The Annals of the "Ştefan cel Mare" University of Suceava.
Physical Education and Sport Section. The Science and Art of Movement
eISSN 2601 - 341X, ISSN 1844-9131

METATARSAL FRACTURE AT THE AGE OF PRESENESCENCE ANALYSIS AND CONSIDERATIONS

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Keywords: presenescence, fracture, medical recovery, analysis, pathophysiology.

Abstract: The presented study is based on an analysis of the pathophysiologic factors of metatarsal fracture in patients over the age of presenescence, i.e. 50 years. We consider that the mechanisms of its production as well as its reduction present specific aspects for study. The fact that people with fractures of the lower limb are functionally limited in terms of locomotion requires a punctual analysis of all the elements that make up the clinical picture of the posttraumatic patient. Through the proposed approach we aim to identify and analyze the factors that may hinder the process of callus healing at the level of the focus, as well as the elements that may facilitate and optimize the recovery process.

Introduction:

The metatarsals are bones that are part of the structure of the ball of the foot, located in front of the tarsals, which together form the arch of the foot, and behind the phalanges of the toes. There are five of these bones, and a metatarsal fracture is a break or crack in one of them.

Fig.1 bones of the leg [7, 12]

Metatarsal fracture in the elderly has a fairly high incidence due to the fact that the proprioceptive capacity is decreasing, the distributive attention is low and the motor potential in the anasambulus has a slow involution dynamics due to physiological factors accompanying the senescence process.

Fractures of the metatarsal bones are among the most common foot conditions, along with phalangeal fractures. They occur equally in adults, both men and women, as well as children. Fractures of the fifth metatarsal are common in

adults, and the third metatarsal is associated in 68% of cases with multiple fractures (of the second and fourth metatarsals). [1, 13]

The main causes of metatarsal fractures are trauma by direct or indirect mechanism.[11] Direct injuries are caused by hitting the foot with a heavy or bulky object and are common in accidents at work, when they are associated with soft tissue injuries. Indirect trauma fractures are caused by overstress, twisting movements with the forefoot fixed. Supination (48%), fall from height (26%) and crushing (12%) injuries occur in the following percentages.

A special situation is a metatarsal fracture occurring in the context of minimal effort, on an altered, aged, osteoporotic bone structure. Or against a background of chronic joint inflammation, as well as on a joint with reduced or lost sensitivity.

Metatarsal fracture - risk factors:

- The metatarsal bones provide support when walking by helping to distribute the weight of the body evenly across the sole of the foot. They are therefore put under stress with every step taken, and in athletes this stress is greater. Thus, a primary risk factor for metatarsal fracture is the practice of sports such as running, basketball, football, long or high jumping;
- At the same time, prolonged or strenuous activities, such as walking or standing, cause the muscles of the foot to stop absorbing shocks effectively, which can lead to a metatarsal fracture;
- Working on construction sites, on extraction platforms or in workshops or halls where heavy objects are handled carries a higher risk of accidents that can cause metatarsal fracture;
- Wearing inappropriate footwear, which does not provide sufficient support and alters gait, is another risk factor, especially for women who frequently wear high heels;
- The list of risk factors for metatarsal fracture is completed by old age and certain diseases that affect bone strength.[14]

Clinical examination is essential in establishing the diagnosis of metatarsal fractures. Local assessment, inspection, looks for: alignment of the foot, tenderness (local or diffuse), soft tissue appearance, degree of mobility and neurological status testing.

Acute fracture of the metatarsal usually presents with pain, edema, ecchymosis and difficulty walking. Applying tension to the fractured metatarsal produces pain at the site of the fracture.[10]

The position of the fracture can be assessed by two images at a 90° angle to each other. The modified oblique or modified lateral image is often more useful.

Fracture lines may not be visible on the initial radiographs. In this case, clinical examination and radiographs should be repeated one to two weeks after the initial injury. If necessary, the doctor may also order MRI scans if stress fractures are suspected.

When the history is typical and the clinical examination conclusive, the orthopaedic surgeon makes a presumptive clinical diagnosis.

Treatment for a metatarsal fracture depends on the severity and location of the fracture. In mild cases, for minor fractures, treatment often consists of immobilizing the foot with a splint or cast to allow the bones to heal.

The RICE treatment regimen (rest, ice, compression and elevation) can be effective in managing symptoms. The RICE method is a self-care protocol used to reduce pain and swelling after an injury, often recommended in the first 24-48 hours after an injury. RICE involves:

- limiting use and movement of the injured area;
- applying ice packs to the injured area for short periods of time;
- use of an elastic bandage or compression bandage;
- raising the injured area above the level of the heart. [9]

Treatment: as with metatarsal I, the emphasis is on the final position of the metatarsal head. The most commonly used criteria in this case is that any dorso-plantar deviation greater than 10^0 and any translation greater than 3-4 mm should be corrected.

The majority of metatarsal fractures can be treated orthopedically with a gambieropodal plaster cast appliance with partial-supported gait.

Surgical treatment consists of internal fixation with Kirschner screws or screw plates in transverse or comminuted fractures.

Fractures of the first metatarsal are difficult to keep reduced after closed reduction due to traction of the intrinsic and extrinsic muscles and therefore usually require internal fixation.[2]

Metatarsal fractures are relatively common and, if malconsolidated, are a frequent source of pain and disability.[8]

Fig. 2 Fracture with metatarsal displacement 1. with Kirschner brosis displacement [15]

Aim and objectives of the study:

Aim of the work: argumentation of the analysis of the pathophysiological factors that are found in the clinical status of metatarsal fracture recovery.

Research objectives:

- analysis of the specialized literature regarding of the metatarsal fracture;
- identifying and understanding the pathophysiological mechanisms leading to metatarsal fracture recovery;
- the realization of a therapeutic pathway metatarsal fracture recovery.

Materials and methods: In order to understand the pathophysiologic mechanisms and the physiotherapeutic approach to metatarsal fracture recovery in senescent individuals, we present a case study specific to this traumatic conflict. A 61-year-old person suffers a trauma to the left foot localized to metatarsal bone 1. (by falling a weight over the foot). Even though the patient complains of pain and functional incapacity he does not go to the doctor on the first day and treats the incident on his own. The next day he goes to the hospital, where after an X-ray a displaced metatarsal 1 fracture with displacement is found. No X-ray. It is considered that the fracture does not need to be reduced by surgery and the foot is immobilized in orthopedic casts for 8 weeks after which a control radiograph is taken fig. 3 A vicious, incomplete callus can be seen with the possibility of possible complications.

The patient complains of pain, functional incapacity and resumes walking with crutches. What is worse is that the patient does not benefit from medical assistance and recovery. After another 8 weeks the patient presents to the physiotherapy office with a reduced functional status, limping gait, edematous and

painful tissue, reduced exercise capacity. A control radiograph is recommended fig. 4 is performed and a recovery program is started with the following objectives: reduction of pain and edema, increase in joint mobility, increase in muscle tone in the affected limb and stabilization of proprioceptive capacities, respectively, recovery of gait and effort capacity.[5]

Fig.3 Fracture with metatarsal displacement 1. with displacement

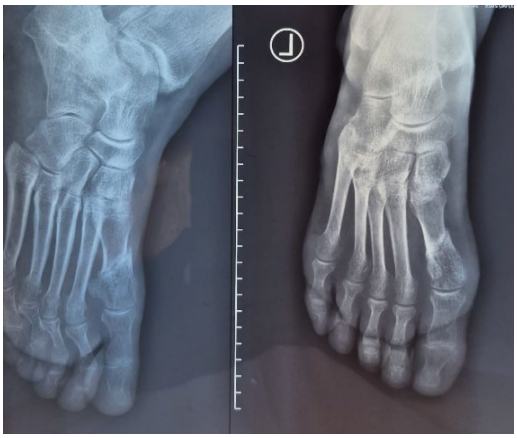

Fig.4 Fracture with metatarsal displacement 1. viciously reinforced

The patient responds to the treatment in such a way that after 2 weeks of recovery she is able to walk without support and is able to perform physical activities safely. However, the recovery program is continued for a period of 2 weeks to consolidate the functional status and to increase the effort capacity.

Results and discussions: Therefore, after the findings of the analysis of all the factors that were included in the patient's therapeutic path, we will present some aspects that were determinant in the economy of the recovery program.

According to the current practice and the studies carried out so far, the approach to metatarsal fracture with displacement, its reduction is performed with osteosynthesis material. The factors leading to this practice are specific to orthopedic-trauma surgery.

The clinical picture of the senescent patient shows age-specific vulnerabilities and comorbidities, which slow down and slow the dynamics of the calcification process.[6]

Lack of medical care, monitoring and timely initiation of rehabilitation programs can lead to the onset of osteo-articular and functional complications, often followed by a sequelae status. [3, 4]

Conclusions:

- The reduction of displaced metatarsal fracture with displacement should be accomplished by surgical approach;
- The medical recovery program as well as training in the direction of prevention is determinant in completing the recovery.
- Medical follow-up by performing an Rgf. imaging investigation is mandatory in order to prevent the onset of possible complications.

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