Ischiopubic synchondrosis as a case of non specific groin pain in a 12 year old football player

F. Van Ongeval, W. Sabbe, K. Peers
Department Physical Medicine and Rehabilitation, UZ Leuven, Belgium

ABSTRACT

A 12 year old football player presented with non specific groin pain at the ischiopubic synchondrosis (IPS). IPS is the temporary junction between the inferior ischial and pubic branch, which obliterates before puberty during skeletal maturation. As a consequence to asymmetric mechanical stress, unilateral IPS stress reaction typically occurs at the non-dominant leg of prepubescent athletes. On conventional radiography, the tumor-like lesion at the IPS can become a diagnostic challenge. A typical MRI feature defined as “fibrous bridging”, as well as patient’s history, age and other characteristics can be helpful in the differential diagnosis of non-pathologic IPS stress reactions. Chronic groin pain in young athletes needs further investigation. However, it is important to acknowledge the non-pathologic condition of IPS, and invasive diagnostic examination and therapy should be avoided at all time. Based on this clinical case, we emphasize the diagnostic work up and conservative management of IPS.

Keywords: Synchondrosis; osteochondrosis; stress reaction; fibrous bridging

INTRODUCTION

A synchondrosis is a cartilaginous joint that consists of two bony ends covered by hyaline cartilage with fibrous tissue within. This category of joint can be permanent (for example the first sternocostal joint) or temporary (for example the ischiopubic synchondrosis). Temporary joints occur uniquely during physiologic development. With skeletal maturation the synchondrosis becomes thinner and usually obliterates by bony union and disappearance of the hyaline cartilage.

Osteochondrosis is a pathologic condition defined as a focal disturbance of endochondral
ossification. Osteochondrosis is characterized by the disturbance of the blood supply of the bone leading to a localized necrosis of the bone followed by regrowth of the bone. In general osteochondrosis can be classified in 3 different types. Firstly there are articular osteochondrosis like osteochondritis dissecans, Kienböck's disease, Köhler disease, Freiberg's disease, Panner's disease and Legg-Calvé-Perthes disease. Secondly Sinding-Larsen-Johansson disease, Osgood-Schlatter disease and Sever's disease are examples of nonarticular apophyseal osteochondrosis. Lastly there are nonarticular physeal osteochondrosis as Scheuermann disease and Blount disease. Some authors position the ischiopubic synchondrosis (IPS) in this last-mentioned category.

IPS is the temporary junction between the inferior ischial and pubic branch. The synostosis of IPS is a physiologic maturation that typically begins in early childhood and is completed before puberty. In 80 percent of the children, the IPS fuses bilaterally before the age of 12 years. In younger children IPS commonly occurs bilaterally, as the induction of the fusion in the pelvis is symmetric. Later, as children approach puberty, a unilateral IPS is more common.

In some cases, a unilateral IPS, as consequence to overload and stress, can provoke a non-specific clinical presentation of groin/buttock pain and restriction of hip mobility. These symptoms of IPS were first reported in a differential diagnosis of a tumor-like lesion on radiographic evidence by Odelberg (1923) and Neck (1924). Later, uni- and bilateral IPS were described in the literature as a physiologic process of skeletal maturation in children. In this article we report a case of a young football player with a symptomatic unilateral IPS stress reaction.

CASE REPORT

A 12 year old boy, competitive football player, presented with non-specific groin pain at the left side. The complaints lasted for over 2 years and were progressive. The pain had a rather mechanical character and was evoked especially during sport activities. The past two months, the patient had rest due to the football summer break. Nevertheless, at the start of the new football competition, he had to stop football training because of a severe recurrence of groin pain.

Clinical examination showed a restriction of hip mobility, with more specifically a painful end grading internal rotation. Palpation of the left ischial tuberosity and the ischiopubic ramus caused pain. Patrick-Kubis test was positive at the left side. The hip adductor tendons were very tender at their insertion to the pubic bone. The hamstrings and iliopsoas muscles were bilaterally shortened. Strength and sensitivity were normal. He had no systemic symptoms such as fever, and no superficial inflammatory signs around the hip or pelvis.

Pelvic anteroposterior radiography revealed an asymmetric and irregular bony exostosis at the left inferior ramus (Figure 1A). Magnetic resonance imaging (MRI) illustrated a remarkable low signal intensity intramedullary line at the left ischiopubic ramus, surrounded by reactive edema and cortical expansion (Figure 1B, C, D).

Based on clinical presentation and radiographic findings, a stress reaction of the ischiopubic synchondrosis was diagnosed.

The patient was treated conservatively with adjusted physiotherapy with core stability training and a program to strengthen the pelvic musculature. The patient was not prohibited from practicing sports. On the contrary he was stimulated by resuming it, however he was asked to avoid high impact and painful activities.

DISCUSSION

Unilateral enlarged IPS with non-specific clinical presentation and a tumor-like lesion on conventional radiography can be a diagnostic challenge and further investigation is certainly required. The differential diagnosis in painful IPS reported in the literature includes insertional adductor tendinopathy, neoplasia, post-traumatic osteolysis, osteomyelitis and stress fracture.
MRI studies seem to be helpful in the differentiation of IPS from other pathological conditions, because of its excellent ability of tissue characterization. Most frequently MRI findings such as signal alteration of the bone marrow and fusiform swelling of the adjacent soft tissue, which indicates hyperemia and edema, were observed in our patient (Figure 1B, C, D).

A typical feature of IPS stress reactions, defined by Herneth et al. as “fibrous bridging” is a hypo intense band-like structure perpendicular to the pubic axis (Figure 1B, C, D). If MRI study illustrates “fibrous bridging” in the pelvis of a prepubescent child, the radiographic findings strongly suggest a non-pathologic IPS. In adult athletes with sustained excessive physical activity and in patients after radiation therapy a unilateral IPS at this particular location can also occur.

Accordingly, a stress reaction as “fibrous bridging” can be differentiated from an insertional adductor tendinopathy, thanks to its radiographic appearance and patient’s characteristics. Bone scintigraphy was not performed in this case, but normally demonstrates a high bone turnover at the ischiopubic area due to active bone formation. Uptake is usually seen in pathologic conditions like osteomyelitis and neoplasia, but should only be considered abnormal if it is greater than the value of the triradiate cartilage.

Due to asymmetric mechanical stress of the adductors, iliopsoas, gemelli and quadratus femoris muscles over each hemi pelvis during sports, a stress reaction originates, often complicated with

FIGURE 1. A: Anteroposterior radiograph of the pelvis shows asymmetric and irregular bony exostosis at the left inferior ramus (arrow). B, C, D: MRI of the pelvis reveals a low signal intensity intramedullary line at the left ischiopubic ramus, surrounded by reactive edema and cortical expansion (arrow). T1 weighted coronal image (B) and sagital (C) and coronal (D) T2 weighted images.
a delayed union or a stress fracture (in older individuals). This hypothesis is supported by distinct findings of histology and contrast enhanced MRI studies. Herneth et al. implicated increased mechanical strain produced through the hamstrings of the non-dominant, weight-bearing leg of athletes, like the young football player in our case report.

Following this logic a mechanical strain more than a focal disturbance of endochondral ossification as in osteochondrosis causes the hyperostosis in IPS. For this reason we prefer to use the semantic term synchondrosis instead of osteochondrosis or osteochondritis.

CONCLUSION

Unilateral enlargement of the IPS can be a diagnostic challenge due to a non-specific clinical presentation of chronic groin/buttock pain. As a result of asymmetric mechanical strain of hemipelvis muscles (e.g. quadratus femoris muscle, adductors, iliopsoas, gemelli and hamstring muscles) at the weight bearing leg during sports activities, a stress reaction of IPS occurs typically on the non-dominant side.

Radiography can be helpful in differential diagnosis. Conventional radiography shows a tumor-like lesion. A characteristic MRI feature of the IPS stress reaction, defined as “fibrous bridging” is a hypo intense band-like structure perpendicular to the pubic axis with broadening of both bony ends of the ischiopubic branch. Furthermore, high resolution MRI should be the first choice to rule out other pathological conditions.

Chronic groin/buttock pain in a prepubescent child needs further investigation. However, enlargement of the IPS, without clinical symptoms and a history of trauma or positive laboratory findings is a physiologic appearance during skeletal maturation and invasive diagnostic examination and therapy should be avoided at all time. Long term studies about conservative treatment with adjusted physiotherapy are rare and further investigation is needed.

REFERENCES