Osteochondral Fractures of the femoral Condyles in Athletes

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SUMMARY

It was usually the result of an isolated injury. The early diagnosis was made by different X - rays views anteroposterior, lateral, oblique and tunnel views.

In some cases replacement of the osteochondral fractures and fixation had been carried out and in other cases either the fragments had been removed or the knee was left undisturbed.

The procedure and the results are analysed.

Osteochondral fractures although may be found in many joints, are most common in the knee following injury to the articular surface of the femur. All of our patients were either injured through a direct blow to their knee or were injured when they were taking part in sports, e.g. jumping, footbool, basketball, skiing etc.

Twelwe patients consisting of ten males and two females were examined. In all the patients the lesion was unilateral. The average age was twenty years but a wide range from 17-24 years was seen. The average follow up was five years.

TABLE I. Classication according to the age and sex of the patients

Number of patients	Age	Sex
10	18-24 years	Males
2	17-23 »	Females

Mechanism of their injury

Four of our patients sustained the injury after a violent twist to their knee during football game and jumping; they developed the so-called «endogenous of the medial condyle».

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Three others sustained a direct blow to their knee during a heavy fall. They developed the so-called «exogenous fractures» of the medial condyle.

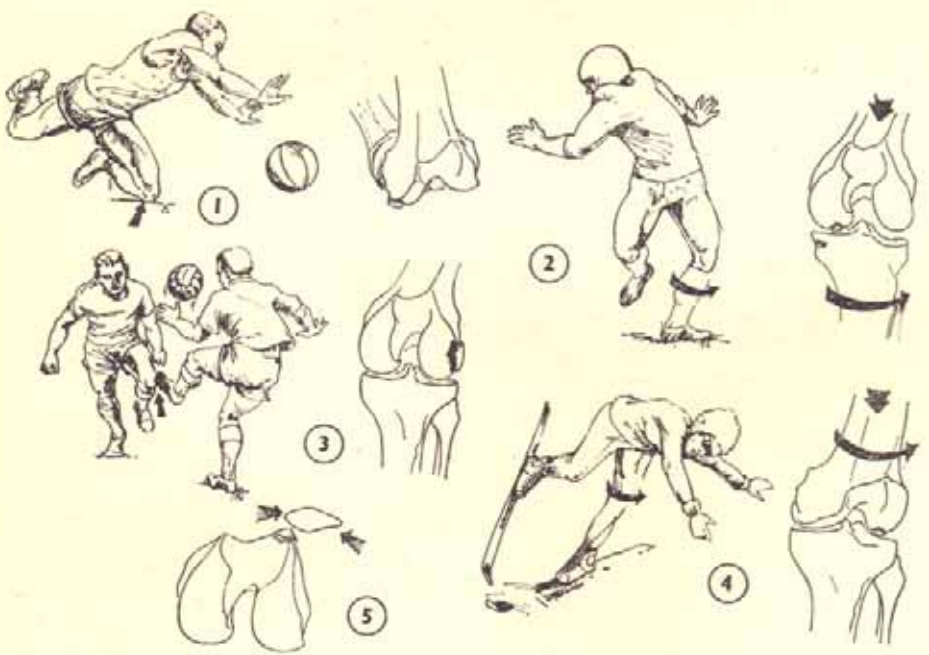
Two had a history of dislocation of the patella which was reduced by themselves (endogenous fractures of the lateral condyle).

Three remaining patients had injuries resulting from direct blow to the knee and developed exogenous fractures of the lateral condyle.

Regarding the site of the injury five cases had loose osteochondral fractures of the lateral femoral condyle and seven had free fragment coming from the medial femoral condyle. The diagnosis was based on the history, the clinical findings and several x-rays views anteroposterior lateral oblique and tunnel views.

Operations were performed on all the patients. Three were operated on within three days from their injury, five within ten days.

As Landlles has showed the articular surface does not have a«tide mark» (i.e. the junction between calcified and uncalcified cartilage) in adolescents as they have very little calcified cartilage the shearing forces are transmitted deep to the ospeochondral function producing the osteochondral fractures.



Resim : 1. The various ways in which the fractures occur

TABLE II. Classification of osteochondral fractures of the femoral condyles

Number of patients	site	Type	mechanism
three	medial condyle	exogenous	Direct blow
four	medial condyle	endogenous	Rotation and compression forces
three	lateral condyle	exogenous	Direct blow
two	lateral condyle	endogenuus	patellar dislocation

Resim : 2. Fracture in the lateral femoral condyle.

Long follow up and results

All our patients have been examined and followed up from 1-7 years. The patient with the application of the screw was the only one who did not do well as he developed effusion and stiffness of the knee and he had to be operated on for removal of the screw after two months time. Eventually, he regained a good range of movements and good muscular strength. All the others did very well and the results were very good. None of them had any pains, swelling or limitation of knee movements. The muscles around the knee joint were with normal strength.

The time of recovery was between three and six months.

In two cases the fragment was repositioned and fixed with screw and pins.

They were operated on within three days from the time of the injury.

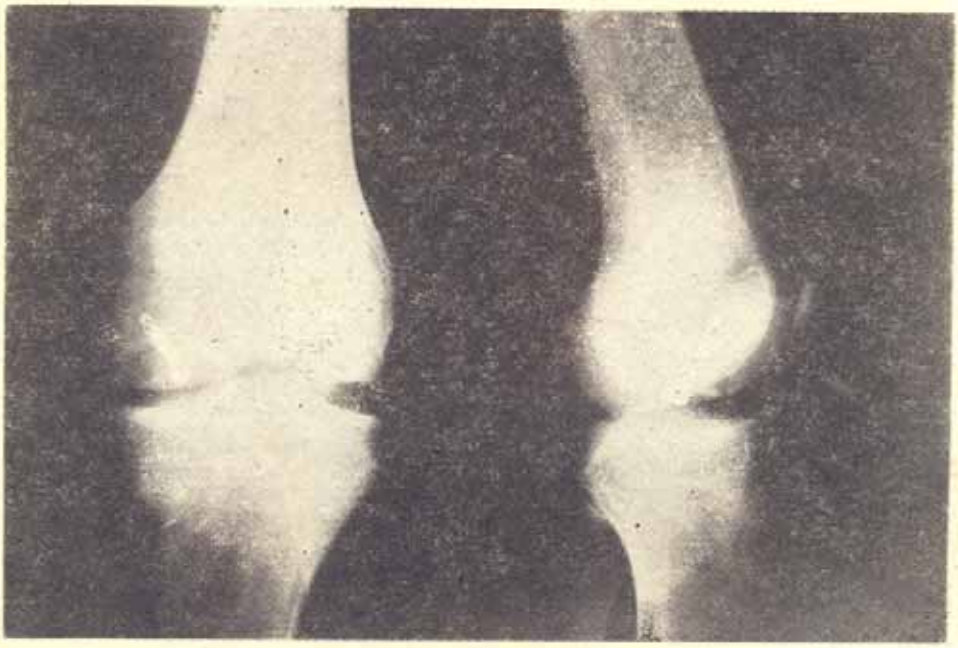
In both these cases the fragment came from the weightbearing surface in the medial condyle and the size of the fragment was one to two centimeters.

In four cases the fragment was excised as it came from the non weight bearing surface and practically was not possible to achieve precise fit to the host. In five cases where the fracture was in the lateral condyle it was again removed.

We want to emphasize that when the fragments is free, repositioning of it should not be attempted if the time of the injury is more than two weeks.

Long follow-up

All our patients have been examined and followed up from 1-7 years.



Resim : 3. Fracture in the medial femoral condyle which has been fixed with a screw.

TABLE III. Mechanism of injury and late results

Age	Sex	Mechanism of injury	Operative findings	Operation removal	Follow-up	Results
18	Male	Twisted the knee in football	Fragment from medial condyle	Removal	3 years	good
24	"	Fall on the knee	" "	Fixation with screw	8 "	very good
21	"	Twisted the knee in skiing	" "	Removal	5½ "	" "
22	"	Twisted the knee in basketball	" "	Removal	6 "	" "
18	"	Twisted the knee in skiing	" "	Removal	5½ "	" "
22	"	Fall on the knee	" "	Fixation with two pins	7½ "	" "
22	"	Fall on the knee	" "	Removal	6 "	" "
19	Female	" " " "	Fragment from lateral condyle	Removal	4½ "	" "
23	"	" " " "	" "	Removal	5 "	" "

TABLE III (Contd.)

Age	Sex	Mechanism of injury	Operative findings	Operation removal	Follow-up	Results
21	Female	Slipped on the floor, dislocating Patella	Loose fragment of the lateral condyle	removal	7½	very good
20	"	Jumping and falling dislocating Patella	"	"	6	very good
17	"	Fall on the knee	"	"	4	very good

SUMMARY

1. Osteochondral fractures of the femoral condyle are rather common in the adolescent knee.

2. Osteochondral fractures of the femoral condyle could happen after dislocation of the patella, but may occur without dislocation.

3. Surgical intervention is recommended and should always be undertaken.

4. Removal or repositioning of the fragmentdepends on the size of the fragment, the time elapsed and the part of the articular surface where the fragment came from.

5. Osteochondral fractures ununited or misdiagnosed after a period of time would be impossible to distinguish from osteochondritis dissecants.

6. Special x-ray of the knee are of great importance in the diagnosis.

7. The osteochondral fractures are isolated injuries of the knee.

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Characteristics Of Sports Injuries In Football Players

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SUMMARY

The medical observations included 549 cases of injuries of second and third degree of gravity, happened to football players in the course of one year. 499 of the injuries were observed in competitors of club teams and 50 - in competitors of national level under dispensary treatment. The injuries were classified and the number of the different kind of injuries, inclusively microinjuries due to systematic overstrain, is presented. It is concluded that football players are most often exposed to distortions, contusions, lesions of the meniscus and muscle ruptures. Microinjuries lead usually to degenerative changes of tendons and joints. The gravity of injuries is studied in relation to the number of training days lost. The localization of the observed injuries is discribed, as well as the major reasons for their occuring.

549 sport injuries developed by the football players in the course of one year are analysed. Cases in which less then 5 training days had been missed were not included in the the sample.

79% of the injuries (Fig. 1) are macrotraumas and 21% microtraumas. In the last cases the pathological changes and the respective complains of the patients appear gradually in the course of periods of intensive physical exercises and are therefore considered as results of systematic physical overloading.

With a highest percentage in the structure of the sport traumatism are the sprains - 27.7%. To this percentage should be added 14.8% diagnostically identified meniscus lesions, developed with the sprain of the knee joint. Thus the total percentage of sprains increases to 42.5 %, followed by contusions (17.3%), ruptures of muscles (10.4%), insertionoses (9.1 %), factures (4.6%), arthroses (4.2%), chondroses (2.9%), tendinoses (2.7%) etc.

Among the microtraumas prevail injuries of tendon (insertionoses and tendinoses - 11.8%), which involve 56.5 % of this group. The evidently higher predisposition towards injuries of the attachment places of the tendons to the bones reveals the insertion as the most instable component of the tehdon towards physical overloading. An interesting fact is that arthroses make a relatively high percentage (4.2%), having in view that the average age of the football players investigated was 23.8 years. This injuries refer to the secondary arthroses. A joint injury prior to the arthrosis was found in 45 % of the cases. Nevertheless in the rest 55% such one was not identified. That may be considered as a reason for accepting that arthrosis has developed just as a result of systematic overloading of the joint. It involves the most loaded joints of the lower extremities as ancle joint, the joints of the big toe and the knee joint. Chondroses, which are affecting exclusively the intraarticular cartilages, make 2.9% of the total number of the injuries and 13.9% of the microtraumas. They may be considered as a pre-stage of the arthroses.

Some differances were established (Fig. 2) in the structure of the traumatism in national team's comperatitors as compared with club team's competitors. A higher percentage of microinjuries was obtained for national competitors (36%) then for others (19.4%).

The freguency of the injuries was established about 45 national competitors only, who were under continual observation for the one - year - period investigated They had been inflicted 50 injuries. So, the number of the injuries is higher than the number of competitors in one year period of time.

The injuies are located mainly on the lower extremities (Fig. 3). Only 38 of them (6.9%) pertain to the upper extremities, 34 (6.2%) to the trunk and 4 to the head. The higher is the number of the knee injuries (244 cases - 44%-, followed by thigh injuries (99 - 18%), calf injuries (60 - 10.9%) and ancle joint (51 - 9.3%).

51.7% of the injuries (Fig. 4) are developed during trainings and 43.3% - on competitions.

With a view to the adequate orientation about the prevention of sport injuries in football players we performed an ethiological analysis, too (Fig. 5). The

main causes of the injuries investigated appeared tobe to be some deficiensies in the methods of preparation of the competitors (284 injuries - 51.7%) and infringements of the rules of the football game (235 - 42.8%).

As far as the method of preparation is concerned (Fig. 6) the nonobservance of such basic principles as graduality, caused 16.6 % from the injuries, and individualization (2.7%) should be mentioned. The correct method of training is a gradual rationing of the load. Our investigations showes that this fact is often overlooked by the coaches. Forced training in cramped period is wrong. It does not give the motor system a chance of catching up with the increasingly higher requirement imposed upon the organism. This results usualy in microinjuries.

Bad arrangement of the exercises of daily workout (often underrating the warming up part or prolongation the basic part and omitting the closing relaxing part/is methodologically wrong and leads to 17.3 of all the injuries.

Significant number of injuries was proved to be result of new loadings upon the cells and tissues before their comp lete recovery after prior loading. Little by little such a practice develop pathological changes into the cells. In order to avoid this events recreation procedures to be applied following every competition, so as every high loading training, too. This is also very often overlooked in the football practice.

The injuries inflicted by infringement of the game rules represent a considerable number (235-42.8%). Only infringements sanctioning by the referee on competitions and the trainings games are included. The high percentage of causes for the injuries in this group suggests the necessity of a better education work with the competitors for correctness and sportmenship.

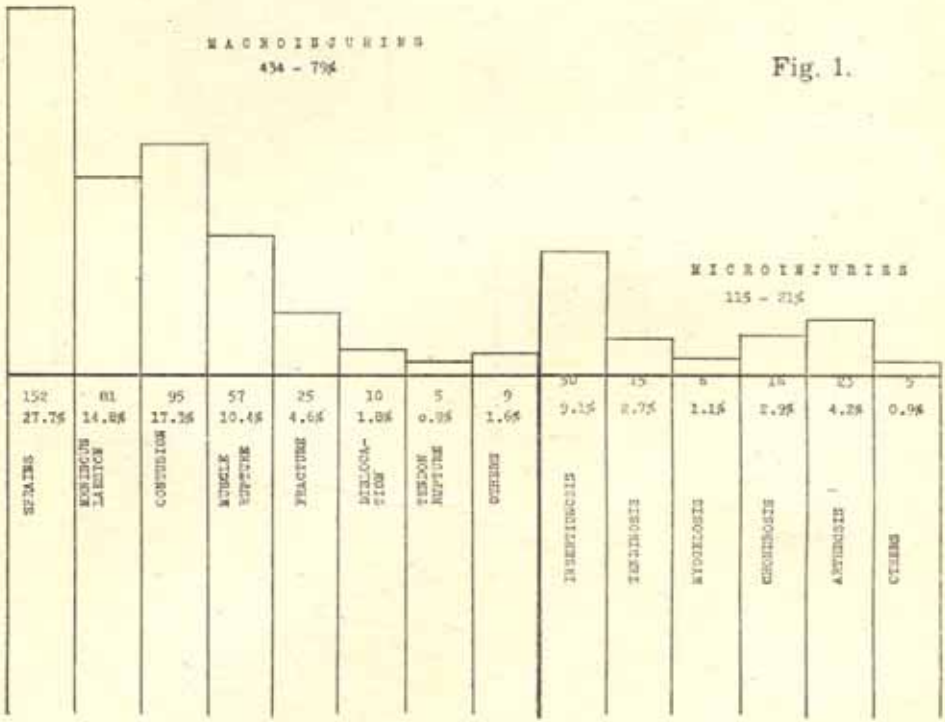

Fig. 1.

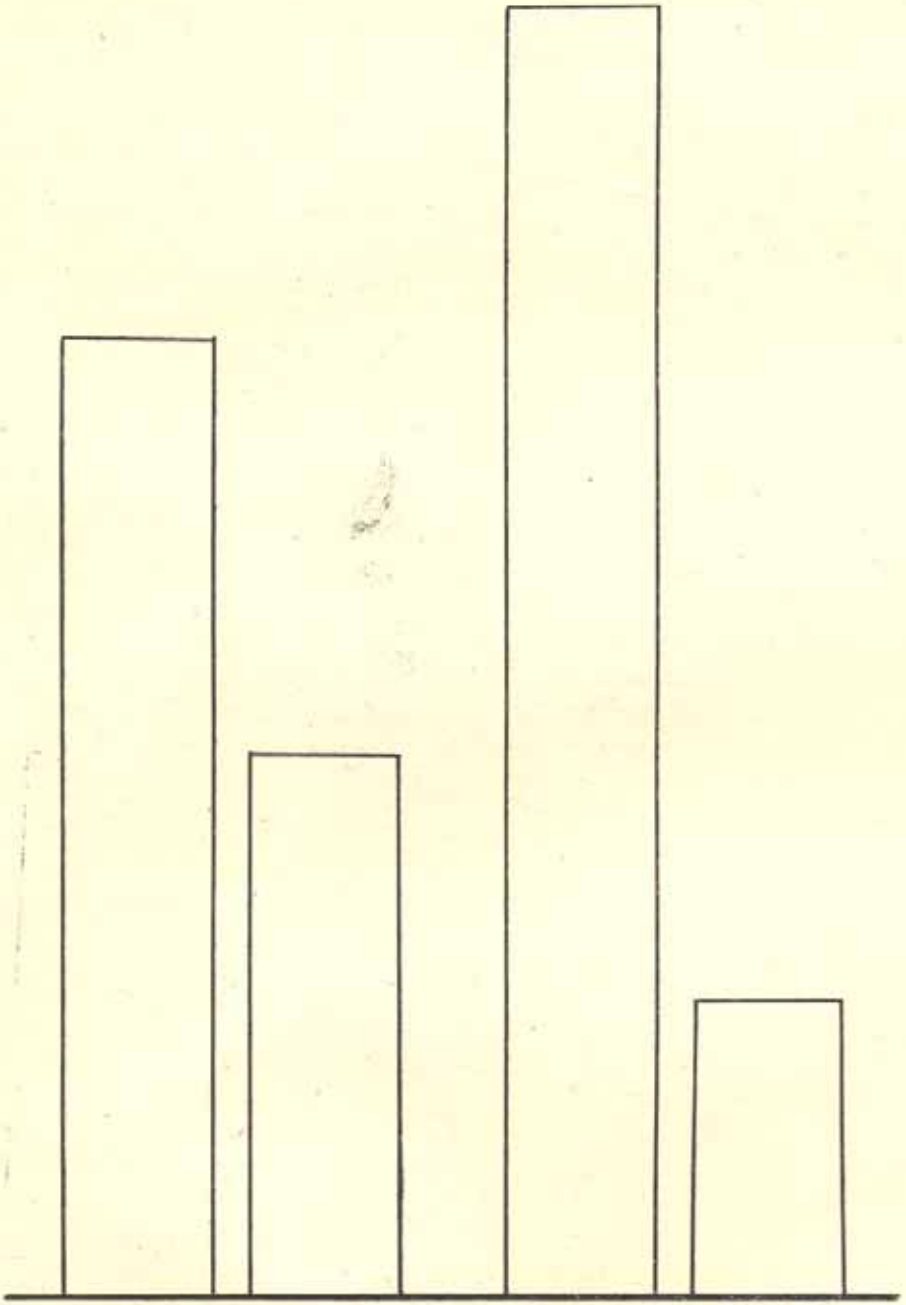
MACRO
MICRO
MACRO
MICRO
64%
36%
80.6%
19.4%
NATIONAL TEAMS
CLUB TEAMS

Fig. 2.