

Knee Joint Pain May Be an Indicator for a Hip Joint Problem in Children: A Case Report

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Abstract

Knee joint pain is one of the most common complaints related to the skeletal system encountered by paediatricians. Knee joint pain generally occurs as the result of hypermobility and growing pains, though disorders manifesting as arthritis/arthritis and orthopaedic problems should be considered in the differential diagnosis. A thorough and careful physical examination and laboratory and radiological findings are of importance for an accurate diagnosis. Although treatment should be based on the aetiology of the knee pain, non-steroid anti-inflammatory drugs can be used to alleviate the pain. A 7-year-old male patient presented with recurring pain in the left knee. Physical examination of the patient, laboratory tests, and radiological examination of the knee joint were normal; roentgenograms performed for a presumed hip joint problem revealed a focal cortical defect on the left femoral head and an increased effusion in the left hip joint space compared with the right counterpart. With this case report, we would like to highlight that paediatric health and diseases specialists (paediatricians) should consider hip joint pathologies when patients present with knee pain, particularly knee pain with an unidentified aetiology.

Keywords: : children, diagnosis, hip, joint pain, knee, referred pain

Introduction

Complaints relating to the musculoskeletal system represent the reasons for 6.1% of visits to paediatric clinics, and the complaint of knee pain accounts for approximately 33% of these visits (1). Anterior knee pain defines a complaint of pain in the anterior part of the knee. This complaint typically arises from the patellofemoral joint and the surrounding tissues that reinforce this joint; however, with regard to the epidemiology of and the approach to knee pain, it may occur in association with hypermobility of the knee joint (2) and osteochondrosis during adolescence (3).

Knee pain seen in children may have several orthopaedic causes. Sinding-Larsen–Johansson syndrome (SLJ), Osgood–Schlatter syndrome (OSS), patellar tendinitis, patellofemoral syndrome, fat pad syndrome (FPS), plica syndrome, lateral retinacular pain (LRP), iliotibial band syndrome (ITBS), osteochondritis dissecans, joint mouse, meniscus tear, ligament tear, and chondral injuries can cause anterior knee pain leading to internal irregularity in the knee (4). Other causes of knee pain may be diseases causing

inflammation such as juvenile rheumatoid arthritis, infection, and neoplasms. Childhood knee pain may be a sign of an orthopaedic disorder or a systemic disease, or it may be referred pain. It should be kept in mind that the actual reason for paediatric knee pain may be referred hip joint pain. In the patients with no identifiable pathology on knee examination, hip examination must always be performed. The pathologies of the hip that may lead to knee pain are developmental dysplasia of the hip, transient synovitis, slipped capital femoral epiphysis, septic arthritis of the hip, sickle cell anaemia, stress fractures of the hip, and Legg–Calve–Perthes disease (4).

Case Report

A 7-year-old male patient presented to our polyclinic with the complaints of the pain in the left knee and impeded walking beginning 2 weeks prior. His pain became worse with activity; however, sometimes he also suffered from pain during rest. The medical history of the patient revealed that he had visited an orthopaedic clinic 9 months earlier; the roentgenograms of the knee and laboratory tests were normal, and he was

prescribed non-steroid anti-inflammatory (NSAI) drugs. His pain was relieved by these drugs within 1 week. The previous medical history of the patient was unremarkable, and no other person in his family had similar complaints. On physical examination, vital signs were stable. There was no recognisable warmth, hyperaemia or swelling in the joints, but movements of the left knee and the left hip were painful. Examination of other areas was normal.

Laboratory test results were as follows: haemoglobin 12.9 g/dL, white blood cell count 11 300/mm³ (on peripheral blood smear, 58% neutrophils, 33% lymphocytes, 9% monocytes), erythrocyte sedimentation rate (ESR) 8 mm/h, antistreptolysin O titre <25 U/mL, rheumatoid factor (RF) negative, C-reactive protein (CRP) <1 mg/dL, alkaline phosphatase 243 U/L, calcium 8.4 mg/dL, and tube agglutination tests for the presence of the antibodies against *Salmonella* and *Brucella* were negative. On the radiological examination, two-sided radiographs of the left knee were normal. Anteroposterior comparative radiography of the hip was performed, followed by magnetic resonance imaging (MRI) of the left hip because of a focal lytic lesion observed on the left femoral head (Figure 1). A focal cortical defect on the left femoral head and an increased effusion in the left hip joint space compared with the right counterpart were identified (Figure 2). A specific diagnosis was not made radiologically. Needle biopsy was not suitable because of the anatomic location of the lesion, the technical difficulty, and the necessity of anaesthesia. Surgical biopsy was not performed because of the risk of avascular necrosis of the femur. The patient was recommended for follow-up for an assumed benign bone tumour (e.g., chondroblastoma or eosinophilic granuloma) in early initial stage, and the use of crutch was recommended. Treatment with NSAI drugs was started to alleviate his pain. Two months later, on clinical evaluation of the patient, his complaints had regressed; however, no change was observed on the plain radiographs. He is being followed for the hip joint pathology.

Discussion

Knee pain is a commonly encountered problem in children and adolescents, with a prevalence ranging 4%–30% (5). Diagnosis requires obtaining a careful medical history and doing physical examination because knee pain is a non-specific complaint. Localisation, character, time of onset, duration of the pain, association with activity or resting, factors that aggravate



Figure 1: Anteroposterior radiograph of the hip revealing a focal lytic lesion on the left femoral head

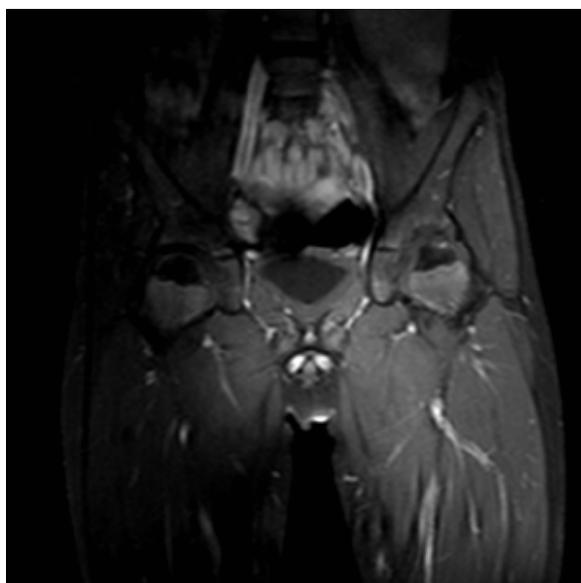


Figure 2: Magnetic resonance image of the left hip confirmed a focal cortical defect on the left femoral head and revealed an increased effusion in the left hip joint space

or relieve the pain, mechanical symptoms, neurological symptoms, trauma, inflammatory changes, haemorrhagic diathesis, and the response to analgesics must be determined. For the differential diagnosis, it is important to do a thorough and detailed examination for systemic diseases as well as local signs such as swelling, redness, and tenderness of the joint affected.

For diagnosis, complete blood count, CRP, and ESR are laboratory tests that should be completed initially; however, the results of these tests may not always be instructive. Microbiological and rheumatological tests directed to aetiology may be done using both blood and synovial fluid, when needed (6,7). The imaging method that should be used first for the diagnosis is plain radiography. In some cases, magnetic resonance imaging may be required.

Much of childhood knee pain results from hypermobility of the joint, transient synovitis, slipped capital femoral epiphysis (SCFE), or growth-related factors in adolescents (2). SCFE can present with vague knee pain in adolescents, and hip radiographs should be obtained to rule out this disease. Joint hypermobility and growth-related factors are generally self-limiting and have good prognoses. Growing pains occur in children aged between 4-8 years; occur bilaterally in the thighs, calves or behind the knee; and are generally intermittent. Physical examination and laboratory tests were normal (6). Although our patient was in the proper age range for pain relating to growth or joint hypermobility, non-organic pathologies were ruled out in the differential diagnosis because of painful movements of the left knee.

Organic causes of childhood knee pain result from orthopaedic, infectious, or rheumatologic disorders or malignancies. Septic arthritis of the knee joint, osteomyelitis, brucellosis, tuberculosis, viral infections, enteric infections, and subacute bacterial endocarditis are examples of knee pain with an infectious aetiology (8). On physical examination, systemic symptoms and arthritis signs are generally present. In laboratory tests, acute phase reactants are noticeably increased. In our patient, knee pain of an infectious aetiology was not considered because arthritis signs were not present, and the results of laboratory tests were normal.

Almost all connective tissue disorders, especially juvenile rheumatoid arthritis, vasculitis, certain systemic diseases (such as rheumatic fever, lupus erythematosus, and familial Mediterranean fever), leukaemia, lymphoma, and bone and soft-tissue tumours may manifest as knee pain, leading to arthritis/arthralgia. All of these diseases may manifest as multi-systemic

symptoms that can easily be distinguished from other pathologies by physical examination, laboratory tests, and radiological studies (6). For our patient, infectious and rheumatological diseases and malignancies were not considered because the physical examination, laboratory test results, and radiological results were normal.

Childhood knee pain may be an indicator of orthopaedic problems involving the knee and surrounding structures. Trauma is a commonly encountered problem. Patient history and radiological imaging are helpful for the diagnosis. SLJ, OSS, patellar tendinitis, patellofemoral syndrome, FPS, plica syndrome, LRP, and ITBS may also cause knee pain. In these diseases, tenderness of the tendon or at its attachment site is present, and pain occurs especially during sportive activities. Osteochondritis dissecans, meniscus tear, ligament tear and chondral injuries also cause knee pain (4). In these diseases, generally a severe trauma has occurred, and symptoms such as stiffness and locking of the knee occur. When these diseases are suspected, MRI must be done for diagnosis. Our patient had no history of trauma, he could not localise the pain exactly, and pain occurred during rest as well as during activity. Because of the characteristics of the pain, the physical examination, and the normal radiological findings, orthopaedic problems involving knee were ruled out.

Knee pain may originate from a hip pathology. Because the knee joint is a more superficial joint than the hip joint, and because the nerves of the anterior knee consist of the articular branches of the femoral, common peroneal, and saphenous nerves, a painful and tender knee joint usually indicates an anomaly in the knee (7,9). The aetiology of pain referred from the hip to the knee may be the innervation of the anterior branch of the obturator nerve or of the articular branches of the femoral, common peroneal, or saphenous nerves. However, pain referred from hip may be perceived as knee pain (10). Hip pathologies that may lead to knee pain include developmental dysplasia of the hip, septic arthritis of the hip, sickle cell anaemia, SCFE, stress fractures of the hip and Legg–Calve–Perthes disease (4). Legg–Calve–Perthes disease—an idiopathic avascular necrosis/osteonecrosis of the femoral epiphysis—usually affects 4- to 10-year-olds and peaks between 5- and 7-year-olds. Children usually present with a limp or pain in the hip, thigh, or knee. Examination of the knee is normal, but there is limited and painful rotation and abduction of the ipsilateral hip. Radiographs vary with the stage of the disease but may show evidence of bone necrosis, fragmentation,

reossification, or remodelling and healing (10). SCFE—displacement of the proximal femoral epiphysis off of the femoral neck—usually affects 11- to 14-year-olds, is more common in obese children and boys, and is bilateral in 20%–40% of cases (10). Anteroposterior (AP) and frog-leg radiographs of the hip may show widening and irregularity of the physis with posterior inferior displacement of the femoral head. On the AP view, a line drawn from the superior femoral neck (Klein's line) should intersect some portion of the femoral head (10).

In the literature, 2 childhood cases presenting with the complaint of knee pain resulting from hip pathologies have been reported. In 1 case, a 3-year-old child presented with pain localised medially on the left knee, as reported by Van Ommeren et al., and hip dislocation secondary to trauma was found (11). Similarly, Meek et al. found chondrolysis of the hip secondary to septic arthritis caused by *Pseudomonas aeruginosa* during the examination of a child who presented with knee pain (12). In our patient, recurrent knee pain was the reason for the visit to the doctor; an orthopaedic consultation was requested because the result of the physical and laboratory examinations were normal. The knee pain of the patient was related to the pathology of the hip joint; MRI revealed a focal cortical defect on the left femoral head. The patient's weight-bearing was restricted to movements supported by the clutch, and his complaints were relieved. He is still under follow-up for the hip joint pathology.

Conclusion

Childhood knee pain is a condition that requires a multidisciplinary approach. Knee pain may originate from the knee and the surrounding tissues; however, it may also be an indicator of a systemic disease or an unrelated orthopaedic problem. We conclude that examination of a patient complaining of knee pain is not complete without hip examination. We presented this case to remind physicians that hip joint pathologies can lead to knee pain and that this fact must be considered when evaluating the complaint of knee pain, which is commonly encountered by paediatricians.

Authors' Contributions

Conception and design: AEY

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Critical revision of the article: SK

Final approval of the article: TT

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