

CHARACTERISTICS OF THE TALOCRURAL (ANKLE) JOINT INJURIES AND THEIR TREATMENT

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Summary. The ankle joint is one of the most complicated anatomic – functional structures of the locomotor system. The upper ankle joint (art. Talocruralis) matches the lower ends of shin – bone (tibia) and calf – bone (talus), so it shows a connection between the bones of a lower leg and foot. The upper ankle joint, together with the lower one, behaves as a functional, anatomic and clinic whole, not only in physiological conditions but also at most injuries. The most frequent injuries that sportsmen have are the injuries of ankle joint, knee, and lower leg. Sprain, pulling and contusion are the most represented types of ankle joint injury. The sprain or distortion (lat.distorsio) represents a set of injuries of ligaments, joint capsules as well as of the linking of tendons and muscles in the joint area, and it is caused by action of rough motor power. Distortion is noticeable when the movement amplitude goes over the physiological limit. As the most common mechanism of ankle joint injury there is a foot inversion which is in supination and adduction. There has been noticed greater incidence of this injury at the sportsmen who make frequent jumps (football players, athletes). Our study has included 102 patients with ankle joint injuries, at the age from 18 to 35. Those with clinical and radiographic diagnosis of sprained ankle have been observed in the outpatient clinic of the department for orthopaedics and traumatology in Clinical center of Montenegro in Podgorica. The examinees have been of both sex, divided into two groups, professional (65) and amateur sportsmen (37). Examination has been done in the period January – November 2006. The results of our study show that the most frequent injuries at the distortion of ankle joint are the injuries of lateral ligament mechanism as well as the sprain of medium level. These injuries are more often at professional sportsmen.

Key words: Sprain, ankle joint

Introduction

The injuries of talocrural (ankle) joint are often and include a great part of lower limbs trauma, and that is why they draw attention from the both practical and theoretical view.

Because of great frequency and the variety of clinical and radiographic picture the ankle joint sprains at sportsmen are of high importance. Of there is no timely diagnosis or the treatment is inadequate there may come to chronic joint instability, pains while making some efforts or even the swelling which may considerably limit the activities of sportsmen (1).

Still Hipocrat (460-370 BC) mentioned ankle joint sprain. He stated that the dislocation of foot in upper ankle joint is connected with pulling of joint bodies parts, and it represents a thesis – once sprain, sprain forever (1,2).

Father of French surgery, Ambroas Pare (1510-1590), also visuals and Heisler from England, first described a mechanism of ankle joint injury occurrence (2).

Cooper (1823-1841) describes the upper ankle joint injuries including the dislocation of tibia parts. Chaput mentioned in 1899 that the injuries of collateral ankle joint ligaments occur in 1:10.000 persons every day (3).

There are more tenths of thousand people in the USA getting ankle joint injury every day, so doctors report about 27.000 ankle joint sprains every day. In Great Britain there are over 5.000 persons per day getting an ankle joint sprain (4,5).

The ankle joint injuries of soft tissues make 12% of all the injuries of locomotor system which are treated in the outpatient clinic for urgent cases.

Sportsmen, whose profession needs more movement, standing, lifting and carrying weight, tend to get such injuries which may cause serious and long – lasting incapacibilities (6).

As the most common mechanism of ankle joint injury it is stated the inversion of foot which is in supination and adduction. Greater incidence of this injury is noticed at sportsmen with more often jumps (football players, athletes) (7,8).

The injuries of ligament system of ankle joint make 85% of all sprains which are furthermore the most frequent. Emphasized plantar flexion and inversion of foot make the main mechanism of this ligament complex injury occurrence (8).

The injuries of medial part of ankle joint make just 5% of soft tissues injuries of ankle joint they occur mostly due to big foot eversion (9).

In relation to a mechanism of occurrence, trauma intensity and pathoanatomic result, there are differentiated four levels of ankle joint sprain in clinical picture:

1. level one – elongated sprains
2. level two – lacerated sprains
3. level three – ruptured sprains
4. level four – avulsion fracture

While making a diagnosis of any ankle joint injury it is very important to pay attention to disease history especially to the mechanism of injury occurrence (position in which the foot was, possibility of leaning, time of hematoma occurrence) together with clinical examination (swelling, palpation sensitivity of the characteristic points), and RTG diagnostics too (10).

Treatment of the patients with ankle joint injury may be operative and non operative. The second one supposes setting the immobilization, but the operative treatment meant the suturation of ruptured ligaments and capsule using plaster or other immobilization lasting 3 – 6 weeks (10).

After ankle joint injury a return to sport activity is possible but only when a whole volume of movement is done without pain and when the proprioception and strength are gained again (9,10).

If the proprioception is weakened (harmed persons), pain is still present, volume of movement limited, the physiotherapy should be prolonged then (8, 9, 10).

Chronic instability of ankle joint is treated with prolonged rehabilitation, protective bandage of ankle joint degenerative artrotic changes at the ankle are followed by long lasting chronic disorders (10).

When the treatment is finished, the sprains generally don't make any obstacle for further sport activities. Remained ligament unsteadiness or chronic edema in some cases may make difficulties while standing or walking, so very rarely the interruption of sport career is recommended.

Aim of the Study

- to determine the characteristic of ankle joint injuries at professional sportsmen in comparison to amateur ones
- to determine the characteristic of ankle joint injuries treatments at professional sportsmen in comparison to amateur ones.

Methodology

This study has included 102 patients at the age of 18 to 35. All of them asked for medical help in the outpa-

tient clinic of the department for orthopaedics and traumatology Clinical Center of Montenegro, because of ankle joint injury.

Examined patients are males and females divided into a group of professional sportsmen and a group of amateur sportsmen.

Examination was held during a period of one year, from November 2005 to November 2006.

After the RTG confirmation of a diagnosis the examined patients have received planned treatment.

Results

The group of professional sportsmen consisted of 65 members, while the group of amateur sportsmen consisted of 37 members. Among the professionals there were more males 54, unlike the amateurs 25 (Table 1).

Table 1. Distribution in examined groups according to the sex

Type of sport	Sex				Whole	
	Male		Female		N	%
	N	%	N	%		
Professional	54	83.10	11	16.90	65	100
Amateurs	25	67.57	12	32.43	37	100
Whole	79	77.45	23	22.55	102	100

$$\chi^2 = 3.25; \text{ n.s.}$$

The sprains of lateral ankle joint ligaments were the most common in both, groups of professional sportsmen (90.77%) and amateurs (78.38%), while the medial ligaments were significantly more seldom injured at professionals (3.08%) and amateurs (8.11%).

Combined injury of lateral and medial ligaments was more often got by amateurs (13.15%), while the professionals got the injury of ligament system (6.15%). This difference was not statistically important.

Table 2. Frequency of sprain of some ankle joint parts in both groups

Group	Injured ligaments						Whole	
	Lateral		Medial		Lat + med		N	%
	N	%	N	%	N	%		
Professionals	59	90.77	2	3.08	4	6.15	65	100
Amateurs	29	78.38	3	8.11	5	13.15	37	100
Whole	88	86.28	5	4.90	9	8.82	102	100

$$\chi^2 = 3.08; \text{ n.s.}$$

Table 3. Frequency of each sprain level

Type of sport	Sprain level								Whole	
	Easy		Medium		Difficult		Avulsion		N	%
	N	%	N	%	N	%	N	%		
Professional	16	24.62	27	41.54	19	29.23	3	4.61	65	100
Amateur	12	32.43	18	48.65	5	13.51	2	5.41	37	100
Whole	28	27.45	45	44.12	24	23.53	5	4.90	102	100

$$\rho = 0.312; \text{ p} < 0.01$$

As for the frequency of sprain level, there were the most sprains of medium level at amateur sportsmen (48.65%), then easy one (32.43%), difficult level (13.51%) while there were least avulsion fractures (5.41%). Professional sportsmen had medium difficult sprains (41.54%), then easy ones (24.62%), difficult (29.23%) and avulsions (4.61%). Very significant statistical connection was found here ($p < 0.01$).

The highest number of injured patients were treated in outpatient clinic, 63 professionals (96.92%) and 34 amateurs (91.89%), while only a few were treated in hospital, (3.08%) professionals and (8.11%) amateurs. Hospital treatment was undergone mainly because of planned operative treatment.

The number of hospital treated patients insignificantly goes in favour of amateur sportsmen. This difference was not statistically important.

Table 4. Hospital treated patients after the injury

Group	Hospital treatment				Whole	
	Yes		No		N	%
	N	%	N	%		
Professionals	2	3.08	63	96.92	65	100
Amateurs	3	8.11	34	91.89	37	100
Whole	5	4.90	97	95.10	102	100

$$\chi^2 = 0.43; \text{ n.s.}$$

This doesn't mean that all the injured patients who were hospitalized were also treated in operative way. All hospitalized amateur sportsmen were treated operatively (8.11%), but that was the situation with professional sportsmen (1.54%). That is why this difference was statistically important ($p < 0.05$).

Table 5. Operatively treated patients after ankle joint sprain

Group	Operated				Whole	
	Yes		No		N	%
	N	%	N	%		
Professionals	1	1.54	64	98.46	65	100
Amateurs	3	8.11	34	91.89	37	100
Whole	4	3.92	98	96.08	102	100

$$p = 0.567; p < 0.05$$

Discussion

In the last few years the number of ankle joint injuries has been increasing. In addition to this statement there are many data. Clanton says in his that recreationists are mostly injured, and 3% of injuries are those of foot injuries (5). Foot is very adjustable, but the vertical pressure of 0.6 times of body weight while walking is even 7.9 times while running or jumping, and that may cause acute injury. Besides, the fact is that the tissues lose flexibility while becoming older, and if there is no preparation they lose strength and elasticity, and tend to be harmed.

According to Hockenbury the frequency of sprains depends and injury mechanism as well as strength of ligament which protects the joint (7).

Studies of Garrick and co, Jackson, Zöch, mostly state the injuries of lateral ligament system (85–90% cases), isolated injuries of medial ligaments (3–5% cases), and the rest were combined injuries (6, 11).

Yeung and Chan say that the most frequent disorders are those of lateral ligament complex, while the others are much less presented (12).

When the question is about disorder of some ligaments it is noticed in this study that the most injured in both groups of examined patients is lateral ligament particularly at professional sportsmen (90.77%), and amateurs (78.38%). Injuries of medial ligament were the rarest, at professionals (3.08%) and amateurs (8.11%).

Beynonn and co. in the study undergone among 118 sportsmen (football players, hockey players) state that the most common level of sprain was medium one, it means lacerated sprains (2).

In this study the most presented was the sprain of medium level, at the professional sportsmen (41.54%) and at amateurs (48.65%). The rarest were the sprains of fourth level or avulsion fractures, at professional sportsmen (4.61%), and amateurs (5.41%).

There are many contradictory opinions about treatment of ankle joint injury.

According the opinion of Linde and co. it is often made a mistake with the initial care of these injuries. Mostly, the injured place is infiltrated with local anaesthetic and the sportsmen are allowed to continue the activity. Such a patient is released of pain, but this way enables the rupture of ligament capsule structures. Because of this such patients undergo the process of immobilization, in position when the ligaments are unsteady (position of the least joint capacity), at least for three weeks. In order to achieve functional stability of the joint the long lasting physiotherapeutic procedures are necessary. Sometimes, the surgical treatment and the capsule and ligament are taken place (9).

In researches made by Van Dijk, the analyses have shown that the functional status of surgically and non-surgically treated sportsmen was the same at the sprains of the third level after completed treatment. The remark is that there were fewer complications at the non – surgically treated patients. Nowadays it prevails the attitude the conservative treatment is a method of choice at the sportsmen with sprains of third level (13).

Cooper and co. claim that inf non – surgical treatment doesn't succeed a subsequently done surgical reconstruction may give equally good results, even if it is done a year after the injury (3).

In our study (3.08%) professional sportsmen and (8.11%) amateurs were hospitalized, while the greatest number of professionals (96.92%) and amateurs (91.89%) were treated in an inpatient clinic. Professional sportsmen (1.54%) and amateurs (8.11%) altogether were undergone to surgical way of treatment, while (98.46%) professionals and (91.89%) amateurs were treated with non – surgical methods.

Conclusion

– In both groups of examined patients the most common sprain was the one of medium level, and mainly injured was lateral ligament system.

– The most common treatment in both groups was non – surgical, while the small percentage of ankle joint injuries in both groups was treated surgically.

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KARAKTERISTIKE POVREDA SKOČNOG ZGLOBA I NJIHOVO LIJEČENJE

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Kratak sadržaj: Skočni zglob predstavlja jednu od najkomplikovanijih anatomsko-funkcionalnih struktura lokomotornog sistema. Gornji skočni zglob (art. talocruralis) povezuje donje okrajke goljenjače (tibia) i lišnjače (fibula) sa skočnom kosti (talus) tako da predstavlja spoj između kostiju potkoljenice i kostiju stopala. Gornji skočni zglob, zajedno sa donjim ponaša se kao funkcionalna, anatomska i klinička cjelina ne samo u fiziološkim uslovima nego i kod većine povreda. Kod sportista, najčešće su povrede skočnog zgloba, zatim koljena i potkoljenice, a najviše zastupljeni tip povrede skočnog zgloba je uganuće, zatim istegnuće i nagnječenje. Uganuće ili distorzija (lat. distorsio) predstavlja skup povreda ligamenata, zglobne kapsule i pripoja tetiva mišića u predjelu zgloba koja nastaje dejstvom grube motorne sile. Distorzija se ispoljava kada amplituda pokreta premaši fiziološke granice. Kao najčešći mehanizam povrijeđivanja skočnog zgloba navodi se inverzija stopala, koje je u supinaciji i addukciji. Kod sportista koji imaju česte skokove (fudbaleri, atletičari) opažena je povećana incidenca ove povrede. Analizom su obuhvaćena 102 bolesnika sa povredom skočnog zgloba, starosne dobi od 18 do 35 godina. Ispitanici kod kojih je klinički i radiografski postavljena dijagnoza uganuća skočnog zgloba, opservirani su u ortopedsko-traumatološkoj ambulanti KCCG u Podgorici. Ispitanici su bili oba pola, podijeljeni na profesionalne sportiste (65) i sportiste amatere (37), a ispitivanjem je obuhvaćen period od januara do novembra 2006. godine. Rezultati našeg istraživanja ukazuju da su najčešće povrede pri distorziji skočnog zgloba povrede lateralnog ligamentarnog aparata kao i uganuća srednjeg stepena. Ove povrede su češće kod profesionalnih sportista u odnosu na sportiste amatere.

Ključne reči: uganuće, skočni zglob