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Case Report

Asymmetrical Union of Ischiopubic Synchondrosis Mimicking a Fracture: A Case Report

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Abstract

Introduction: The ischiopubic synchondrosis (IPS) is a temporary joint between the ischium and pubic bone. It ossifies during maturation, usually until early adolescence. Asymmetrical closure of the synchondrosis is not uncommon and can mimic infection, tumor or stress fracture during radiological examination.

Case Report: We present an 8 years old boy, who sustained a RTA. His initial x ray was diagnosed as a fracture since there was a gap in the left ischiopubic synchondrosis. Appropriate clinical evaluation and assessment revealed that the asymmetrical gap was the normal IPS. No further examinations were required. Follow up x-ray, confirmed the diagnosis with the normal ossification process of the IPS.

Conclusion: We draw attention for the asymmetrical closure of the IPS. The radiological appearance of IPS may mimic a fracture. It is a benign condition, where only observation is required.

Keywords: *Ischiopubic Synchondrosis; Fracture; Van Neck-Odelberg Disease; Osteochondrosis*

Abbreviations

IPS: Ischiopubic Synchondrosis; RTA: Road Traffic Accident

Introduction

Asymmetrical enlargement of ischiopubic synchondrosis (IPS) often is a source of diagnostic dilemmas when investigating children with limping and pain in the hip region. The ischiopubic region is formed from two ossification centers superomedial pubic center and inferolateral ischial center. They may fuse gradually with symmetrical configuration but asymmetrical fusion is not an exception. In unilateral involvement, cartilaginous fusiform enlargement may appear until permanent bony union. This can be an incidental finding during radiological examination for pathology in the hip region. When associated with pain or clinical evidence of restricted movements, the benign osteochondrosis of the IPS, referred as Van Neck-Odelberg disease, can cause dilemmas for differential diagnosis from infection, stress fracture or tumor [1-4].

We present an 8 years old boy who was involved in a RTA. On x-ray examination of his pelvis, there was a gap in the ischiopubic area on the left that was diagnosed as fracture. Appropriate clinical examination and careful radiological assessment made the diagnosis of asymmetrical IP synchondrosis. Thus we avoided further investigations and treatment. According to our knowledge, it has not previously reported IPS as an acute fracture.

We want to draw attention for the description of the normal ossification process of IPS that can mimic a fracture in children.

Case Report

An 8 years old child was involved in a severe road traffic accident, sitting in the rare seat of a car, without a seatbelt. His parents were injured and all of them were transferred in a district hospital for treatment. He had an x-ray examination AP and frog position of his pelvis. On x-rays on the left ischiopubic junction there was a gap, while on the right there was normal ossification of the ischiopubic rami. This was diagnosed as a fracture and the boy was admitted for hospitalization. No other fracture was detected.

Next day the boy was transferred in our pediatric orthopedic clinic. On clinical examination there was a pain free complete range of movements for both his hips. The boy could stand and walk without discomfort apart from hesitating because of the dizziness from his accident. Reviewing his x-rays, on the left side there was a gap in the ischiopubic junction similar at first inspection as a fracture.

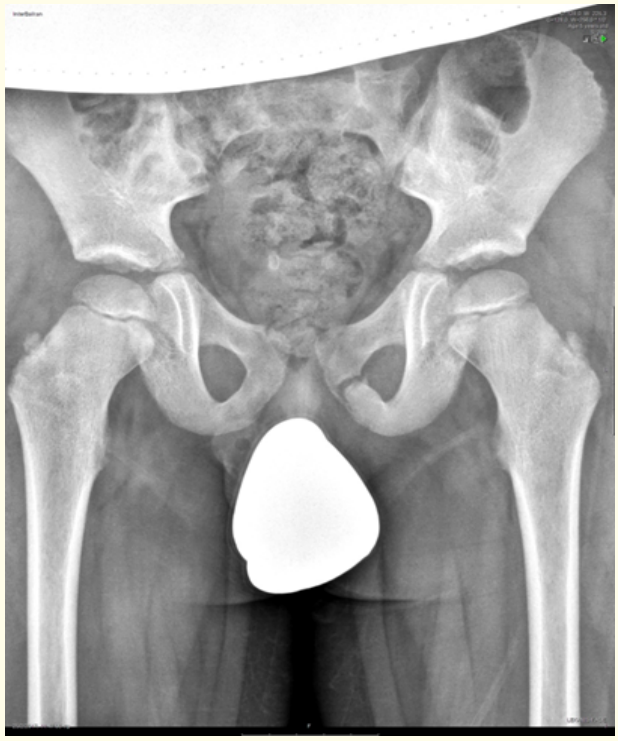

Figure 1: *Initial x ray after the accident, with a gap in the IPS junction, on the left side.*

But with careful x ray evaluation there was a cystic type of lesion in the left IP junction. The edges of the bones involved were rounded, with elements of sclerosis on both sides. There was a thin ossified smooth line connecting the bones on the inner area of the gap. There

was no enlargement of the synchondrosis. The right side had complete union of the IP junction, with normal bone configuration. No further investigation was performed and the boy was left free to return in his daily activities.

5 months later the boy had another x-ray with signs of uniform symmetrical enlargement of the synchondrosis, with characteristic diffuse ossification, just before the union of the left side. The boy remained symptom free, participating in his regular activities. He was able to hip hop in both legs, his dominant leg with which he was kicking the ball, was the right one. He was discharged from our clinic.

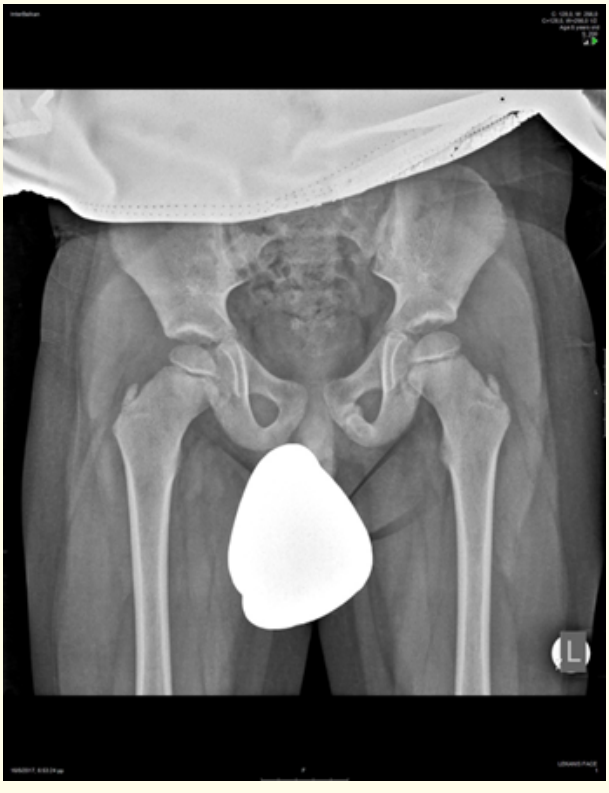

Figure 2: *New x-ray 5 months later, with enlargement of the left IPS junction, with ossification of the initial gap.*

Discussion

Ischiopubic synchondrosis is a temporary joint between the inferior ischium and pubic ramie. It is formed from hyaline cartilage and fibrous tissue. With normal development it undergoes bony fusion and disappears, forming the inferior obturator rami. In early ages, younger than 5 years, the two bony ends are well separated with cartilage plates and there is symmetrical appearance of the left and right side. The bone edges are in line with smooth edges. When fusion starts, the bony ends become enlarged and are irregular. There is a tumor like appearance with a cystic type lesion. As the fusion continues, IPS becomes enlarged, with irregular ossification. The calcification process appears with normal linear alignment, connecting ischium and pubic bone, with absent periosteal reaction [1,2,5].

The younger the fusion starts, the more symmetrical is the radiological appearance of union. In older children (older than 8 years) asymmetrical union is not uncommon. The ossification of the synchondrosis is an asymptomatic process. But when this asymmetrical ossification is found in a radiological examination, for children with hip pain and limping, it creates a source of doubtful diagnosis. Even in asymptomatic children, when it is found incidentally on x-ray, this tumor like appearance presents a diagnostic dilemma [4].

Hubner described the enlarged IP synchondrosis that is formed for hyaline cartilage. As it starts to fuse, it creates a smooth surface with a cleft in between. Keats described this as a temporary joint [5,6].

Herneth., *et al.* in a cohort of 32 patients described the asymmetrical closure of IP synchondrosis. In 9 of them there was asymmetrical involvement. They correlated this finding with foot predominance, explaining the action of muscles as an increased mechanical stress that prolongs the fusion of the joint [2].

Oliveira described a left unilateral enlargement of the IPS joint with a tumor like appearance. After a period of conservative treatment, they proceeded in surgical intervention, with curettage of the cystic lesion that revealed enchondral ossification and woven bone, suggesting a stress fracture. It healed after conservative management avoiding sport activities [7]. Jose., *et al.* in a 12 years old competitive runner reported on the unilateral enlargement of the IPS, that was diagnosed as a stress fracture based on the MRI findings, with bone edema and irregular low sign intensity with absent soft tissue mass and fluid. Marrow sign abnormality is the result of normal ossification during the fusion process [8].

This fusion process may be occasionally painful, resembling cases of osteochondritis. This enlargement was described in 1923 from Odelberg and a year later from Van Neck and is known as Van Neck - Odelberg disease. In a 12 years old boy, recently, Chaudhari., *et al.* reported the use of CT scan and MRI, after the initial x-ray, in order to confirm the diagnosis. On x-ray there was a sclerotic shadow in the size of a cherry. They used non-steroidal anti-inflammatory medication and bed rest for the treatment of their patient [3]. Macarini., *et al.* reported 2 patients of 8 and 12 yrs old. CT scan studies defined the edges of synchondrosis with sclerosis and irregular edges [4].

Wait., *et al.* compared findings of 10 patients with osteochondrosis of the IPS with similar finding in patients with hematogenous ischiopubic osteomyelitis. The mean age of patients was 7 years. Apart from the blood tests that were indicative of infection (ESR, CRP and positive blood cultures), MRI findings were distinct where abscess, fluid collection and edema of muscles were characteristic for infection. Marrow edema and enhancement of adjacent soft tissue was found in the IPS osteochondritis. These findings are indicative of IPS osteochondritis but are not specific [1,9]. Stormacq., *et al*. in a 3 years old patient, initially diagnosed as a transient synovitis of the hip, because of persistence of symptoms, using MRI, ended with the diagnosis of IPS osteochondrosis, despite the symmetrical findings in the IPS in their x-ray [10].

Cystic type lesions, as was the initial x-ray finding in our patient, may be confused as chondral tumors. Their appearance with patchy calcification and abnormal ossification has different characters than what was found in our patient. But it is the characteristic anatomic location in the ischiopubic synchondrosis that reassures for the benign condition. The same radiological appearance in a different anatomic location should have undergone further accurate investigations.

Conclusion

Our patient had an x-ray with similar findings of a fracture, since he was involved in a RTA. His clinical examination revealed the absence of pain and absence of movement restriction. The anatomical junction of ischium and pubic bones is a synchondrosis that in the beginning of the fusion process may appear as a type of fracture. We simply observed our patient, with the ossification of the IPS with no treatment and avoiding unnecessary examinations.

Conflict of Interest

None of the authors have any financial interest or any conflict of interest.

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