

In the experimental part of the instrumentation development, the suitability of the implant for clinical use has been demonstrated. The newly developed instrumentation for ACL reconstruction, using the test implant for fixation of the hamstrings tendons, has proven to be convenient and easy to operate, ensuring logical continuity of surgical steps that minimizes operational errors. 58 patients were enrolled in the clinical part, 9 of them were men and 49 were women. The average age of patients was 34.6 years. Patient evaluation was performed before and after surgery. Clinical trial results showed improvement in the status in all patients compared to preoperative status. All patients showed a significant improvement in knee joint stability, restoration of the range of motion and improvement in IKDC subjective assessment, as well as in the VAS score.