Advancements in arthroscopic treatment of ankle pathology: insights from our clinical experience

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Abstract: Ankle and foot injuries are prevalent musculoskeletal pathologies, comprising a significant portion of cases reported in both foreign and Russian literature. Arthroscopic examinations have emerged as a high-level medical technology, offering minimally invasive interventions with excellent diagnostic capabilities for joint injuries and diseases. This study aimed to enhance the diagnosis of ankle joint pathology by employing a combination of advanced research methods, including X-ray, MRI, MSCT, and arthroscopy. The article discusses the diagnostic capabilities of each method, highlighting their specific contributions to identifying various ankle joint conditions such as fractures, osteoarthritis, soft tissue injuries, and chronic instability. The study conducted arthroscopic interventions on 16 patients, focusing on therapeutic measures such as microfracturing, chondroplasty, osteophyte removal, impingement syndrome treatment, and ligament reconstruction. The postoperative outcomes were evaluated using a modified scale for assessing ankle joint function, showing a significant improvement in functional capabilities and pain reduction. The article concludes that arthroscopic intervention in the ankle joint is a technologically advanced, minimally invasive procedure that enables early rehabilitation initiation, reduces hospital stays, and accelerates patient recovery compared to open interventions.

Keywords: ankle joint, foot injuries, musculoskeletal pathologies, arthroscopy, diagnostic methods, X-ray, MRI, MSCT, minimally invasive interventions, therapeutic measures, functional assessment, rehabilitation, patient recovery

Introduction. Ankle and foot injuries comprise a significant portion, ranging from 6% to 21%, of musculoskeletal pathologies according to both foreign and Russian literature. Arthroscopic examinations, as minimally invasive interventions with excellent diagnostic capabilities, represent a high-level medical technology that allows for informed decision-making in cases with unclear clinical presentations of joint injuries and diseases. To enhance the diagnosis of ankle joint pathology, a combination of advanced research methods such as X-ray, MRI, MSCT, and

arthroscopy have been employed. X-ray diagnosis provides limited information but can help identify ruptures of the tibiofibular syndesmosis, intra-articular fractures, and signs of deforming osteoarthritis. Computed tomography (MSCT) aids in determining the size of marginal bone growths and clarifying the presence and size of free bone bodies. Magnetic resonance imaging (MRI), known as the gold standard for soft tissue pathologies and injuries, enables comprehensive assessment of pathological changes in both soft tissues and bone structures. MRI can also identify damage to articular cartilage, chondromalacia, and exclude other pathological conditions causing chronic ankle joint pain, such as tarsal sinus syndrome, aseptic necrosis, tendon injuries, hidden fractures, and stress fractures. Diagnostic arthroscopy exhibits 100% sensitivity and specificity in diagnosing damage to the capsule-ligamentous apparatus. Furthermore, it is effective in detecting osteochondral fractures and chondromal bodies.

Materials and methods

We performed arthroscopy on 16 patients (9 women and 7 men) with ankle joint pathology. All patients were of working age, with an average age of 36 years (ranging from 20 to 58 years). The indications for surgery were as follows: osteochondropathy of the talus bone in 2 patients (12.5%), osteoarthritis with bone impingement in 4 patients (25.0%), anterior soft tissue impingement syndrome in 4 patients (25.0%), chronic lateral instability in 2 patients (12.5%), and osteochondral fractures in 4 patients (25.0%).

Arthroscopy was performed using standard anteromedial and anterolateral ports. Therapeutic measures included the removal of free chondromal bodies and microfracturing (osteoperforation) in 2 patients, abrasive chondroplasty, osteophyte removal, and microfracturing in 4 patients, and elimination of anteromedial impingement using an arthrosaver and an ablator in 4 patients. Two patients with chronic lateral instability underwent autografting of the external collateral ligament using the tendon of the peroneus brevis muscle. The autograft was fixed with a TWINFIX Ultra HA 4.5 mm suture anchor. In the early postoperative period, ice therapy was used, except for the two patients with chronic lateral instability who did not require plaster immobilization. The day after the operation, physical therapy involving active movements without load was initiated, and walking with crutches with non-weight-bearing on the leg was permitted. Patients were discharged for outpatient treatment on the 3rd or 4th day. Patients who underwent autografting of the external collateral ligament wore a plaster cast for 2 weeks and then started active ankle joint development. Weight-bearing was allowed 3 weeks after the operation. Patients who underwent microfracturing were advised to use crutches for up to 2 weeks after the procedure.

Results: To evaluate the treatment outcomes, a modified scale for assessing ankle joint function (D.D. Cherkesade et al., 1999) was utilized. This evaluation scale consists of 10 parameters that enable an objective assessment of biomechanical factors characterizing the functional capabilities of the ankle joint. According to this scale, scores ranging from 45 to 50 indicate excellent function, scores from 39 to 44 indicate good function, scores from 31 to 38 indicate satisfactory function, and scores below 30 indicate unsatisfactory function. The results were obtained through pre-surgery questioning and follow-up assessments conducted 6 to 12 months after the operation.

The data obtained indicate a significant improvement in the average ankle joint function scores, increasing from 33.6 points before surgery to 45.5 points during the follow-up period. Pain in the ankle joint either disappeared or significantly decreased, lameness subsided, the distance patients could cover increased, and joint mobility improved. These improvements were less pronounced in terms of paraarticular tissue trophism and the use of supportive means. The results of arthroscopic treatment corresponded to the size and stage of chondromalacia observed during ankle joint arthroscopy.

Only one patient (6.2%) experienced a complication in the form of altered skin sensitivity in the area innervated by the dorsalis intermedius branch of the cutaneous nerve, which was associated with the lateral approach.

Conclusion

Arthroscopic intervention in the ankle joint is a technologically advanced, minimally invasive therapeutic and diagnostic procedure that requires specialized surgeon training, meticulous handling of anatomical structures, and the utilization of modern endoscopic equipment and tools. The use of arthroscopic surgery enables earlier initiation of rehabilitation treatment in the postoperative period compared to open interventions, reduces the duration of inpatient stays, and accelerates patient recovery.

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