



Bilateral Open Distal Radius Epiphyseal Separation Fracture: A Rare Case and Literature Review at the La Renaissance University Hospital Center

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ARTICLE INFO

Article history:

Received: 14 August 2026;

Received in revised form:

14 September 2026;

Accepted: 30 September 2026;

Keywords

Bilateral Open Epiphyseal Separation Fractures, Radiographic Assessment.

ABSTRACT

Epiphyseal separation fractures of the distal radius represent the most common injury in children, but the open, bilateral form remains rare. We report the case of a 15-year-old right-sided adolescent with no known medical history who was the victim of a road traffic accident resulting in bilateral open wrist trauma. Clinical and paraclinical investigations led to the diagnosis of a bilateral open epiphyseal separation fracture (Gustillo type II on the left and type I on the right; Salter/Harris type II on the left and type I on the right). Careful debridement and reduction were performed, followed by double pinning on the right and quadruple pinning on the left. The anatomical and functional results were excellent.

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Introduction

Distal radius epiphyseal separation fractures are the most common injury in children. Their incidence ranges from 20 to 36% of fractures in children [1]. They most often affect the non-dominant side and occur following an indirect mechanism. The distal radius physis accounts for 80% of length growth; its injury carries the risk of epiphyseal diaphysis and can lead to limb length inequality or axis deviation [2]. Open fractures in children are rare and present a double challenge: infectious and mechanical [3]. The methods for stabilizing the fracture site are multiple, and the choice depends on age, type of fracture, and condition of the adjacent soft tissues [4]. The goal of treatment is to achieve good reduction and maintain it to prevent secondary displacement as well as the risk of infection. We report the case of a bilateral open distal radius epiphyseal separation that had benefited from surgical treatment.

Clinical case: This concerns a 15-year-old right-handed patient with no known medical history, admitted immediately to the emergency department for an open bilateral wrist trauma following a road traffic accident. Indeed, the patient, a motorcyclist in traffic, collided with a car, causing a fall onto the palms of the hands in hyperextension. Clinical examination revealed good general condition, good consciousness; conjunctiva colored without jaundice, and stable hemodynamic status. Examination of the wrists noted a linear wound of approximately 3 cm located on the surface back of the left wrist (figure 1) with exposure of the proximal fragment and an oval wound of about 2 cm located on the lateral edge of the right wrist without vascular or nerve issues downstream.

The radiographic assessment allowed for the diagnosis of a bilateral epiphyseal separation fracture, Salter-Harris type I

on the right and type II on the left (figure 2 ab). After wound care, a preoperative assessment was performed, followed by medical treatment with paracetamol injection 1g every 8 hours, amoxicillin + clavulanic acid 1.2g every 12 hours, and tetanus antiserum vaccination was administered. Two hours after admission, the patient was taken to the operating room under general anesthesia, where meticulous debridement, reduction, and a double pinning on the right and a quadruple pinning on the left (figure 2 cd) were performed. Secondary immobilization was achieved with a bilateral posterior plaster splint.

Postoperative outcomes were straightforward, complete wound healing was achieved at three weeks, and consolidation occurred at 45 days on the right and two months on the left. Pin removal was carried out at two months (Figure 3). Anatomical and functional results are excellent after a two-year follow-up.

Commentary

Epiphyseal separation fractures of the distal radius in children and adolescents are a very common reason for consultation in pediatric emergency departments. These injuries can lead to serious complications and more frequently affect male subjects, as in our case [5]. The open and bilateral nature of epiphyseal separation fractures is very rarely described in the literature. These injuries result from direct trauma caused by sharp objects and account for 2 to 9% of cases, the majority of which occur following accidents involving High-energy, often associated with polytrauma[6]. Management must be early and appropriate because the child is not a miniature adult. In our case, antibiotic prophylaxis was started upon admission and lasted three days, with the aim of preventing infectious risk. According to Patzakakis and

Wilkins, early administration of antibiotics within 3 hours after the trauma reduces the septic risk, with the infection rate decreasing from 7.4% to 4.7%[7]. Although there is a relative consensus regarding the initiation of antibiotic prophylaxis, its duration remains controversial; studies report that it is not necessary to extend it beyond 24 hours[8]. This long duration in our patient could be explained by the exposed bone of the proximal fragment and especially the slight contamination of the wounds at entry. The patient was also operated on within the first three hours. It is indeed true that types I and II respond very well to orthopedic treatment. After a good reduction[9], the bilateral skin opening required us to perform a reduction with multiple pinning. The results of the treatment

of epiphyseal detachment fractures are variously appreciated[2]. In our case, complete wound healing was achieved at three weeks, and consolidation occurred at 45 days on the right and two months on the left. Anatomical and functional results are excellent after a two-year follow-up

Conclusion:

Bilateral open distal radius epiphyseal detachment fractures are very rarely described in the literature. They are serious and can affect the functional prognosis of the upper limbs and/or sometimes the vital prognosis, as they are often secondary to high-velocity trauma. Management remains surgical and must be early and adequate, allowing avoidance of complications such as epiphysiodesis and axis deviation.



Figure 1. Open epiphyseal separation of the left distal radius A) Dorsal view, B) Palmar view.



Figure 2. A) F/P radiograph of the right wrist, B) F radiograph of the left wrist, C) follow-up F/P radiograph of the right wrist, D) follow-up F/P radiograph of the left wrist



Figure 3: A) Control X-ray after pin removal B) Functional results

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