



Missed Sleeve Fracture of the Superior Pole of Patella

Nepoznaná rukávovitá zlomenina proximálního pólu česky

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SUMMARY

Patellar sleeve fracture is a form of injury in which small osseous fragments avulsed with periosteum and cartilage.

15-year-old male patient, playing in school football team, applied to our clinic with a history of previously missed patellar superior pole sleeve avulsion fracture.

Care must be taken in order not to miss the patellar superior pole sleeve fractures, which are very rare in children. Extra care must be taken in patients, whose X-ray imaging is clean but there is a problem in the extensor mechanism of the knee.

INTRODUCTION

Since the patella has high mobility and large cartilage surfaces, its fracture is very rare in children (9). Growing patella is more prone to osteochondral or avulsion fractures (8). Patellar sleeve fracture is a form of injury in which small osseous fragments fractured with periosteum and cartilage (5). Avulsion or sleeve fractures of patella can be seen in inferior and superior patellar poles. Fractures in superior pole is very rare and only a few cases have been described in the literature (2).

CASE REPORT

15-year-old male patient who plays in the school football team has applied to our clinic for the pain which occurs in the knee area during sports events. He applied to orthopaedics clinic because of an injury which he had 7 months ago during a sports event. He had swelling, tenderness and extension limitation back then. No osseous-chondral pathology has been detected in the radiographs. With the diagnosis of soft tissue injury, the patient has been given a brace that keeps the knee in extension. Medical treatment, cold compress and rest was recommended. At the end of the 4th week the brace was removed and the patient returned to the sports at the 12th week. Patellar superior pole showed mild swelling and tenderness with palpation. The extensor mechanism was intact. In the quadriceps muscle insertion point, tendinosis pathology was considered and MRI was performed (Fig. 1). A radiology doctor has reported the MRI and diagnosed a previous sleeve fracture in the superior pole of patella. Cause our patient didn't have any history of repetitive trauma, we ruled out the option of calcific tendinitis in the quadriceps insertion site on patella. The radiograph revealed a non-displaced healed osseous fragment (Fig. 2). We found that our patient had a patellar superior pole sleeve fracture as a result of our physical examination, radiological examinations and retro-



Fig. 1. MRI of the knee.



Fig. 2. X-ray imaging of the knee.

spective examination. Our patient, whose old medical documentation we couldn't reach, had a missed fracture. But since the fracture was non-displaced treatment with extension brace was correct. The patient had pain in the healed fracture site due to insistent physical activity of extensor mechanism of the knee. We treated our patient with NSAID and 3 weeks usage of extension brace. After the brace was removed, patient had 2 weeks of physical therapy for knee extensors strength and also TENS application for pain management. After the treatment, patient has returned to sports without any complaint.

DISCUSSION

Sudden eccentric contractions of knee extensors are the main injury mechanism of infantile patella fractures with immature bone structure (6). Actually, the force of extensor mechanism which can cause indirect trauma on the patella is relatively lower compared to adults. In addition, the thick cartilage layer surrounding the patella protects it from direct traumas (8). Patella sleeve fractures are a fracture form where the periosteum and cartilage that form the bone are sometimes avulsed with a bone fragment from the peripheral patella (5). Superior pole fracture is quite rare compared to inferior pole fracture and our case was a patellar superior pole sleeve fracture, which is quite rare in the literature (2, 3). Patients usually present with a sudden onset of knee pain as a result of contraction due to a sudden increase in quadriceps muscle tone due to sports activity or a fall. On physical examination; joint effusion, regional tenderness, rupture of the extensor mechanism, or limited leg limb extension due to excessive pain is important.

Grogan et al. examined 47 skeletally immature patients who had avulsion fracture of the patella. 7 of those patients had superior pole avulsion fracture. 5 of the 7 superior pole fracture patients has been examined after more than 4 weeks of their injury and they had enough extension of the knee against gravity on the initial examination. Flexion and the extension of the knee didn't differ the fragment's position. These 5 patients were treated conservatively with cast immobilization. Fractures healed without any sequela in these patients. Other 2 patients underwent a surgery, open reduction and internal fixation was done (4). Schütte et al. also described a surgical technique for patellar sleeve fractures, in which they use suture tape for augmentation and also an extension brace (7).

Our patient, who had a history of indirect trauma 7 months ago prior to the football match, was followed up conservatively with knee brace with the diagnosis of soft

tissue injury. After our evaluation we detected a previous superior patellar pole sleeve fracture in the MRI. In the X-ray we detected a non-displaced healed osseous fragment. We found that our patient had a patellar superior pole sleeve fracture as a result of our physical examination, radiological examinations and retrospective examination. Our patient, whose old medical documentation we couldn't reach, had a missed fracture. But since the fracture was non-displaced treatment with extension brace was correct. As Belman and Neviasser have stated, it is not uncommon for patellar fractures to be missed due to the high rate of cartilage in children and inadequate radiological imaging (1). Likewise, our case was missed in the first place as stated in the literature.

Care must be taken in order not to miss the patellar superior pole sleeve fractures, which are very rare in children. Extra care must be taken in patients, whose X-ray imaging is clean but there is a problem in the extensor mechanism of the knee. Therefore we recommend requesting an MRI and investigating the injury mechanism when there is a suspectable soft tissue injury, which couldn't be seen in X-ray imaging.

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