Introduction: Despite enormous number of publications on classifications and treatment of ankle fractures, this problem remains actual till present days. Never the less, the ultimate goal remains the same – anatomically correct position of articular surfaces, painless and stable ankle joint. Material and methods: Through prospective study we processed over 50 patients from policlinic data of Orthopedic – Traumatology ward in Cantonal Hospital Zenica. Research lasted over one year and we collected tremendous data from patients which filled in surveys. These data were processed and presented in this study. From collected data we determined statistical incidence of so called ´overseen´ and poorly treated injuries of lateral ligaments, origin and mechanism of injuries, number of previous injuries of same nature and then compared with data on treatment method, whether conservative or operative. Results and discussion: We paid special attention and presented findings on age and gender groups that are most involved in ankle injuries. We’ve confirmed that RTG-Varus stress test is still the method of choice in diagnostics of ankle lateral ligaments injuries. We also determined how treatment duration correlates to time between injury and check in, number of recidivism and most importantly correlation between duration of symptoms and length of immobilization and physical therapy duration. We appeal to our colleagues to approach these injuries with higher level of interest and methodically during diagnosis and therapy because every oversight leads to increased risk of repeated injury, chronic instability of ankle joint, cartilage damage and progression of arthritic joint changes. All of those factors greatly impairs patient’s life quality. Competent and quality examination will determine, with more accuracy, degree of injury and set basis for adequate therapy which will not leave any consequences for the patient. That would provide him to continue with normal everyday activities. Key words: distortion, diagnosis, treatment, consequences.

1. INTRODUCTION

Percival Pott (1768) gave one of the first classification of ankle injuries. French school gives special importance to the ankle injuries. Dupuytren (1819) and Maisonnewe (1840) were stand out among others. They gave special attention to the fractures in ankle region, by making their classification and giving treatment recommendation. Modern era in research and ankle treatment starts with Switzerland orthopedist Bernard G Weber (1927-2002). He lived and worked in Zurich (Klinik Balgrist), Bern (Inselspital) and St. Galen (Canton Spital). His experimental and critical work was pointed to ankle injuries (upper ankle). He has followed and research distortions, bone fractures – bones that are involved in ankle (maleolar fracture and pilon tibia fractures), open fractures etc. His doctoral thesis was committed to the upper ankle injuries. “Die Verletzungen Des Oberen Sprunggelenkess” was published by him in 19. Century where the ankle injuries and their biomechanics, character, classification and treatment were brilliant demonstrated. His instructions, especially injuries classification, are leading in today’s traumatology.

Ankle joint have his upper and lower part. Upper ankle joint is consist of articulations surfaces and lower tibia metaphysis and articulations surfaces of tibia and fibula maleolus. Upper ankle joint is an example of articulation gyn-glymus. Lower ankle joint is made from articulations surfaces of ankle and calcaneus.

Joint is surrounded by joint capsule and strengthen by external confections (ligg. Fibulotalare anterius, lig., talocalcaneare, lig. fibulotalare posterior), deltoideus ligaments comes from medial side in two layers (superficial and deep). Achilles tendon from behind and extensors apparatus from the front gives indirect support to the joint.

1.1. Classification

There are various classifications of joint injuries.

Lange – Hansen classification is dominant in Anglo-Saxon literature, AO (Switzerland) Weber’s classifica-
Ankle Distorsion is dominant today and it is based on biomechanical very important calf fracture and its relation toward tibiofibular anastomosis.

Classification:
- Calf fracture below indicated syndesmosis;
- Calf fracture in the level of syndesmosis;
- Calf fracture below syndesmosis.

Distortion definition:
- Distortion sprain.
- Latin: distorquere—sprain

During the specific ankle joint position when force overcome joint stability, displacement of articulations surfaces occurs because of the soft tissues pressure in first layer of capsule and ligaments. 80% of this injuries occur during the foot torsion toward inside. 10-30% all sport injuries are luxation, 40% of persons who had suffer luxation become exposed to the possibility of developing chronically difficulties.

1.2. Injuries Etiology

Ankle joint injuries can occur during walk, work or sport activities, etc.

According to the analysis in USA annually 1-10 million persons suffer from distortion, and it is a 20% of all injuries in USA. 50% of persons who suffer distortion have consequences according to the American studies. 85% ankle joint injuries are sprained ankle, it is estimated that every day 25 000 persons suffer from sprained ankle. Most common ankle joint injuries are lateral inversion injuries.

English sources are saying that frequency of ankle joint injuries is 52.7 patients on 100 000 patients on 100 000 patients.

1.3. Age and sex

Female athletes have more frequent ankle joint injury for 25% than males.

Some studies are saying that the ankle sprained is more common in high school sport. It is noticed that sport injuries happens more often during competition than during the training. Fractures, tendon injuries and ligament injuries are more common at elder persons.

2. CLINICAL PRESENTATION

Sprained ankle is a kind of injury (most common in sport after the knee injury) which affects one or both ligaments that are places on outer and inner side of ankle joint. It may occur during the stretching or tearing of ligament from inner to the outer side of ankle. It occurs in every type of sport. This condition is followed by pain, swelling, changing skin color on outer part and also often on inner side of ankle joint. Patient has walking difficulties. Swelling can last for months. During the evening hours it is getting worse because the damaged ligaments cannot take their natural form.

Foot can be twisted, inverted, moved forward or backward, rotate in bigger or lower range, but it is important to know how much is ligament of foot ankle ruptured. Fractures of foot maleolus are also included in this group of injuries.

Internal foot rotation or torsion can lead to tension of: anterior tibiofibular ligament, anterior fibulotalar ligament and fibulocalcaneal ligament. Ligaments rupture is most often during the internal rotation and most common on anterior fibulotalar ligament, fibulocalcaneal ligament and anterior tibiofibular ligament. Drawers sign can be positive if it’s anterior tibiofibular and fibulotalar ligament ruptured and the foot can be moved forward. Foot can be twisted over the physiological border if it’s fibulocalcaneal ligament cracked.

During the external rotation when the foot is in the neutral position or dorsal curved due external rotation and foot torsion, tension of tibiofibular ligament can occur. If the rotation is continued tension of ligament deltoideum can occur its anterior part (pars tibiotalaris) and pars tibionavicularis. During the maximal planter foot flexion along with the external rotation can lead to fibulotalar ligament cracking, often with fibulocalcaneal ligament also, and it lead to the talus luxation. This type of injury is very rare. Injuries of fibulotalar and fibulocalcaneal ligaments that occur as a result of supination adduction are more common. Injuries of joint capsule, synovial membrane and bone fragments can be found.
with medial side because of the anatomy of bones and soft tissues. Distal part of fibula (lateral maleolus) is inferior and it is longer than the distal part of tibia. Length discrepancy gives medial joint stability improving bone resistance toward eversion.

Medial joint ligaments known as a deltoid ligament complex are forming wide, strong ligament stability in prevention of eversion and secured stability of medial joint in that way.

Lateral side have just minimal bone stability which is provided by three small ligaments (ATFL, CFL i PTFL.).

2.1. Diagnosis
Diagnosis is made by physical examination and X-ray.
Physical examination includes:
• Joint inspection (swelling, deformity, laceration, ecchymosed);
• Palpation (pain, crepitation!);
• Neurovascular exam;
• Joint stability.
  • Drawer test (check of lateral ligament stability);
  • Talar tilt test (stability estimation).

Radiographic Examination
• Standard AP and joint profile;
• Ultrasound examination of soft tissue around the joint.
• Stress images (varus and valgus);
• MRI and CT - becoming standard at distortions of harder degree.

2.2. Aims
• Reveal and research:
• Errors during the diagnostics of distortion as an injury;
• Errors in treatment of ankle joint.
• Number of patients with chronic difficulties.
• Number of distortions recidivism as a consequences of errors during diagnostic and treatment.

3. MEHTODS
Prospective study process 50 patients in Orthopedic – traumatology ward policlinic at Cantonal Hospital Zonica. Special attention is made on discovering and analysis of errors in diagnostic, treatment, occurrence of chronic difficulties, number of distortion recidivism.

It is followed:
• Time from injury until the first examination;
• Age groups and patients sex;
• Types of treatment;
• Earlier injuries;
• The dependence of consequences from type and length of treatment;
• Statistical evidence of errors caused by bad treatments of external ligaments in ankle joint.

4. RESULTS
Results of our research are presented by tables and graphs. In our sample was 27% females and 23% males divided into three groups (Figure 5).

• 13 of 50 patients have anterior fibulotalar ligament injury, from that number 1 patient with an injury of 2 ligaments. (Talar Filt higher than 13°);
• 38 patients came to examination at the first day of injury or the day after;
• 10 patients came to examination in period of 2-7 days later;
• 2 patients came to examination 7 days or more after the injury has occurred.

Types of treatment:
• Bandage
• Splints + bandage
• Splints + after full gypsum
• Operative treatment

Etiology:
16 of 50 patients had an earlier injury – distortion of injured ankle joint.

Treatment type:
Length of physiotherapy:
• 43 patients had physiotherapy treatments.
• 29 patients has been 2 to 4 weeks on physiotherapy;
• 14 patients had physiotherapy longer than one month.

Relations of consequences upon the immobilization and the physiotherapy length.

Hypothesis is that there is significant relation between the swelling and the applied treatment type. Hypothesis was tested by Hi – square test. Hi square test values at the level of significance a = 0.05 is bigger than the theoretical values $X^2 = 22.42 > 12.59$, because of that zero hypothesis (that there is not significant relations) is discarded, there is dependence between the swelling and the applied treatment type.

So we can say that frequency of swelling appearance is dependent on the type of applied treatment at patients with an injury of ankle joint.

Dependence on the length and type of treatment.

Figure 5. Age of patients

Figure 6. Injury etiology

Figure 7. Treatment type.
Hypothesis is set that the presence of pain after the treatment is dependence of the treatment type. Hypothesis is tested by $X^2$. Estimated value at the significance level $a=0.05$ is bigger than theoretical value $X^2=15.277$ so the zero hypothesis is discarded. Fre-
quency of pain occurrence is depended on the treatment type.

**Dependence of joint instability and treatment type.**

Hypothesis is that there is no statistical significance between instability of ankle joint and the treatment type. Hypothesis is tested with $X^2$ test and on a significance level $a=0.05$ shwon that $X^2 =34.05$ what is bigger than theoretical values. Occurrence frequency of Ankle joint instability is dependent on the type of treatment. 13 of 50 patients had recidivism on injured ankle.

5. DISCUSSION

Considering diagnostic, treatment and consequences it's noticed that dis-
tortion as an injury is often underestimated. Patients often do not take this injury seriously, they refuse gypsum immobilization and do not conduct advised treatments. Consequences are often. We have noticed that patients looks for doctor advice when the con-
sequences already occurred (swelling, pain, and instability). When it happens chances for successful treatment are lower. Treatment for pain can be success-
ful, but there is no treatment that can remove swelling totally. Instability can be fixed with surgical procedures.

Age groups have been processed in next way. From total number of patients we have created 3 age groups. First one was patients up to 18 years of life, sec-
ond one are the patients from 18 up to 45 years of life, and third group was pa-
tients over the 45. years of life. We get next results: in first group there is 21 patient or estimated in percents 42%, in other group there is 19 patients or in percents 38% and in third group we had 10 patients or in percents 20%.

This distribution gave us the expected results, because the sports activ-
ities are the most usual in the younger ages and we have take in consideration that the most active group is the one who is¨constantly moving¨.

We have been surprised with the overseen number of cases with the rupture of one or more ligaments on lateral part of ankle joint. This paper has shown that there is a high and significant number of patients like that who have suffer serious injuries of ligamen-
tous apparatus and as a consequence chronically instability occurs. From 100 examined patients 13 patients have been diagnosed with rupture of talofib-
ular ligament.

Considering that there are no simi-
lar data like this in BiH, we can say that this number is enormous high. Con-
sulting foreign literature and research paper that we got from medical journals, we noticed that developed countries had overcome this problem introducing strict protocols for doctors. This gave results in a low number of overseen injuries.

Number of days between the moment of injury and the doctor examination is very important for future treatment and the consequences that can occur at patients. Patients were distributed in three groups dependence on the days from injury. First group is consisted of patients who were looking for doctors help at the day of injury or next day. In this group we had 38 patients. In this group we classified 38 patients. Second group is consisting of 20 patients that have contacted physician in period from 2 to 7 days after the injury. In third group were four patients which contacted physician after more than seven day.

As a comment on this data we can say that the awareness of our patients about the seriousness of this injury is very high, in favor of this is a fact that the highest number of patients came to examination in a short period of time, got adequate treatment and had pass without recidivism and difficult consequences.

Number of patients that contacted physician later is for worrying and this improves inadequate and not treated on time, so the consequences for joint were unavoidable and lead to the chronic ankle joint instability.

Based on this data we can conclude that the large number of "sports injuries" is expected as the low number on injuries on work place. Patients from group "Free time" are the most pupils from elementary and high schools and their number of injuries is surprisingly high. "Other places" are represented as expected, considering high number of places with high risk for injury occurrence, we can say that this number is in the range of normal.

Early distortion is very important in distortion etiology. 38 (34%) of 50 patients processed in this study did not have earlier ankle joint distortion, 16 patients (32%) had one or more similar injuries before. We consider that the number of patients with earlier distortion is very high which is in favor that the number of overseen serious injuries is very high, and it is present in a significant number in population. We need to say that majority of these patients are in training process.

Distortion treatment is different it's usually individual and different between physician. This also depends on economical situation in country and the level of health care in country.

Yet all it comes down on same, and that is a joint inaction for one period then physical therapy. In our case we have used what we have available and that is gypsum, some immobilization boot – orthosis and etc.

13 patients with first level of ankle joint distortion have been treated with bandages or brace. Treatment has last for 2 weeks.

25 patients with a full treatment of four weeks (2 weeks splints and 2 weeks bandages) have been treated with splints and bandages.

12 patients with a full length of treatment from four to five weeks (2 weeks splints and last with full gypsum) have been treated with splints and full gypsum.

In just one case we needed to react with surgical treatment and it was on complicated luxation fracture of ankle joint with a rupture of most ligaments.

According to the conditions in which we have conducted our work, we achieved great results. Based on a feedback from our colleagues from Ward for Rehabilitation and Physical medicine treatment has been graded as a very successful. After removing immobilization, either we speak about bandages, splints of full circular gypsum, patients did not have any pain and could make all movements in almost full range without pain.

State of patients in dependence on the length of physical therapy and the number of patients who had any type of physical therapy after the distortion of ankle joint is:

43 (83%) of 50 patients in control group has done necessary part of physical exercise after injury recovery.

29 of that 43 patients has done physical exercise in duration from two up to four weeks what gives excellent results while 14 patients has done physical exercise longer than one month.

Physical rehabilitation is crucial part in treatment of these injuries. Treatment without physical rehabilitation is uncompleted and unfinished. Good cooperation with Ward for Physical medicine and rehabilitation should be emphasized but also all the patients should be commended because they took this treatment very seriously. However, there were also some of them who did not take this seriously and did not finish their therapy.

Consequences depending on the length of immobilization and the length of physical therapy showed very interesting results. Result that we got on a examination of pain, swelling and the ankle joint instability after the treatment was very surprised. Consequences of this type are very usual when we consult expert literature, but also we should consider that one number of patients, 15 of them, did not complied their therapeutic procedures to the end and this was one of the main reasons of these changes after the treatment. This 15 patients have been diagnosed with all these three symptoms after the treatment and conducted physical therapy.

In all three residual symptoms Hi – square test value is bigger than theoretical value so the zero hypothesis is rejected, it means there is dependence between the modality pain, swelling and joint instability according to the applied therapy.

13 patients have recidivism with same injury, ankle joint distortion and all of them where part of risk group – athletes who are more exposed to these injuries then the other persons. This number expected beside the consistent and serious therapeutically approach.

6. CONCLUSION

As a conclusion we should emphasized (author himself is a part of one group with a rupture of ATFL) that there is a high number of overseen serious injuries of ligamentous apparatus of lateral part of ankle joint. We think that this is one of main messages of this work.

We emphasized that this one of the first, maybe the first one in our region which deals with this apparently unimportant injury. We appeal to Our
colleagues to approach this injury seriously and pedantically in manner of examination and treatment because each oversight lead to the higher risk of injury recidivism, chronic instability on ankle joint, cartilage damage and speeding up arthritic changes in joint which have impact on patients quality life.

With good examination level of injury can be determined correctly and more precisely and based on that we can specify adequate therapy which should not leave any consequences on person and should provide him normal return to everyday activities. We emphasize this importance to the sport injuries, because the professional athletes are doing that for their life and their families.

High number of these injuries at kids in schools is saying that the additional education about the risk of these injuries is necessary for the kids and teachers.

It is important to say that in middle economical developed societies like ours, Varus stress X-rays are the best method for diagnostic rupture of lateral ligament in ankle joint. Although our Institution has ultrasound, CAT scanner and MRI, still X-ray imaging is more simple, cheaper and faster diagnostic method. Risk of X-ray imaging is taken to minimum with usage of X-ray apparatus of last generation and adequate patient protection. In every hospital protocol and standards for stress imaging should be implemented.

Number of consequences of this injury is very significant and worries. New method of treatment should be implemented as soon as possible in order to achieve better therapy and faster recovery without consequences.

As first, gypsum immobilization should be changed with orthopedics orthosis. If we consider this case, we should use walking boot which gives best commodity because patient can take it off and put it on by himself and the physical treatment can start immediately after what consequences and recidivism are significantly lower (American and British literature and journals are consulted).

Large number of recidivism in our work (totally 26) is saying that different therapeutic approach should be considered with this type of injuries.

Surgical reconstruction should be urgent in cases of totally ruptured ligament and that would give us lower number of recidivism as a result.

REFERENCES