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CURRENT UNDERSTANDING OF THE TREATMENT OF PATIENTS WITH INJURIES OF THE INTERTROCHANTERIC SYNDESMOSIS (LITERATURE REVIEW)

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Abstract:

Treatment of patients with ankle fractures with rupture of the intertibial syndesmosis is an unsolved problem of modern traumatology. The classification and history of the development of conservative and surgical treatment of ankle joint injuries with a detailed analysis of the designs, types, and complications of their use are presented.

Keywords: Ankle Joint, Intertibial Syndesmosis, Submerged Osteosynthesis, External Fixation Device

RELEVANCE:

One of the most frequent pathologies in the practice of an orthopedic traumatology is ankle joint (ATJ) damage, which accounts for up to 20% of musculoskeletal system injuries. According to statistics, the incidence of ankle fractures averages 100-120 per 200,000 people per year. Between 54.1% and 84.6% of ankle fractures with MBS tears occur in the young and able-bodied population [1-3]. Despite the fact that modern traumatology has a large arsenal of treatment options for patients with ankle fractures accompanied by an intertibial syndesmosis (IBS) tear, the treatment outcomes for this category of patients range from 3.0 to 53, In this category of patients, outcomes include ankle joint contractures, fractures of the ankle, false joints, chronic subluxation of the talus with diastasis between the tibia bones in the MBS region, and deforming arthrosis of the damaged SSF [4-6**].** In order to establish a clear approach to treatment, all

fractures of the ankle are divided into stable and unstable fractures. The ankle fork is conventionally thought of as a ring consisting of three bones and their connecting ligaments. Since these ligaments are almost inextensible, a single injury to the ring, such as an isolated fracture of the external ankle, which accounts for up to 85% of ankle fractures, cannot cause anteroposterior, or lateral, displacement of the talus and is therefore stable [5-6]. According to several authors, a ring injury in two places, which can be represented by either fracture of both ankles, or a fracture of one ankle and a tear of one of the ligament groups, is unstable and accounts for 15% of ankle fractures. This group also includes all double and triple ankle fractures, taking into account that ligament fractures are equivalent to (often more severe) ankle fractures. Conservative treatment of patients with ankle fractures accompanied by a ruptured MBS has an unsatisfactory outcome of 6.6% to 23.4%. This is due to the fact that after manual closed ankle fracture repositioning and external fixation with plaster or polymeric bandages, fragment displacement and diastasis between the tibia bones in the MBS region often persist [7-9].

K.V. Shevyrev (2004) notes that of all patients with ankle fractures treated conservatively and requiring reconstructive surgery in the HSS region, 58% of patients had a history of ankle fractures with a tear of the intertibial syndesmosis. The frequency of unsatisfactory results after surgical treatment of ankle fractures with a ruptured MBS ranges from 4.8% to 19.3% [10-11]. Fixation of the syndesmosis with "rigid" or "elastic" immersed structures that bind the tibia bones in the MBS region often leads to strong compression of the talus block between the tibia bones, which limits the movement of the talus in the "fork" of the MSS and provokes the development of osteoarthritis in the damaged MSS and pain syndrome [12-13]. Domestic and foreign authors believe that after surgical treatment of ankle fractures with ruptured MBS, diastasis between the tibia bones in MBS cannot be eliminated in 24 to 52% of cases; the

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need for repeated surgery occurs in 2.1 to 20% of cases [14-16].

Analysis of the incidence of first-time disabilities following ankle fractures has shown that patients with an MBS tear dominate among them, ranging from 3.1% to 36.7% [17-18]. The variety of ankle injuries has led to the creation of multiple classifications. Current classifications of ankle fractures can be divided into three main groups.

1. Classifications based on anatomical features of ankle injuries. A distinction is made between single ankle fractures (fracture of the inner or outer ankle), double ankle and triple ankle fractures [19].

2. Classification based on the mechanism of injury. A distinction is made between abduction (pronation), adduction (supination) and rotation (eversion and inversion) ankle fractures. A common disadvantage of classifications based on the mechanism of injury is that the terms describing the movement of the foot are ambiguous and treatment tactics cannot be determined [20].

3Classifications based on the severity of the fracture. These classifications take into account the level of the fibula fracture and the stability of the ankle joint [21]. A retrospective review of the available literature shows that the study of MBS injuries that complicate the course of ankle fractures is one of the most important issues in the diagnosis and treatment of SSF fractures. This is evidenced by the creation of classifications of MBS injuries by various authors.

Khoroshkov S.N. (2006) notes that the nature of MBS damage in ankle fractures may be ligamentous, bone-ligamentous and bone-ligamentous. In our work, we applied the AO/ASIF classification, adopted by the SICOT Congress in Montreal in 1990 as an international classification. Three types of ankle fractures are marked with the letters A, B, C: each type is subdivided into three groups. Each group is divided into three subgroups, marked with the numbers 1, 2, 3. Ankle fractures are classified in order of increasing severity of fracture, difficulty of treatment, and prognosis. Ankle fractures with a ruptured MBS are classified as type C.

Conservative treatment. The main advantages of conservative treatment of patients with ankle fractures with plaster or polymeric bandages are their affordability, technical accessibility, ease of application and patient mobility. The methods of closed ankle fracture repositioning do not require invasive intervention, indirect manual or apparatus ankle fracture repositioning is performed without damaging the skin and soft tissues, the blood circulation is preserved not only soft tissues, but also the bone fractures, and the risk of infectious complications is minimal. The risk of infectious complications is minimal.

Some authors suggest manual repositioning with a plaster cast immediately upon admission to the hospital or a trauma centre, despite the development of post-traumatic edema [22-23]. In their opinion, this is due to the fact that there is no muscle retraction in the first hours after trauma, which allows the fractures to be placed without significant physical effort, and accurate repositioning of the fractures of the injured limb segment helps the early recession of post-traumatic edema.

Others insist on a delayed plaster cast after the post-traumatic edema subsides, arguing that it is easier and better performed on a non-traumatic limb [24-25].

V.V. Kliuchevskii and Y.A. Filimendikov (2002) promote the method of delayed ankle fracture repositioning. After elimination of foot dislocations, a tubular mesh bandage is placed on the injured limb up to the middle third of the femur. The mesh bandage is knotted at the toe tips and the leg is suspended from the Balkan frame on a spring. The thigh is placed on the Böhler splint, while the foot and lower leg remain suspended. In the suspended position of the foot and tibia, after dislocation or subluxation of the talus, there is still the possibility of active movements in the injured HSS, which improves microcirculation and lymphatic drainage of the injured limb [26]. After the post-traumatic edema subsides, after 5-6 days final repositioning of the ankle fractures with the application of

The final ankle fracture repositioning is performed 5-6 days later. This technique reduced secondary fragment displacement to 1.72%, but a significant disadvantage is the need for forced bed rest.

Many authors prefer a U-shaped plaster cast up to the upper third of the tibia [27], with replacement by a circular plaster cast "bootstrap" once the swelling has decreased. The plaster cast fixating the knee joint is considered by the authors to be more reliable for the prevention of secondary dislocation. Because flexion of the knee joint to 110 reduces the tension of the shin muscles involved in the Achilles tendon formation. After 3-4 weeks, the bandage is shortened to the knee joint [28]. Inaccurate ankle fracture repositioning in 6-17.8% of cases results in incorrect ankle fracture fusion and in 2.1% to 11% of cases a false inner ankle joint [29].

Surgical treatment. Currently, surgical treatment of ankle fractures with MBS tears is the

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priority method. A large number of metal fixators of various designs have been developed and introduced into practical health care for osteosynthesis of fractures in the ankle joint area. According to Russian researchers, the frequency of surgical treatment of ankle fractures with MBS tears ranges from 39.1 to 63.1 % of patients .

M. Gris et al. (2005) used U-shaped steel braces for osteosynthesis of medial ankle fracture. In the treatment of deltoid ligament injuries, there are papers in the literature that reflect diametrically opposite opinions. Thus, according to [31], a deltoid ligament rupture does not require surgical repair unless the injured ligament interposes into the medial articular cleft of the HSS.

Rajabov A.A. and Baimagambetov Sh.A. (2006) consider restoration of the damaged deltoid ligament to be a mandatory stage of surgical treatment. R.S. Titov (2008) recommends the use of a wire loop to increase the strength of fixation in osteosynthesis of medial ankle fractures with spokes.

A.B. Kazantsev et al. (2008) and P.P. Chekeres (2010) in the course of clinical research they revealed a significant worsening of the outcomes of surgical treatment in the group of patients in which the deltoid ligament was not sutured. For fixation of suprasindesmosis fractures of the fibula in ankle fractures with ruptured MBS, in most cases, plate osteosynthesis is used. Most researchers do not recommend open reduction and osteosynthesis of a suprasindesmosis fracture of the fibula in the upper third because of the risk of intraoperative damage to the peroneal nerve and its involvement in the postoperative scar. Stabilization of the HSS fork in this case can only be achieved by inserting a positioning screw at the level of the MBS.

Kuvin (2002) used pigtail lavsan threads to stabilize the MBS. A drill was used to form three channels in the fibula and tibia, through which the lavsan "pigtail" was passed and fixed with biopolymer pins. The intertibial diastasis was eliminated using the author's intertibial syndesmosis reponator over the MBS. In recent years, surgical treatment of ankle fractures with a ruptured MBS has been widely used to stabilize the MBS with a positioning screw. Some authors use a cortical screw with a diameter of 3.5 mm and others 4.5 mm as a positioning screw .

Currently, more than 50 modifications of external fixation devices (AVF) are used abroad and in our country. The method developed by G.A. Ilizarov and his pupils in 1951 has gained worldwide recognition. It was the method of repositioning and fixation of the tibia bones in case of AMF injuries with the help of spokes with a thrust platform, passed through the tibia bones at the level of AMF, that was published by G. A. Ilizarov in 1972. The accumulated extensive experience with the use of compression-distraction apparatuses using spokes shows that this method has a number of significant advantages. However, some authors, while emphasising the positive aspects and high effectiveness of the apparatuses, point out complications as a result of this method. In particular, when studying the results of treatment of patients with ankle fractures, the scientist identified the following types of complications associated with the use of pins: skin breakdown at the entry and exit points of the pins; inflammation of soft tissues around long pins associated with the formation of a channel around their entry and exit points, which serve as a gateway for microbial contamination. The percentage of such complications, according to the Kurgan Research Institute of Experimental and Clinical Orthopaedics and Traumatology, is 29.1% of patients. At the same time, suppuration of soft tissues in the area of the spokes was noted in 13.6-21.3 % of cases. Osteomyelitis in the area of the pins also occurs in 2.7-6.4% of cases, bleeding from wound channels around the pins in 3.5-4% of cases, as well as pain syndrome, persistent oedema, and internal organ pathology resulting from nerve damage and receptors. Some authors attribute these complications to damage and irritation of biologically active points. Despite the advances in medical science in recent decades and the introduction of various new technologies in traumatology, patients with ankle fractures with MBS tears often have unsatisfactory treatment outcomes, often leading to disability. This causes significant economic damage to society, making the problem medically and socially relevant.

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