Case Report | Journal of Orthopaedic Case Reports 2026 November:16(11):Page 309-313

Neglected Traumatic Sacroiliac Joint Disruption in a Young Child: Delayed Open Reduction and Functional Recovery

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Learning Point of the Article:

Delayed open reduction of neglected sacroiliac joint disruption in young children can achieve satisfactory pelvic alignment and functional recovery, even months after injury. Early recognition, careful reduction with growth-plate preservation, and long-term clinical and radiological surveillance are essential to minimize complications and ensure normal pelvic development.

Abstract

Introduction: Traumatic sacroiliac (SI) joint disruption is rare in young children and may lead to significant functional disability when diagnosis and treatment are delayed. Management is challenging due to the immature pelvis and the need to preserve growth potential.

Case Report: An 18-month-old girl, who had been walking independently before the injury, presented 3 months after sustaining trauma following a fall from a tractor. She had initially been managed conservatively at another hospital but continued to experience right lower-back pain and an inability to walk. Clinical examination revealed the right lower limb held in flexion, abduction, and external rotation, with restricted right hip movements and tenderness over the right SI joint. Radiographs and computed tomography demonstrated disruption of the right SI joint with anterior displacement of the right hemipelvis and associated pubic symphysis disruption. In view of the persistent displacement and significant functional impairment, delayed open reduction of the SI joint was performed using a Cobb elevator and a Schanz pin placed in the iliac crest to facilitate reduction. The reduction was stabilized using 3-mm Kirschner wires. Postoperatively, the child was maintained on non-weight-bearing status with bed exercises for 6 weeks, following which mobilization was initiated. The Kirschner wires were removed 3 months after surgery. Independent walking was regained 6 months postoperatively. At the latest follow-up, the child was able to walk independently and sit cross-legged comfortably. Follow-up radiographs demonstrated maintained SI-joint reduction without secondary displacement or loss of reduction.

Conclusion: Carefully performed delayed open reduction can restore pelvic alignment and achieve satisfactory functional recovery in neglected pediatric SI-joint injuries. Long-term clinical and radiological surveillance is essential to monitor pelvic growth and identify potential complications.

Keywords: Sacroiliac joint, pediatric pelvic injury, pelvic ring disruption, joint dislocation, delayed reduction, Kirschner-wire fixation.

Introduction

Pelvic-ring injuries are uncommon in children, and sacroiliac (SI) joint disruption is a particularly rare pattern. The growing pelvis differs from the adult pelvis in its greater elasticity and cartilaginous growth regions; in young children, SI-joint and pubic-symphysis injuries are reported among characteristic pelvic-ring injury patterns. Pediatric pelvic injuries are generally associated with high-energy trauma, and occult injury to the posterior ring may be difficult to appreciate on plain radiographs, making cross-sectional imaging useful when clinical suspicion

Access this article online

Website: www.jocr.co.in

DOI: https://doi.org/10.13107/jocr.2026.v16.i11.8482

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Submitted: 04/08/2026; Review: 14/09/2026; Accepted: October 2026; Published: November 2026

DOI: https://doi.org/10.13107/jocr.2026.v16.i11.8482

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Figure 1: Clinical presentation showing flexion, abduction, and external rotation of the right lower limb.

persists [1].

The acetabulum is involved in 4–20% of these fractures and is often associated with a pelvic ring fracture. It is vital to note that these fractures frequently occur in the setting of high-energy trauma and polytrauma. The vast majority of them are motor vehicle-related accidents: A car-pedestrian collision in 40–80% of instances, or a passenger in a light vehicle in 10–30% of cases [2]. Given the circumstances, practitioners must be aware of the heightened risk of related and perhaps fatal injuries. This is especially true in young children, where the triradiate cartilage is still open and protected by the flexibility of the pubic symphysis and SI joints [3].

In pediatric pelvic injuries, management should aim to restore pelvic stability while preserving the growth potential of the acetabulum and surrounding physes. In children with open growth plates, anatomical reduction of significantly displaced acetabular cartilage is essential to minimize long-term hip dysfunction. Surgical intervention may be considered after a short delay when substantial displacement persists and considerable acetabular growth potential remains. Temporary fixation using Kirschner wires that spare the growth plates for 4–6 weeks may be employed to maintain reduction while minimizing growth disturbance [4]

Long-term follow-up is important because residual pelvic asymmetry, SI-joint changes, back pain, and leg-length discrepancy have been reported after childhood SI-joint disruption. In a retrospective series of 18 children, follow-up averaged 14 years, and radiographic SI-joint changes did not consistently correspond to symptoms [5]. We report a rare case of neglected traumatic SI-joint dislocation with anterior pelvic-ring disruption in a young child, successfully treated by delayed open reduction and Kirschner-wire fixation. The case highlights the importance of appropriate management and continued clinical and radiographic surveillance during growth.

Case Report

An 18-month-old girl, who had been walking independently before the injury, sustained trauma following a fall from a tractor. She was initially managed conservatively at another hospital and presented 3 months after the injury with an inability to walk and pain localized to the right lower back. The right lower limb was held in flexion, abduction, and external rotation (Fig. 1). Clinical examination revealed restricted movements of the right hip and tenderness over the right SI joint.

Radiographs and computed tomography demonstrated separation of the right SI joint, anterior displacement of the right hemipelvis, and disruption of the pubic symphysis (Fig. 2a and b). Open reduction of the right SI joint was performed

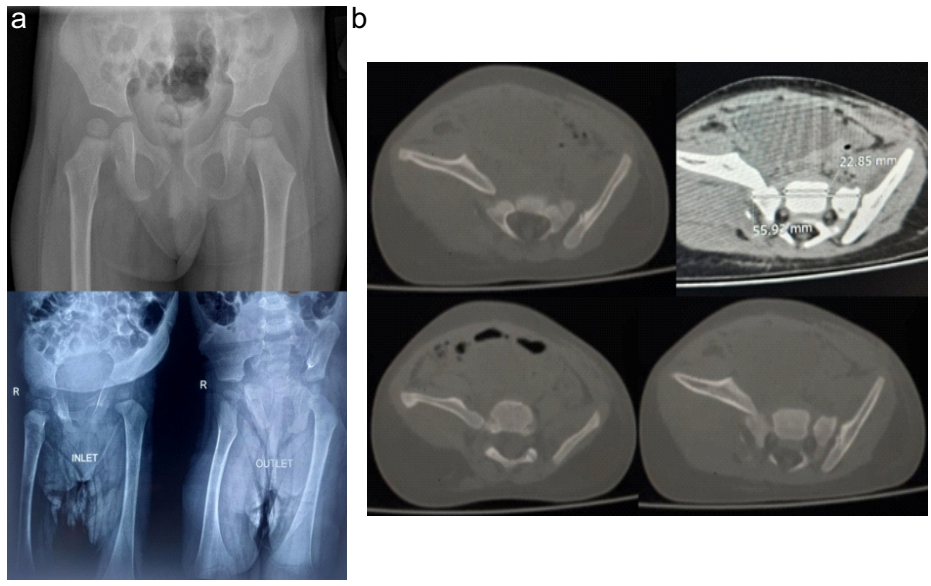


Figure 2: Pre-operative imaging: (a) Pelvic radiograph. (b) Computed tomography scan showing sacroiliac joint and pubic symphysis disruption.

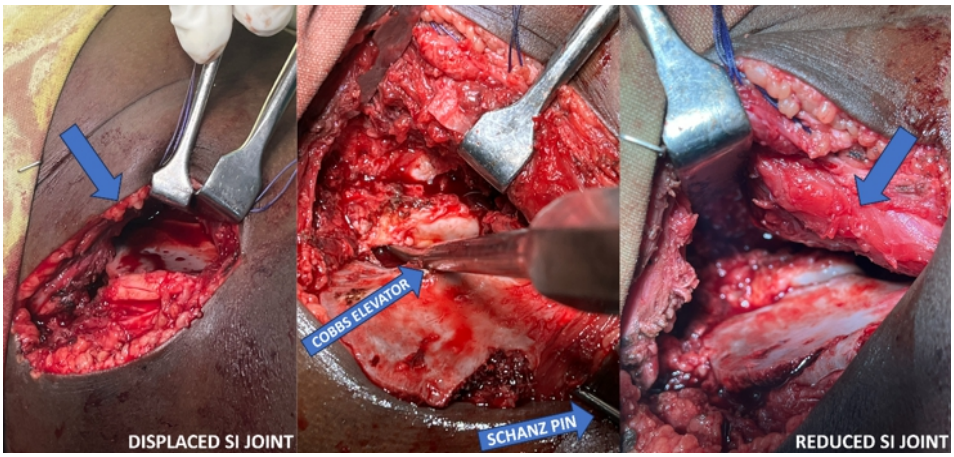


Figure 3: Intraoperative reduction using a Cobb elevator and Schanz pin.

using a Cobb elevator and a Schanz pin placed in the iliac crest to facilitate reduction (Fig. 3). The reduced joint was stabilized using 3-mm Kirschner wires (Fig. 4).

Postoperatively, the child was permitted to perform bed exercises while maintaining non-weight-bearing status for 6 weeks, after which mobilization was initiated. The Kirschner wires were removed 3 months after surgery, and the child regained independent walking at 6 months postoperatively. At the latest follow-up, the 3-year-old child was able to walk independently and sit cross-legged comfortably. Radiographs obtained after 1-year post-surgery demonstrated a well-reduced right SI joint without secondary displacement or loss of reduction. Continued clinical and radiological follow-up was maintained to monitor functional recovery and pelvic development (Figs. 5 and 6).

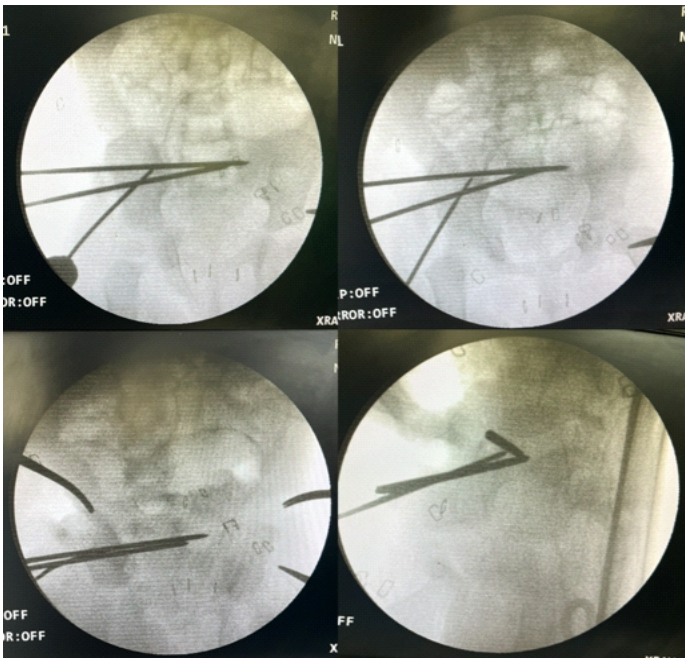


Figure 4: Fluoroscopic confirmation of reduction and Kirschner-wire fixation.

Discussion

Traumatic SI-joint disruption in a young child is rare and may be overlooked because the immature pelvic ring is flexible and the injury may coexist with anterior-ring disruption. The clinical findings in this child – persistent lower-back pain, inability to walk, abnormal limb posture, and focal SI tenderness – were therefore important indicators of a clinically significant posterior-ring injury despite the delayed presentation. Cross-sectional imaging confirmed separation of the right SI joint, anterior displacement of the hemipelvis, and pubic-symphysis disruption. Comparable pediatric reports describe both isolated and combined SI injuries, emphasizing that the injury pattern and the child's clinical status must be assessed together rather than inferred from plain radiographs alone [6].

The decision to operate was guided by persistent displacement, associated anterior-ring disruption, pain, and major functional disability rather than by the time elapsed since injury alone. In a 4-year-old child with complete anterior SI dislocation, Elnahal



Figure 5: Follow-up assessment: Pelvic radiograph showing maintained reduction.



Figure 6: Follow-up assessment: Comfortable cross-legged sitting.

et al. achieved stabilization using K-wires and an external fixator [7], while Abdelgawad et al. reported that ilio-sacral screw fixation can be performed in children when the fixation corridor is carefully planned and imaging guidance is used [8]. Brown et al. likewise described reduction aids and bilateral SI screws for an adolescent with bilateral dislocation. Together, these reports support an individualized strategy based on age, pelvic size, displacement pattern, associated injuries, and the available safe fixation corridors [6]. In the present child, a Cobb elevator and an iliac Schanz pin permitted controlled mobilization of the displaced hemipelvis, and 3-mm Kirschner wires provided temporary stabilization in a very small pelvis while avoiding more extensive implants. The broader pediatric series by Wang et al. also supports tailoring the fixation method to fracture morphology and associated pelvic injuries [9].

The post-operative course was favorable: Protected mobilization began after 6 weeks of non-weight-bearing, independent walking returned by 6 months, and comfortable cross-legged sitting was subsequently achieved. At 1-year follow-up, radiographs demonstrated maintained SI-joint reduction without secondary displacement or loss of alignment. This outcome is consistent with the generally favorable early functional results reported after operative treatment of unstable pediatric pelvic injuries; in a prospective series of 45 surgically treated children, Arafa et al. reported excellent functional results in 93.3% of patients, although complications – including pin-tract infection and limb-length discrepancy – were also observed [10]. The 5-year follow-up reported by Elnahal et al. further illustrates the value of surveillance beyond the early post-operative period [7]. Nevertheless, this remains a single case with limited follow-up relative to skeletal growth. Continued clinical and radiological surveillance through maturity is therefore required to assess pelvic symmetry, SI-joint development, gait, chronic pain, and limb-length equality.

Conclusion

Neglected SI joint disruption in young children can present with significant functional disability and poses a challenging management dilemma. This case demonstrates that carefully planned delayed open reduction and temporary Kirschner-wire fixation can restore pelvic alignment and achieve satisfactory functional recovery, even 3 months after injury. However, long-term clinical and radiological surveillance is essential to monitor pelvic growth and identify potential late complications.

Clinical Message

Persistent pain, inability to walk, and abnormal limb positioning following pediatric pelvic trauma should raise suspicion of an underlying pelvic-ring injury, including SI joint disruption. Delayed presentation should not preclude surgical intervention when significant displacement and functional impairment persist. Careful reduction, preservation of growth-sensitive structures, and long-term follow-up are a key to achieving favorable outcomes.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Conflict of Interest: Nil
Source of Support: Nil

Consent: The authors confirm that informed consent was obtained from the patient for publication of this article

How to Cite this Article

Mahadevuni V, Srinivas PL, Ramesh L, Sale PKA. Neglected Traumatic Sacroiliac Joint Disruption in a Young Child: Delayed Open Reduction and Functional Recovery. J Orthop Case Rep. 2026 November;16(11): 309-313. doi: 10.13107/jocr.2026.v16.i11.8482.