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Promotion of healthy lifestyle on the example of the problem of patella dislocation in athletes

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ABSTRACT

Introduction: Both in Poland and around the world, many people, especially those who regularly engage in sports, struggle with a wide variety of musculoskeletal ailments. One of them, relatively often occurring against the background of problems affecting the knee and patellofemoral joint, is the problem of patellar dislocations. Patellar dislocation is the slipping of the patella out of its proper place, which is the trochlea of the femur. The ailments mentioned above are of particular importance for athletes. To prevent this, any physical

activity should be approached with care, and effective treatment and rehabilitation methods should be implemented.

The aim of the study: The objective of the study was the presentation the case of a man dancer patient who experienced a dislocated patella during ballroom dance training and to present current methods of treatment and management of patellar dislocations in athletes based on a review of the PubMed and Google Scholar literature.

Results: The case report concerns a 21-year-old patient who suffered a first-time injury of lateral dislocation of the patella of the right knee during ballroom dance training. The patient's symptoms included severe pain, swelling and complete limitation of mobility of the right knee. An X-ray confirmed a dislocation of the patella. Based on the examination performed and the clinical picture, a diagnosis was made and an attempt was made to reposition the dislocation and appropriate treatment was administered.

Conclusions: Acute dislocation of the patella is most often caused by an injury sustained during physical or athletic activity. Management of acute patellar dislocation includes manual adjustment of the patella, checking the continuity of soft structures and possible surgical repair, and long-term rehabilitation, but it does not always disqualify from sports, even at a professional level, but nevertheless can significantly impede it.

Key words: patellar dislocation, patella, athletes

INTRODUCTION

Acute dislocation of the patella is relatively often occurring injury against the background of problems affecting the knee and patellofemoral joint that can cause significant activity limitations and long-term arthritis [1]. This affliction is most often caused by an injury sustained during physical or athletic activity [2]. Acute dislocation of the patella is the slipping of the patella out of its proper place, which is either the trochlea or the intercondylar groove of the femur. It can be caused by direct trauma through a blow to the medial part of the knee, or by indirect trauma [3]. The knee is most prone to patellar dislocation during internal rotation of the thigh relative to the foot and flexion and obliquity of the knee, along with simultaneous tension of the quadriceps muscle of the thigh. Of course, such movement does not necessarily result in dislocation in every person. This mechanism accounts for about 93% of all cases of patellar dislocation, but very often there is an additional cause for the above problem [4]. Examples include generalized joint flaccidity, patellofemoral joint dysplasia, high patellar position, lateral position of the tibial tuberosity, abnormal bone development, previous trauma [5]. Patellar dislocation occurs mainly in young, active people, and the direction in which the patella is most often dislocated is laterally [6]. Dislocations of the patella to the medial side are very rare. In addition, severe dislocation of the patella results in tearing of the medial stabilizing structures, especially the medial patellofemoral ligament (MPFL), which is almost always injured in acute patellar dislocation, usually at its attachment to the femur [7]. Such dislocations can have long-term consequences which are recurrent dislocations and even osteoarthritis of the patellofemoral joint.

CASE REPORT

A 21-year-old patient (male) suffered a first-time injury of lateral dislocation of the patella of the right knee during ballroom dance training on 29th May 2020. The patient has been training ballroom dancing since childhood at an advanced level. He holds the international dance class "S". He has never previously suffered any other acute injuries related to the musculoskeletal

system. At the age of 15, he was diagnosed with complaints of "below the knee" pain. An ultrasound revealed a shallow trochlea of the femur, which is a strong predisposition for dislocation.

After the injury, the patient was unable to move his entire right lower limb even minimally. He describes the pain he experienced as 11/10, with no loss of consciousness. At around 6 pm, he was brought to the ED by the paramedics. The diagnosis was dislocation of the patella. Limb axis normal, joint contour deformed with lateral alignment and dislocation of the patella, skin clear. X-ray (AP + lateral) of the dislocated patella, with no signs of obvious fresh bone damage.

An attempt at closed repositioning under local anesthesia was made, which proved successful. The limb was immobilized in a plaster tutor splint. It was also recommended that the limb be elevated at rest, cold compresses of the knee area, walking only on crutches without putting weight on the limb, and a follow-up at an orthopedic clinic in 5-10 days. The patient was taking anticoagulant injections and strong pain medications, as well as summed up with the drug „Structum”.

On 10th June 2020 (after about 12 days after the injury), the patient reports to the orthopedic clinic. The plaster splint was removed. An ultrasound was performed, where no ligament rupture or violation of other structures was visualized. Physical examination of the right knee showed trace increased fluid in the joint. The knee's extensor apparatus was functional. The patella is located high (symmetrically to the opposite side) and slightly lateral. Slight soreness in the projection of the medial trochlea. Compression of the patella not painful. Range of motion from 0-30 degrees, within this range of motion smooth and painless. A knee stabilizing orthosis was prescribed for a period of 6 weeks after the injury. Rehabilitation was also recommended - isometric exercises of the quadriceps muscle of the thigh and flexion of the knee joint without weight bearing to the limit of pain. An MRI scan was recommended in 6 weeks and a follow-up visit with the results of the scan. It was allowed to load the limb in a brace with one's own body weight. Resumption of dance training was prohibited before at least 6 weeks.

Despite the ban, the patient resumes training 12 days after the injury in a stabilizing orthosis gradually increasing the range of flexion, adjusting the number of degrees over a period of about two months. Swelling increases after training, but cold compresses provide relief. The patient is under close physiotherapeutic control and rehabilitates twice a day diligently performing exercises set by the rehabilitator for about two months as well. The main exercises are like:

- 1) Pulling up the knee while lying on the back to the limit of pain and lowering it
- 2) Tensing the quadriceps muscle of the thigh for a few seconds and relaxing

After 3 weeks, the patient begins to move without the orthosis, but training continues in the orthosis, as without the orthosis the patient feels that the knee is still unstable.

After a period of about 8 weeks (20th August 2020), the patient again reports to the orthopedic clinic. Orthopedic treatment and rehabilitation were completed without an MRI. The orthosis was removed. Permanent dysfunction of the right knee joint is found. No sports (especially ballroom dancing and other weight-bearing sports) were recommended for at least six months, or even a change of sports was recommended.

The patient returns to dance training on the same day without an orthosis. He feels that the right knee is more stable after rehabilitation than the theoretically healthy left knee.

Two years later, the patient wins a place on the podium in the "Rising Stars" category at the international ballroom dance tournament "Holland Masters", represents Poland at one of the largest foreign tournaments "German Open" and becomes a medalist in the Southern Poland Championships and a semi-finalist in the Polish Championships of adult pairs in amateurs.

DISCUSSION

A great many cases of patellar dislocations involve a rupture of the MPFL, so an MRI scan should be the standard after any patellar dislocation. In addition, by doing so, other risk factors for patella dislocation recurrence can be detected. A new classification of MPFL injuries after acute lateral patellar dislocation detected by MRI has also been developed as well [8].

Due to the working conditions in the ED, neither an MRI nor an ultrasound was performed in our patient's case. The X-ray performed did not visualize the soft structures for known reasons. The patient only had an ultrasound performed at the orthopedic clinic, where the continuity of the MPFL was happily visualized so surgical treatment was not needed. However, if the continuity had not been preserved, conservative treatment would not have been successful, and the time that elapsed between the injury and the visit to the orthopedic clinic could have made surgical treatment much more difficult and reduced the chance of returning to full condition, which in the case of our athlete was key.

For an acute, first-time dislocation of the patella without osteochondral changes and without serious risk factors for dislocation again, a conservative treatment plan should be used [9]. If, on the other hand, surgical treatment is necessary, reconstruction of MPFL is suggested, which results in a decrease in the risk of dislocation recurrence to 5% even in those with patellofemoral joint dysplasia [10]. There is some evidence of the superiority of surgical treatment over non-surgical treatment in primary patellar dislocation in the short term, but the quality of this evidence is very low due to the high risk of bias and inaccuracy in estimating the effect [11]. The main indications for surgical treatment for a first-time dislocation include severe cartilage damage, significant disruption of the medial stabilizers of the patella, lateral subluxation of the patella with normal alignment of the opposite knee, a second dislocation, or in patients who have not improved with adequate rehabilitation [12].

In the case of our dancer, rehabilitation had a huge impact on recovery. The patient, conscientiously performing the exercises prescribed by the rehabilitator, caused the strengthening of the stabilizing structures of the knee joint (in particular, the rectus femoris muscle), which increased the capacity of the patellofemoral joint and improved the path of movement of the patella. Gradually increasing the range of flexion angle of the orthosis was a very important part of returning to full function. If the angle was changed too much and too quickly, the expected effect of rehabilitation could fail, as any effect requires both work and time to recover.

Nevertheless, our patient did not behave responsibly by disregarding the doctor's recommendations and returning to training too quickly. The effort involved in his training is so enormous with such an injury that it could have worsened the effect of rehabilitation and brought irreversible changes to both the patellofemoral and knee joints. In addition, the dislocation may have recurred, which contributes to the occurrence of habitual dislocations. It is likely that the patient did not realize the seriousness of the injury he suffered, and the desire to realize his dreams through training was stronger than him. Fortunately, the patient made a full recovery.

CONCLUSIONS

Acute dislocation of the patella is most often caused by an injury sustained during physical or athletic activity. It can have long-term consequences which are recurrent dislocations and even osteoarthritis of the patellofemoral joint. Therefore, it is important to take appropriate action as soon as possible after the injury. This management includes manual adjustment of the patella, checking the continuity of soft structures (especially the MPFL) and possible surgical repair. Long-term rehabilitation is necessary to improve the athlete's chances of a full return to sports. A well-treated case of patellar dislocation, like many other orthopedic cases in athletes, has a great chance of success and achieving dream goals.

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