PELVIC RIB OR PELVIC DIGIT: A SERIES OF CASES

Costilla o dedo (falange) pélvico: una serie de casos

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Summary
The pelvic digit is a benign entity resulting from an abnormality in bone development, where a bony structure with a characteristic radiological appearance is found in the soft tissues, especially in relation to the hip joint, although it may be found at other locations. It is usually asymptomatic and is found as an incidental finding. Knowing its origin and imaging characteristics is of great importance to differentiate it from other injuries such as post-traumatic ossification or avulsion injuries, which are frequent in this same location. Six cases, from the institution, with incidental finding of pelvic digit in different diagnostic modalities are presented.

Resumen
El dedo (falange) pélvico es una alteración benigna resultante de una anomalía en el desarrollo óseo, donde se encuentra una estructura ósea con apariencia radiológica característica en los tejidos blandos, especialmente en relación con la articulación coxofemoral, aunque puede tener otras localizaciones. Se trata de una entidad benigna que usualmente es asintomática y se encuentra como hallazgo incidental. Conocer su origen y características imaginológicas es de gran importancia para poderla diferenciar de otras lesiones como osificaciones postraumáticas o lesiones por avulsión, que son frecuentes en esta misma localización. Se presentan seis casos con hallazgo incidental de dedo pélvico en diferentes modalidades diagnósticas.

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Introduction
The pelvic finger or pelvic rib is considered a rare congenital anomaly of bone development; it may be associated with one or more pseudoarticulations and the iliac bone is the most frequent site of onset. In most cases it is found as an incidental finding, with no pathological significance; however, it may manifest with low back pain or chronic hip pain, which is why it is important that the radiologist is familiar with their typical and atypical forms of presentation, as well as with the most important features, in order to achieve the appropriate diagnostic approach that results in convenient management and improvement of the quality of life of symptomatic patients.

Methodology
This study corresponds to a series of case reports of patients in whom an incidental imaging diagnosis of a pelvic finger or phalanx was made. Data were collected from six patients, after a review of the PACS system, in a period of six months and the images made correspond to: radiography (siemens Multix Top), computed tomography (General Electrics VCT light speed 64 detectors) and magnetic resonance (General Electrics Signa 1.5T).

Ethics Committee
According to Resolution 8430 of 1993 this project is classified as research without risk, since it is a study that employs retrospective techniques and methods of

documentary research and no intervention or modification of the biological, physiological, psychological or social variables of the individuals is carried out.

All the information obtained from the clinical histories will be handled solely by the researchers, as confidential information and at no time will the name of the patients or any type of data that may reveal their identity be made public. In order to guarantee the anonymity of the patients, the database will be encrypted, without any variable that identifies them, and will be stored in a USB with a password, and a copy of the database will be kept in the Service's computer.

This study adheres to the postulates of the Declaration of Helsinki as it complies with confidentiality guidelines, and does not require informed consent, does not involve any intervention in patients and the protocol will be reviewed by the staff of the Clinical Studies and Clinical Epidemiology Branch and by the Corporate Research Ethics Committee of the Santa Fe de Bogotá Foundation.

The data obtained from the participants of this research will be used only to meet the objectives of the same.

- Case 1. Male patient of 65 years of age, asymptomatic, who has a hip radiography to follow up lytic lesions in the pelvis due to neoplastic involvement secondary to resected prostate cancer (Figures 1 and 2).

- Case 2. Male patient, 56 years old, with no relevant antecedents, consulting for a clinical picture of 6 months of evolution consisting of left hip pain that is exacerbated with movements and gives way at rest (Figures 3 and 4).

- Case 3. 53-year-old male patient who consulted for a 3-month history of right groin pain radiating to the leg. Denies relevant antecedents (Figure 5).

- Case 4. 49-year-old male patient consulting for abdominal pain. As part of the ER study, a CT scan of the abdomen was performed and a pelvic finger was found as an incidental finding, unrelated to the clinical picture (Figures 6 and 7).

- Case 5. 33-year-old male patient referred for right hip MRI for persistent pain with no history of trauma (Figures 8, 9 and 10).

- Case 6. 56-year-old male patient undergoing skeletal serial study as part of the multiple myeloma assessment. An incidental finding was a completely asymptomatic pelvic finger (Figure 11).

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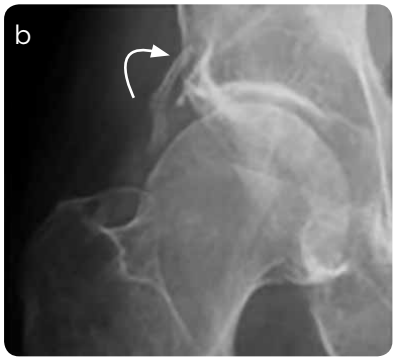

Figure 1. a) Antero-posterior radiography of the hip: extensive lytic involvement of the left acetabulum due to metastasis of already known prostate cancer (straight arrow) is observed. b) Approach of the right hip: an ossified linear image is identified towards the lateral aspect of the acetabulum with a pseudoarticulation that gives it an appearance similar to that of a phalanx, a common finding in the pelvic finger (curved arrows).

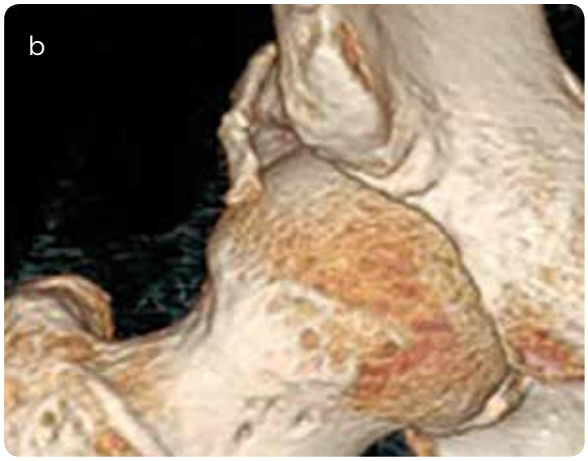

Figure 2. a) Tomographic cut and b) three-dimensional reconstruction: the lesion and pseudoarticulation are more clearly identified. Additionally, it is clearly observed how this bone segment is articulated with the acetabular roof.

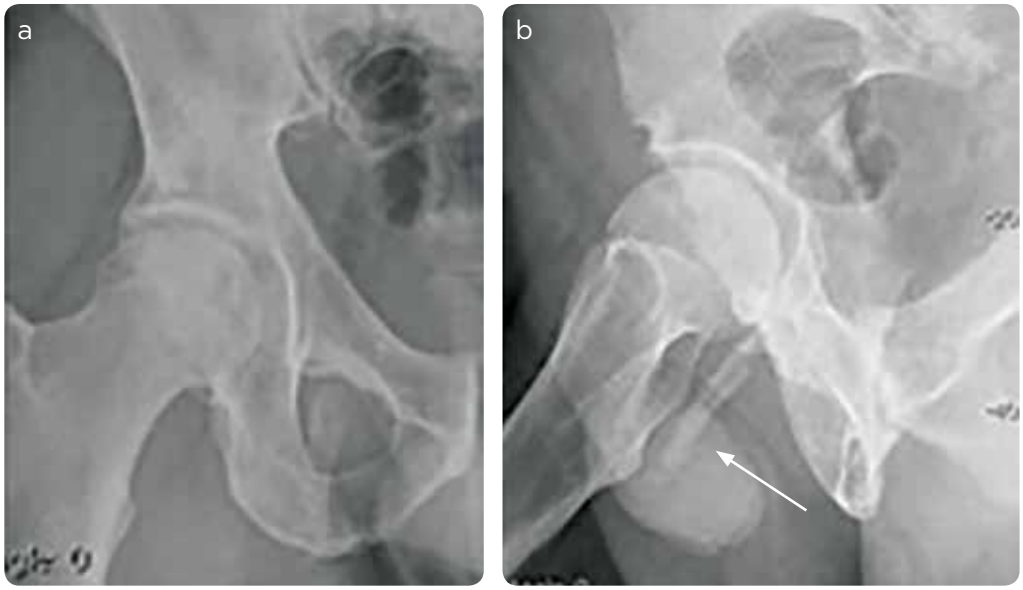

Figure 3. X-rays of the right hip, projections a) anteroposterior and b) lateral: an ossified linear image is observed in the anterior aspect of the hip joint, over the obturator hole.

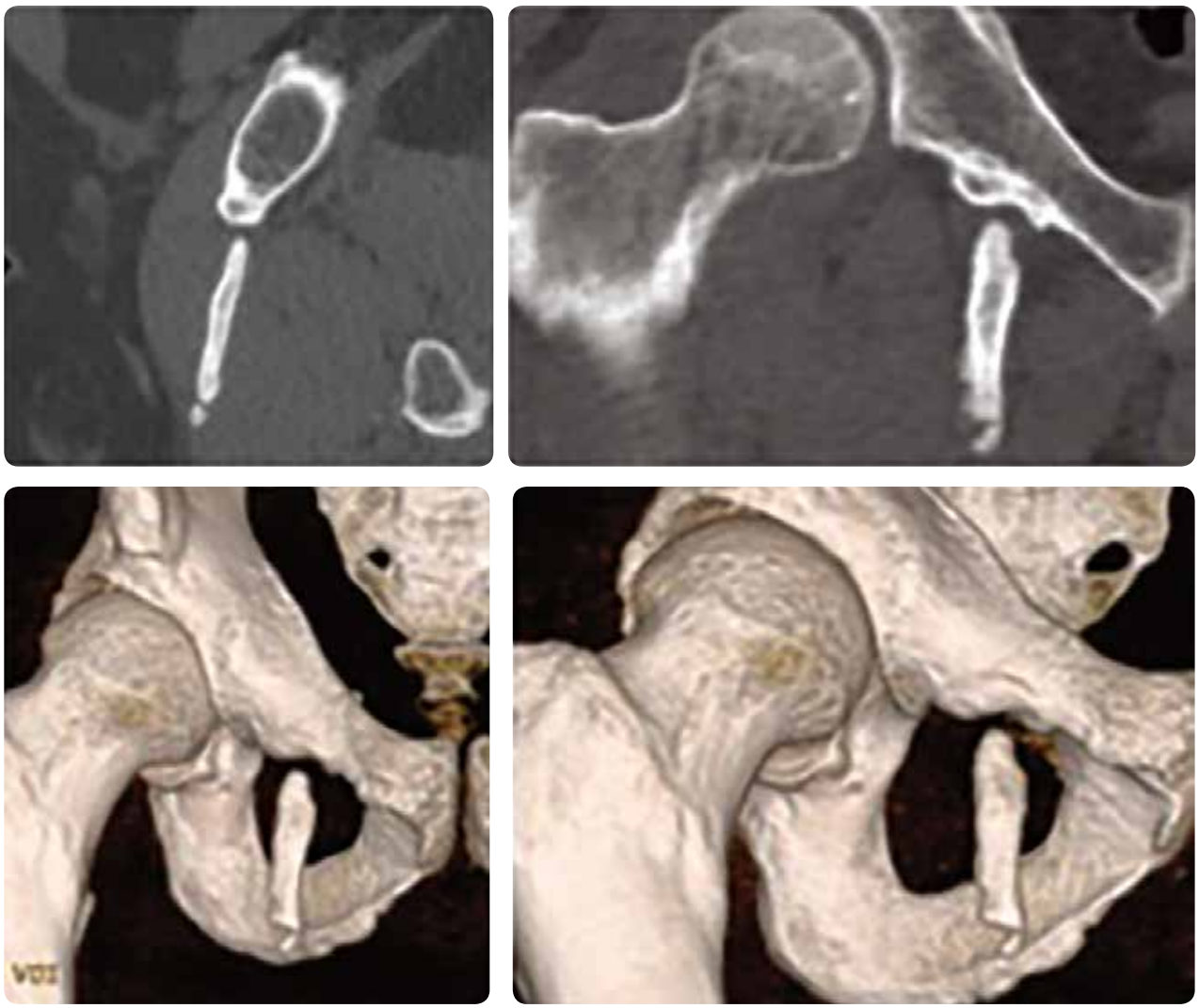

Figure 4. Sagittal and coronal sections of CT (upper) and three-dimensional reconstructions (lower): the presence of an ossified linear structure is confirmed in the soft tissues of the anterior and medial aspect of the right hip, extending from the pubis to the height of the adductor muscles.

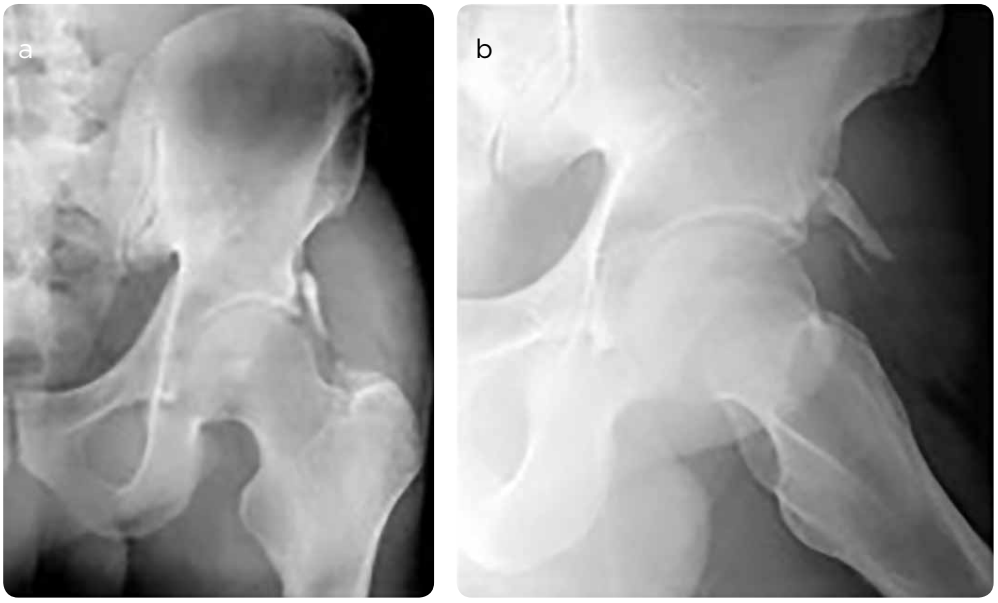

Figure 5. X-ray of the left hip, projections a) anteroposterior and b) lateral. In the soft tissues adjacent to the outer edge of the acetabular roof, two calcified linear images with phalanx-like morphology corresponding to pelvic fingers are identified.

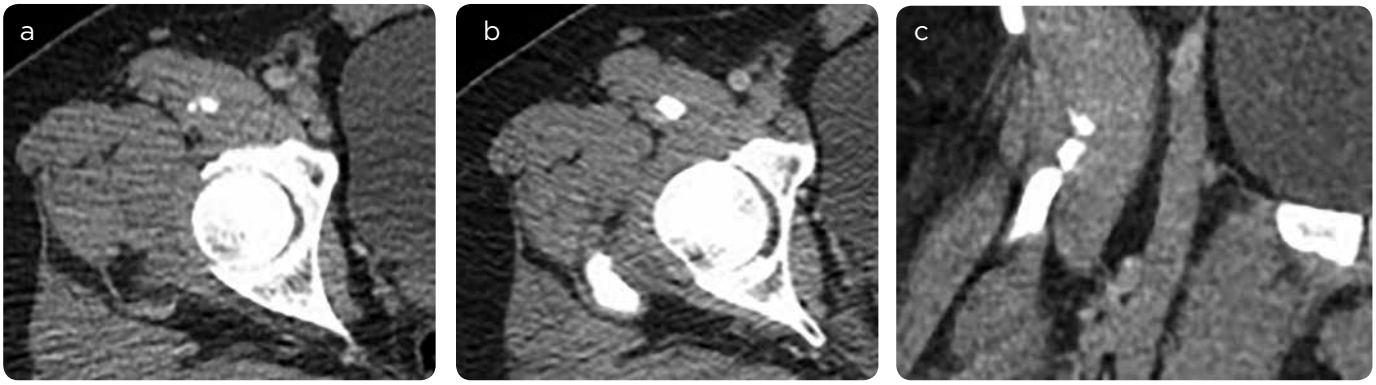

Figure 6. a and b) Axial cuts, c) Coronal cut of CT scan of abdomen at right hip height. In the anterior soft tissues of the right hip, a linear calcified image with phalanx morphology corresponding to pelvic finger is observed.

Figure 7. X-ray of the hip, single anteroposterior projection, carried out later, where the findings of the CT scan (arrow) are confirmed.

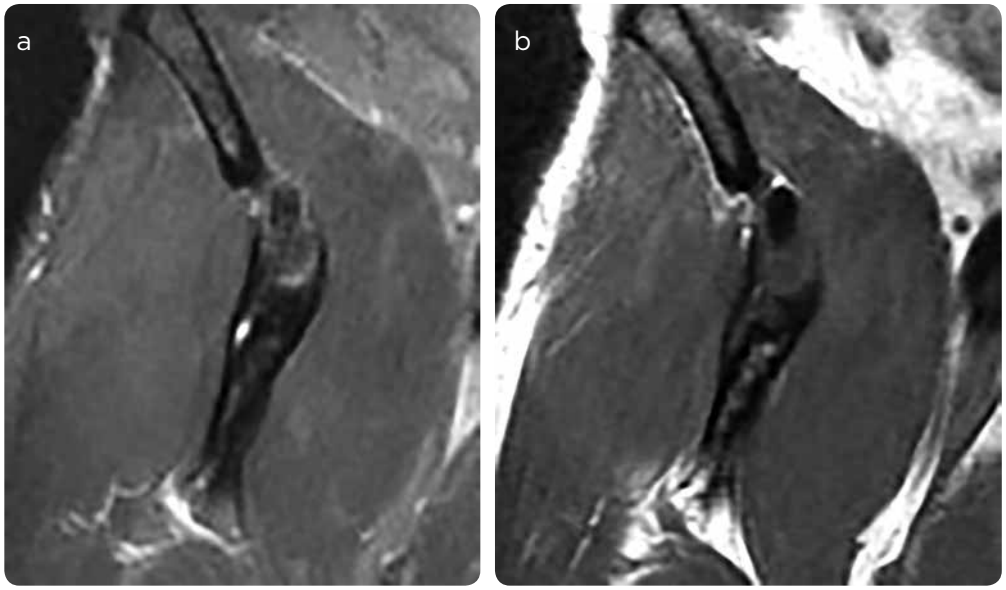

Figure 8. Coronal MRI cuts at right hip height: an ossified, linear image projected on the anterior soft tissues is observed, articulated with the anterior portion of the acetabular roof.

Figure 9. In view of the findings of the MRI, complementary images were performed. a) X-ray of the hip, single anteroposterior projection and b) CT scan, coronal cut at the height of the right hip, with which the diagnosis of prominent pelvic finger (arrow) was confirmed.

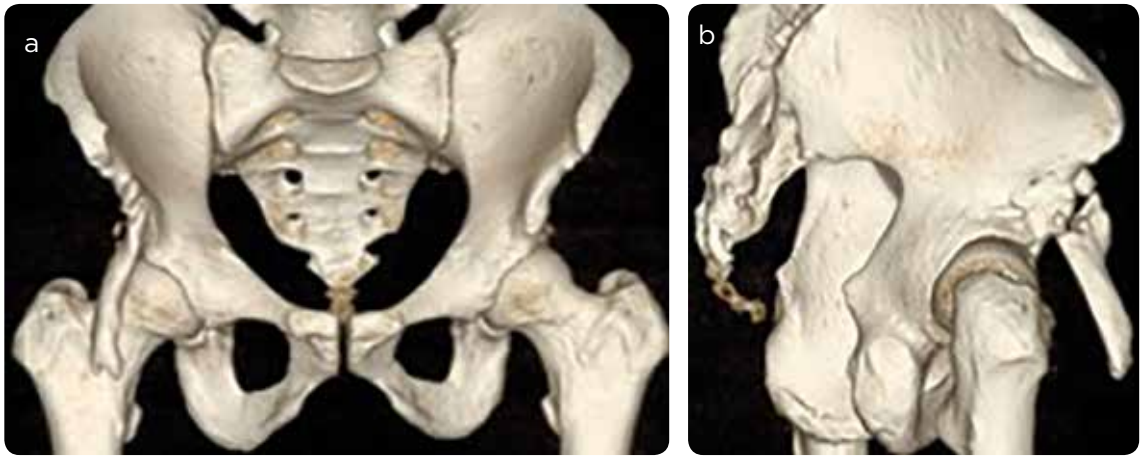

Figure 10. Three-dimensional reconstructions of hip CT: show a pseudoarticulation of the pelvic finger with the right acetabular roof.

Figure 11. Anteroposterior X-ray of the hips: a calcified image with morphology of the phalanx adjacent to the external edge of the right acetabular roof, corresponding to the pelvic finger.

Discussion

The pelvic finger is a benign abnormality of bone development, in which bone forms in the soft tissues adjacent to normal skeletal bone. Although its cause is not clear, it is believed that the alteration occurs during the first 6 weeks of embryonic development, where the primordial costal cartilage of the first coccygeal vertebra does not fuse as it should; a rudimentary rib is then formed in the adjacent soft tissues, in which ossification centers can be fragmented, giving it the appearance of a "phalanx" (1,2). Another theory, studied and less accepted, proposes that it originates from the migration of cells from the mesoderm through the cloacal membrane to the coccygeal region at the end of the third week of development (3,4).

It was first reported in 1974 by Sullivan and Cornwell as a pelvic rib, found in a surgical piece of a 15-year-old patient with pelvic pain. It has since been described as a "rib" or "phalanx" because of its histological composition in which a normal medullary cavity is observed surrounded by well-formed cortex (5,6).

The most frequent location is in the soft tissues adjacent to the iliac bone or the hip joint as found in all patients in this series. However, it can be located around the sacrum, the coccyx, the pubic symphysis, even adjacent to the anterior abdominal wall. Usually, it is single and unilateral, but some cases of bilateral and multiple pelvic finger have been described, as is the case of the third patient presented (1,2,7).

The majority of patients, such as those in the series of cases, are asymptomatic and this is an incidental finding (1,8). However, there are cases that report it as a cause of low back pain or chronic hip pain, probably because of its proximity to the joint or because in some cases it may form pseudojoints with the appendicular skeleton (2,9). In patients with a history of trauma in this location may represent a diagnostic challenge (4).

In images, as described in these patients, it appears as a linear bone structure similar to a rib or phalanx, characterized by a well-defined cortex with a medullary cavity, and often forming one or more pseudojoints with the adjacent bone, cases in which it is more similar to a phalanx (case 1). CT is the modality of choice for confirming the finding, as it allows the cortex and marrow to be clearly identified, as well as determining the relationship of the lesion to adjacent structures (2,10). In symptomatic patients, MRI is useful because it can demonstrate bone marrow edema in the pelvic finger and in pseudoarticulation, as reported in at least two cases in the literature (5,11,12).

Heterotopic calcifications of another cause and bone or soft tissue tumours should be taken into account among differential diagnoses. It is easily differentiated from an osteochondroma by the absence of a cartilaginous cap, and given a well-defined cortex, it can be differentiated from post-traumatic calcifications, ossifying myositis, and avulsion lesions. Another important differential diagnosis is Fong's disease, in which the iliac horns are usually bilateral and originate in the central and posterior aspect of the iliac bones (1,13,14).

The management of these patients is surgical, only if it is confirmed that the lesion is the cause of pain. Otherwise, follow-up imaging may be performed as determined by the treating physician (2).

Conclusions

The pelvic finger is a benign entity, usually asymptomatic and with specific imaging findings. In spite of being an infrequent lesion, it is of great importance that radiologists know it and include it among the differential diagnoses mentioned.

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