

### MOŽNÁ PŘÍČINA „BOLESTIVÉHO SYNDROMU KLOUBŮ DOLNÍ KONČETINY“ – POPIS A KASUISTIKY

### A POSSIBLE CAUSE OF THE “PAIN SYNDROME OF LOWER EXTREMITY JOINTS” – DESCRIPTION AND CASE REPORTS

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#### ABSTRACT

The problem of lower extremities joints is mostly connected with arthrosis (osteoarthritis). For a few years we have been observing (T. Karski, J. Karski and J. Pyrc) a new problem of the foot – namely “the insufficiency and pain syndrome of ankle joint”. Another observation enabled us to see similar problem connected with the knee and in some older patients also with hips, where the first symptoms of arthrosis were in the hip joint and the movement was restricted, especially the internal and the external rotation. We found that this “pain syndrome of lower extremity joints” is connected with the way of getting out from the car. This pain syndrome – mostly ankle and foot – is more frequent among patients who use small cars everyday. If the driver or the passenger puts one leg on the ground during getting off the car, the rotation movement of the whole body appears, ankle joint and knee joint “sub-distortion” occurs, as well as at hip joints – if the rotation movement was initially limited because of arthrosis.

The authors introduce so far not depicted mechanism of chain formation of disorder underneath at lower extremity in 29 different cases. This mechanism is biomechanically meaningful for development or progression of so-called pre-osteoarthritis or osteoarthritis. The prophylactics recommendation and physiotherapy gave the very good results in all followed patients suffering from recently described “pain syndrome of lower extremity joints”.

**Keywords:** Chronic distortion – ankle, knee and hip joints – pain syndrome – lower extremity joints

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## INTRODUCTION

According to the observation of all our cases in Out-Patients Clinics and in our Orthopedics Departments, the main reason for musculoskeletal disorders, deformations and pains originates in the shortenings or even contractures of ligaments, tendons, muscles, capsules but not in weak muscles.

The first article about “the shortenings of soft tissues” was presented by Professor Hans Mau in many articles (in German – “Siebenersyndrom” (13, 14) and also in authors articles printed mostly in USA and in Czech Republic.

In the presented article the authors inform about the “syndromes of pain in ankle joints, knees and hips”. The pathology is connected with rotation distortions movement of the body during getting out of small cars, repeated frequently every day, for many months or years.

## MATERIAL

During the period of 5 years we have treated 29 patients (n=29) with chronic insufficiency caused by the repeated distortion of the ankle joint leading to limitation of dorsal flexion of the foot and pain syndrome. We have also treated many patients (circa 50) suffering from knee and hip pain because of rotation distortion in every day activity or because of getting out of the car (Fig. 1a, 1b, 2a, 2b, 3, 4).



**Fig. 1 a, b:** Case 1. A patient, 37 years. Examined in Sarbinowo in July 2017. Clinically: full instability of the left ankle joint, swelling and hypertrophy in sinus tarsi and in Achilles region, pain by walking. Diagnosis: chronic distortion of ankle joint during getting out from the car Toyota Corolla. We recommended him to go out from the car on both legs and to make dorsal and plantar flexion exercises of the foot.



**Fig. 2a, b:** Case 2. A patient from Prague, Czech Republic. 1<sup>st</sup> examination in Santiago de Compostela, Spain in June 2017. Left foot was swollen, painful, he was unable of normal walk, he had to walk on tip of left foot with help of a stick. He is a driver of car Skoda. I recommended him to go out from the car on both feet, make exercises of the foot. He informed me through e-mail in August 2017: my left foot is not swollen, no pain, gait is normal.

The cause of the distortion of the ankle joint and knee joint as well in “primary arthrotic hip joint” is the moment of getting out of the car. This pathology is seen in the left knee joint, left ankle joint of car drivers or in the right knee and ankle joints of passengers in countries with “the right traffic rules”. Patients before coming to us lacked proper diagnosis and the effective therapy. Doctors interpreted walking difficulty, knee and ankle pain as well as swelling of the soft tissues around the back part of foot mostly as a peripheral vascular disease.

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## The common foot problems [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12] and ankle joint pathology connected with the getting off the car [15, 16, 17, 18]

There are three main conditions of the pathology as a result of the ankle joint distortion:

1. the process of distortion lasted many months or even years,
2. this has to do with the size of the car – this happened mostly to patients driving small cars,
3. the driver or passenger gets out of the car placing one leg on the ground and making the rotation movement of the whole body on this one leg.

By such getting off the car, the load is placed on the foot on the ground and the extensive rotation movement of the body takes place. This causes the distortion movement. Such movement appears when the range of movement is bigger than the one naturally enabled by the joint. This pathol-



**Fig. 3:** Case 3. A man, 65 years. Five years problems of left ankle joint, chronic pain of left knee and of the left hip. Clinical examination: left foot and shank swollen, limited dorsal flexion. Diagnosis: chronic distortion of left ankle joint during getting off the car. X-ray anterior-posterior view. Arrows show the place of distortion.



**Fig. 4:** Case 4. A man, 25 years. Pain of the left foot and swelling 3 years. Many consultations but no proper diagnosis and no proper therapy. Clinically was found (2012) the instability of the left ankle joint. Arrows show the place of distortion. Diagnosis: permanent rotation "sub-distortion" by getting off the car. We advise the prophylactics management and proper physiotherapy.

ogy occurs in the ankle joint and in the knee, because both these joints, physiologically, have only flexion and extension movement – no rotation movement. In the moment of distortion, the ankle joint is in dorsal flexion of  $0^{\circ}$  to  $5^{\circ}$  and fully stabilized between both malleoli. In this position, when talus between both malleoli is situated firmly the rotation movement of the ankle joint and of the knee occurs. The synostosis tibio-fibulare is extended extremely, similarly, ligamentum collaterale and cruciatum of the knee are extended.

Such repeated – over weeks, months and even years – distortion of the ankle joint and the knee, causes loosening and consequently instability of these joints. The diminished stability of the ankle joint, and for some patients in the knee joint, is the cause of permanent annoying pain. In examination of the stability of the left ankle joint – of the drivers, or right ankle joint – of the passengers, the authors have observed the loosening even among people with temporarily healthy function of the foot. The same symptoms – loosening of the joint – were found, even in people without knee pain.

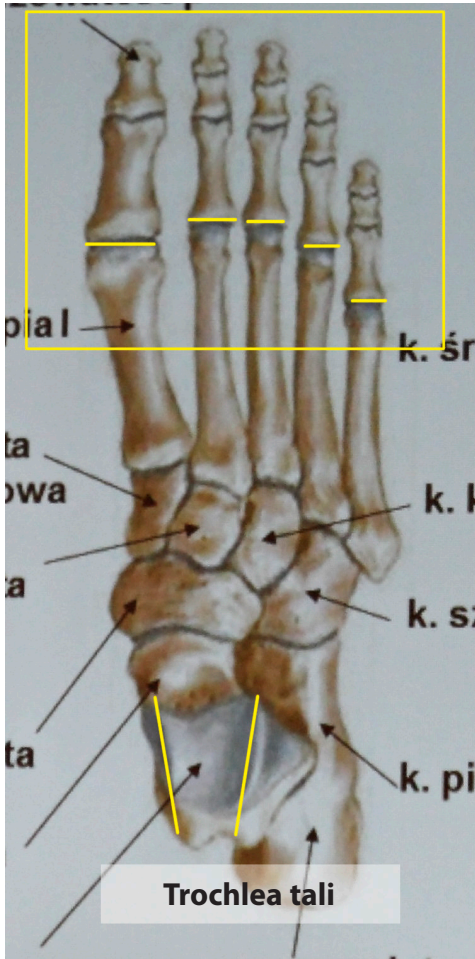
Clinically, we have noticed a swelling of the ankle joint region, of the knee, in region of the sinus tarsi and in Achilles tendon region. Patients trying to avoid the pain start to walk on tip toes (in pes equinus position). Consequently, the overstress in the triceps surae and in Achilles tendon appears as well as pain in m. triceps surae and Achilles region after walking in such a manner for a long time. Before being examined by the authors, all patients had been treated for vascular disease. Anticoagulant medication, which gave no any positive effects, was prescribed.



**Fig. 5:** Getting out of the car on one leg/foot is not proper. It can cause “sub-distortion” of the left ankle and left knee joints, swelling, limitation of movement, disturbance of gait.



**Fig. 6:** The getting out of the car on both legs/ feet is proper. It is a prophylaxis against possible “sub-distortion” of the left ankle and left knee joints. This is an important message for the drivers and passengers who can overload the right leg.



**Fig. 7:** The skeleton of the foot (the picture taken from an anatomy book – Website). Frontal part is loaded especially in region of metatarsal – phalangeal joints. Movement in these joints is very important for propulsion, loading by every step during walking. Back part of foot is stable. In ankle joint are only two motions – dorsal and plantar flexion. Thanks to the wider frontal part of trochlea tali it is possible to walk upstairs and up mountains.

## Knee

A healthy knee joint has two-directional movement: extension and flexion. The problem appears while getting out of the car onto one leg – the left in the case of the driver and the right in the case of the passenger. While performing this movement the knee rotation causes some “sub-distortion”. During examination, such knee shows signs of instability caused by loosening of lateral and medial ligaments and/or the cruciate ligament of the affected joint. The problems of the knee are especially serious when varus or valgus deformity as the additional pathological changes of the axis of knee appears. This deformation of the axis of leg, often present since childhood, is the cause of the loos-

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ening of the lateral and medial ligament and at adulthood frequently causes pain symptoms. The problem with the left knee can be observed among drivers and with the right knee in passengers from the countries where the traffic rules are on the right. These pathological symptoms are particularly common among patients who have often been driving in short distances and very frequently getting out of their cars on daily basis over many months or years. Such causes of the knee insufficiency should be identified among all patients coming to us.

## Hip

While we get out of or into the car we need to make a rotation movement of the body. When the hip joint does not present any pathologies we have full movement – such maneuver is easy and causes no pain. When arthrosis of the hip joint begins – and the movements become to be limited, mostly internal rotation and abduction, the patient feels pain and getting out and into the car becomes difficult. Consequently, the occurrence of the pain while performing these movements indicates the beginning of the arthrosis of the hip. In clinical examination, we can notice the limitation of abduction, extension and what is the most important – the restriction of internal rotation. This movement is necessary for our walking. In gait we need not only flexion and extension but also rotation movement of the hips in every step. By “a rushed, quick walk” the patients feel pain. The first line therapy should be focused on the restoration of the hips movements. The problem is further discussed in the following chapter.

## PROPHYLAXIS AND TREATMENT

In all the cases of the patients, coming with the problem of the hip joints, knees and ankle joints we examine precisely stability of the joints and we thoroughly discuss the possible causes. We have paid particular attention to the possible existence of coxarthrosis. We inform the patients about the need to avoid the rotation movement while getting into and out of the car and while performing other daily activities involving similar rotation movement of the body. For therapy we recommend getting out of the car onto both legs and both feet (**Fig. 1a 1b**) and never on one foot. We also stress the importance of exercises such as extension, isometric exercises for knee as well dorsal and plantar flexion of the foot. Additionally, we suggest the highly beneficial role of laser, diadynamic, iontophoresis, and local cryotherapy. The significance of prophylactics among all drivers all around the world should be highlighted.

## DISCUSSION

The complaints concerning pain in one knee and in one foot should be analyzed also in the context of driving small cars and the manner of getting into and out of the cars (**Fig. 5, 6**). The authors described a group of patients with chronic pain caused by permanent distortion of knee or ankle joint. The problem appeared less frequently in the hip – only in those patients who had suffered from a limited rotation movement caused by coxarthrosis. In all examined cases, we observed knee instability caused



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by the loosening of lateral, medial or cruciatum ligaments, and instability in ankle joint. The anatomy and structure of ankle joint is very characteristic, that is the trochlea tali which has a bigger diameter in the front part than in back part. Such anatomy enables blockage of dorsal flexion of the foot which provides stabilization of the ankle joint while every step, for example while walking upstairs or up mountains (**Fig. 7**). Interestingly, in dorsal flexion, this joint is very sensible for distortion.

## CONCLUSION

The authors introduce so far not depicted mechanism of chain formation of disorder underneath on lower extremity in 29 different cases. This mechanism is biomechanically meaningful for development or progress of so-called pre-osteoarthritis or osteoarthritis.

They found that above described "chronic pain syndrome of joints of lower extremity" is caused by rotation mechanism. It is connected with the way of getting out the car with consequence of the chronic "sub-distortion" of the ankle, knee and hip joints or getting into the car when particularly the hip joint is overloaded.

The problem affects the left foot and left knee of drivers and the right foot and the right knee of passengers in countries where the right traffic rules are obligate.

For therapy, we recommend change the manner of getting into and out the car (more important) that means on both legs and both feet without any rotation movement of the trunk. Additionally, we advice kinesiotherapy, hydromassage, laser, diadynamic therapy, etc.

All orthopedic surgeons, rehabilitation doctors and physiotherapists should be familiar to the problem of chronic "sub-distortion" and they should further inform about necessity of prophylactics all patients in all countries.

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