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The Pelvic Digit: A Rare Congenital Anomaly as a Cause of Hip Pain

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What to Learn from this Article?

Insight into existence of entity called Pelvic digit or Pelvic horn

How to differentiate Pelvic digit from lesions like osteochondroma?

Abstract

Introduction: The pelvic digit or pelvic rib is an unusual congenital anomaly with a finger or rib like bone formation in soft tissues around normal pelvic skeleton. This is a benign lesion and mostly an Incidental finding on radiographs. Most reported cases are asymptomatic and do not require intervention. We report a case of symptomatic pelvic rib that required surgical excision.

Case Report: A 57-year-old man presented with a long history of pain and functional limitation in his right hip. On plain radiographs a fusiform bony structure adjacent to the acetabulum was noted. The imaging tests (MRI and CT) suggested the diagnosis of pelvic digit. We performed surgical excision of the lesion through anterior Smith-Peterson approach. The histopathology showed presence of corticomedullary structure. After surgery the patient's symptoms were relieved.

Conclusions: It is important to recognize this lesion on plain radiographs and to confirm by CT scan and make differential diagnosis. In the majority of cases the pelvic digit is asymptomatic and no treatments is needed. However in cases where symptoms can be attributed to pelvic digit an excision will relieve the pain and disability.

Keywords: Pelvic digit, pelvic rib, iliac rib, bone growth and development

Introduction

The pelvic digit, pelvic rib or pelvic finger is an unusual congenital anomaly in which there is bone formation in the soft tissue around the normal skeleton of pelvis. This lesion is benign and usually asymptomatic and for this reason is detected incidentally in majority of cases [1-10]. Plain radiographs show a bony structure similar to rib or a finger with a clear cortex and medulla arising from pelvis. Sometimes there may be a characteristic pseudo-articulation at its base [9]. Due to benign nature of pelvic rib, it is necessary to diagnose accurately. Asymptomatic lesion will require no treatment and accurate diagnosis may avoid unnecessary interventions [11]. Most reports have described an asymptomatic pelvic digit we report a symptomatic case which required surgical intervention.

Case Report

A 57-year-old man presented with a long history of groin

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Author's Photo Gallery


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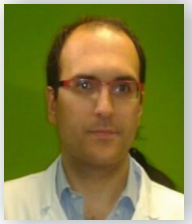
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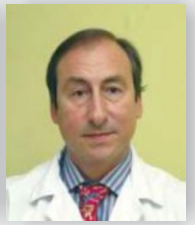
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Authors	Year	n	Symptoms	Surgery	Results
Maegele [6]	2009	1	Chronic pain and tenderness in the hip with functional impairment in abduction and external rotation	Surgical excision	No symptoms and complete range of motion
Pandey et al [7]	2009	1	Chronic hip pain of six -year duration. Patient was unable to sit cross -legged and had difficulty in climbing stairs and squatting	Surgical excision	Hip movements improved, and pain was relieved
Evangelista P [15]	2011	1	Dyspareunia and difficulty in walking	Surgical Excision	Dysparenunia relieved and walking imporved
Moreta et al	2012	1	Chronic hip pain and limited range of motion with slight Trendelenburg gait.	Surgical excision (Smith-Petersen approach)	Asymptomatic with improvement in range of motion

Table 1. Literature review of Pelvic digit cases which required surgical intervention

pain for several years. There was no history of trauma or injury to groin. The pain exacerbated by walking and prolonged sitting. Since last few months his pain had increased with loss of movement at the hip. Physical examination revealed slight asymmetry in the region of the iliac bone compared with the contralateral side, with no signs of inflammation or palpable mass. Hip range of motion was decreased with flexion limited to 90º, and abduction of 15º. Patient walked with Trendelenburg gait possibly because of pain. Conventional radiographs of the hip (Fig.1A) revealed the presence of a bony protuberance at the right anterior inferior iliac spine, several centimeters in length close to the right acetabulum, with no signs of joint degeneration. Suspecting a giant osteochondroma which could be in the process of malignant transformation we performed a magnetic resonance imaging (MRI) which showed the existence of a bone tumor with benign appearance, but excluding the osteochondroma as a diagnostic possibility, because there was no peripheral cartilage. Subsequently a CT scan (Fig. 1B) revealed a bony lesion (6 cm long and 3 cm thick) with a well-defined cortical bone and a heterogeneous zone in the junction with the ilium suggesting a pseudo-articulation. With these studies we could establish the diagnosis of pelvic digit instead of an osteochondroma.

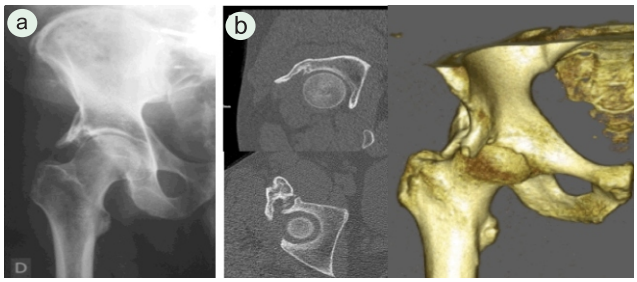

Figure 1. A. Conventional radiography showed the pelvic digit adjacent to the right hip. B. Computed tomography including the coronal view (up), the axial view (down) and the tridimensional reconstruction.

Initially, non-steroidal anti-inflammatory medications were prescribed with no symptomatic improvement. Surgical excision of the pelvic rib was planned with consent of the patient. Anterior approach to the hip (Smith-Petersen) was used. Tensor fascia latae and gluteus minimus required to be partially detached to completely expose the 'rib' till the base. The 'rib' was resected from its base and samples send for histopathology (Fig. 2). Histopathological examination showed the presence of corticomedullary structure similar to a rib, with no accompanying cartilage; this finding was consistent with a pelvic digit.

The pain disappeared gradually after surgery, and a year later the patient remains asymptomatic, with an improvement in flexion (130°) and abduction (35°) of the hip; the radiograph (Fig. 2b) shows no radiological signs of recurrence after one year (Fig. 3).

Discussion

In medical literature, few cases of pelvic digits or pelvic ribs have been reported. This lesion was first reported by Sullivan and Cornwell [1] in 1974 in a 15-year-old girl with a bone formation curved caudad toward the right side or the distal sacral vertebra but was not directly attached to the sacrum. The histological work-up revealed

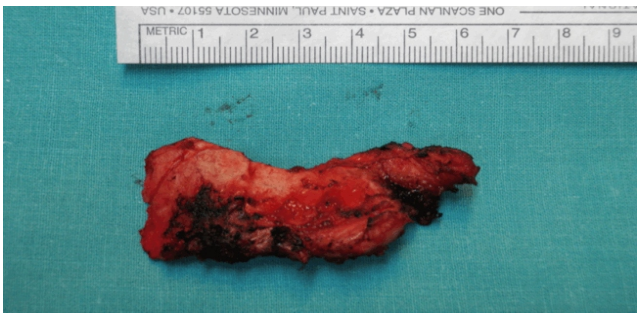

Figure 2. Pelvic digit after complete removal.

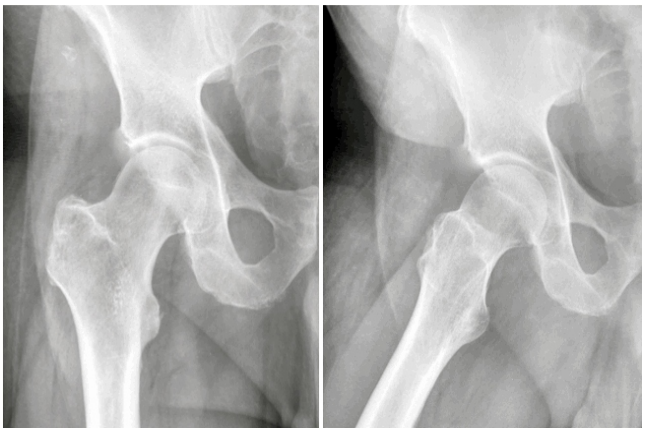

Figure 3. Conventional radiography showed no recurrence of the lesion after one year.

a structure similar to a rib. These authors thought that the anomaly had originated from the first coccygeal vertebra. Subsequently, other authors hypothesized that the anomaly could arise from the displacement of a rib or sternal center, or from the ossification center at the anterior superior iliac spine [2]. However, the most plausible explanation seems to be a failure of apoptosis of the mesenchyme for the anterior and lateral costal process. In the third week of embryological development, cells of the mesoderm capable of bone formation migrate from the primitive streak to the area of the future coccyx, pelvis and abdominal wall. In normal development of the rib, the posterior zone of the rib creates as a costal process attaching with the vertebral body, but in the pelvis, the costal process mesenchyma degenerates as a consequence of the process of apoptosis [3]. A failure of this programmed cell death would make the formation of bone possible in these areas, developing a shape and a histological structure similar to a rib.

Some authors have described the morphology of this bone protuberance as a pelvic rib[1], while others prefer to define it as a pelvic digit[2,3,4] because this lesion can develop one or more pseudo-articulations, resembling the appearance of the phalanges of the fingers. In our case, there are no pseudo-articulations in the body of the ossification, but one pseudo-articulation was at the site of origin in the pelvis. There have been reports in other anatomical locations: ilium, sacrum, coccyx, pubic symphysis, last rib, hip, and even in the abdominal wall [6]. Moreover, cases of bilateral lesions have been described [4]. Recognition of this benign lesion could be done with plain radiographs and CT scan [5,8,9] shows the presence of cortical bone and confirms the diagnosis. Differential diagnosis of a pelvic digit comprises osteochondroma, myositis ossificans or heterotopic bone formation, Fong disease (Nail-Patella Syndrome) and also bony avulsion because it can generate an ossification in its path [6,10]. Osteochondroma is continuous with underlying bone (CT scan is very useful to reveal this feature) and a typical cartilaginous cap may be present (MRI is the best imaging technique for this purpose) [12]. Myositis ossificans is related to history of trauma and the radiological appearance shows heterogeneous density without well-corticated structure. Additionally, CT scan would confirm the absence of cortical bone [13]. Finally, Fong disease is an entity that is inherited as an autosomal dominant, with nail and skeletal anomalies, where the appearance of "iliac horns", usually bilateral, is considered pathognomonic [14].

The pelvic digit is a casual radiological finding in majority of cases. It is usually asymptomatic and does not require intervention. But sometimes it can generate mechanical pain or functional impairment by proximity to joints like the hip or other structures of perineum. In that case a surgical resection could be performed. To best of our knowledge, there are only four reported cases of symptomatic pelvic digit[5,6,7,15] and three of them required surgical intervention (Table 1). Thus these can occasionally cause pain and disability and surgeons should be aware of this particular entity.

Conclusion

This case has a particular interest because the pelvic digit is usually asymptomatic and is often incidentally detected and, for this reason, in the majority of cases surgical intervention is not needed. The current patient presented chronic pain and functional impairment of his hip and surgical removal restored good range of motion with relief of his symptoms. It is important to recognize this lesion by plain radiographs and to confirm by CT scan and make differential diagnosis, which should include other causes of heterotopic bone formation and bone tumors.

Clinical Message

The pelvic digit is an uncommon congenital benign bony lesion with corticomedullary structure, usually arising from the pelvis, and it is important to differentiate among other bone formations. Surgical removal is indicated only if symptoms such as hip pain or limited range of motion are disabling the patient.

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