Case Resolution

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ABSTRACT

We present the case of an 18-month-old boy with a displaced pelvic fracture and hip epiphysiolysis resulting from non-accidental trauma, after being dragged down a flight of stairs by his caregiver. The radiological protocol used in our institution for suspected non-accidental trauma is described, along with the diagnostic process and the orthopedic and social management implemented.

Keywords: Non-accidental trauma; pelvic fracture; hip epiphysiolysis; children.
Level of Evidence: IV

RESUMEN

Se presenta el caso de un niño de 18 meses con una fractura desplazada de pelvis y epifisiólisis de cadera producidas por un trauma no accidental al ser arrastrado por las escaleras, por su cuidadora. Se define el protocolo radiológico utilizado en nuestra institución para los casos de trauma no accidental, su diagnóstico y los tratamientos ortopédico y social.

Palabras clave: Trauma no accidental; fractura de pelvis; epifisiólisis de cadera; niños.
Nivel de Evidencia: IV

DIAGNOSIS: Multiple pelvic and hip fractures due to non-accidental trauma in an 18-month-old child.

DISCUSSION

Puncture-aspiration was performed under anesthesia to assess the degree of epiphyseal displacement[1] and to evacuate the joint hematoma.[2] Then, using a small amount of contrast medium, an arthrogram was performed, which confirmed the displacement and its instability. Magnetic resonance imaging is another modality to reach the diagnosis when instability is suspected; however, an MRI scanner should be available near or within the operating room to perform it during the same anesthetic procedure (Figures 4 and 5).

Using the Parsch technique[3] via a minimal Hueter approach,[4] the displacement of the femoral head was reduced, and a screw and a pin were placed through a minimal lateral approach under fluoroscopic guidance.

Once the hip had been drained and stabilized, another cannulated screw was inserted percutaneously to stabilize the large fragment avulsed from the iliac wing. The patient was immobilized with a hip spica cast to control the open-book component, and soft-tissue traction was applied; the patient was then placed in postoperative traction. Traction was continued for 3 weeks, and anatomical reduction of the fractures was achieved (Figures 6-8).

Figures 9 and 10 show the imaging follow-up at 6 and 24 months after removal of the osteosynthesis material.

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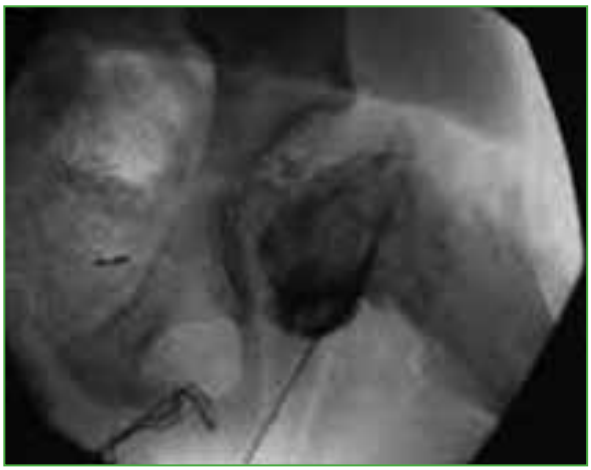

Figure 4. Diagnostic hip arthrogram.

Figure 5. Hip MRI. Grade I epiphyseal displacement is observed.

Figure 6. Positioning and application of a hip spica cast.

Figure 7. Patient in bed traction to achieve reduction of the displaced hemipelvis.

Figure 8. Hip radiograph immediately after reduction.

Figure 9. Anteroposterior pelvic radiograph at 6 months when osteosynthesis material was removed.

Figure 10. Hip radiograph 24 months after surgery.

Although the pelvis of an 18-month-old child contains a large amount of cartilage, which provides increased elasticity and resistance to torsional and shear forces, this same cartilage has high remaining growth potential. Therefore, this type of high-energy trauma can cause permanent damage to the pelvic girdle, the hip joint due to injury mainly to the triradiate cartilage, and in this case, to the proximal femur.[5]

For the reasons described above, stabilization of the femoral epiphysiolysis and of the iliac wing physis was chosen using minimally invasive techniques in order to avoid additional periosteal stripping or damage to the regional blood supply.

When treating a pelvic fracture in children, the instability pattern and the degree of displacement, together with the associated growth-plate injury, must be considered. The belief that anatomical deformities will not cause problems in adulthood is unacceptable.

Vertically displaced unstable type C pelvic fractures can progress to clinically significant pelvic deformity, as well as sacroiliac fusion, scoliosis, and lower-limb length discrepancy.[6]

We must therefore make every effort to ensure that our reduction maneuvers are precise and avoid further stress on the cartilage, especially in the region of the triradiate cartilage or, as in this case, the Risser cartilage.[7] Otherwise, the growth of the pelvic ring will be inhibited, and growth-plate arrest will lead to pelvic asymmetry.

In the treatment of transphyseal fracture of the proximal femur, once instability was confirmed, priority was given to achieving stability by placing a central screw, which was removed at 4 months to prevent physeal arrest *per se*.[8]

Conflicts of interest: The authors declare no conflicts of interest.

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