

Scapula Fracture in a Child: Report of a Rare Injury

Florent Tshibwid A. Zeng^{1*}, Mbaye Fall¹, Nankouman Konaté¹, Faty Balla Lô¹, Eben-Ezer Samé¹, Souleymane Camara¹, Aimé Lakh Faye Fall¹, Oumar Ndour¹, Gabriel Ngom²

¹Department of Pediatric Surgery, Aristide Le Dantec University Teaching Hospital, Cheikh Anta Diop University, Dakar, Senegal

²Department of Pediatric Surgery, Albert Royer National Children's Hospital Center, Cheikh Anta Diop University, Dakar, Senegal
Email: *tshibwidflo@gmail.com

How to cite this paper: Zeng, F.T.A., Fall, M., Konaté, N., Lo, F.B., Samé, E.-E., Camara, S., Fall, A.L.F., Ndour, O. and Ngom, G. (2023) Scapula Fracture in a Child: Report of a Rare Injury. *Open Journal of Pediatrics*, 13, 158-163.

<https://doi.org/10.4236/ojped.2023.132020>

Received: January 8, 2023

Accepted: February 21, 2023

Published: February 24, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Scapular fracture is exceptional in children, mainly occurring after high-energy trauma. Radiologic investigations help its diagnosis and classification, which determines its management. We report the case of a 14-year-old patient admitted for blunt trauma of the left shoulder after falling from a speeding car. The diagnosis of a displaced fracture of the body of the scapula was made, and non-operative treatment was indicated and carried out for four weeks, followed by physiotherapy for another four weeks. Nine weeks after the trauma, the mobility of the affected shoulder was equivalent to that of the contralateral shoulder.

Keywords

Fracture, Scapula, Child, Non-Operative Management, Case Report

1. Introduction

Scapula fracture is rare in pediatric orthopedic practice, accounting for less than one percent of fractures in this population category [1] [2]. From 1839 to 2020, only 70 cases were reported in the Anglophone literature [3]. In 19 of them, the fracture affected the scapular body, occurring in patients with mean age of 10.5 years [3]. This lesion most often occurs following high-energy trauma, and patients are usually polytraumatized [1]. Some rare cases of fatigue fractures were however reported, along with a particular group of neonates with acromial fractures due to spastic contractions secondary to epilepsy or tetanus [3]. After clinical suspicion, radiographic investigations confirm the diagnosis, classify the fracture and indicate the appropriate treatment [3]. The latter is essentially non-operative, with good functional and cosmetic outcomes [1]. We report the case

of a patient managed in our pediatric surgical department.

2. Case Presentation

A 14-year-old patient was admitted to the pediatric surgical department of Aristide Le Dantec University Teaching Hospital in Dakar (Senegal) for blunt trauma of the left shoulder 16 hours after a road traffic accident (RTA). Clinging to the back of a speeding car, the patient allegedly fell from a height of 50 cm, landing on his left shoulder, resulting in pain and swelling, which led to the consultation in our service. The patient was right-handed, not schooled, and with no particular medical history.

He was in good general condition at the initial examination, and his vitals were within normal ranges (Temperature = 37.2°C, Heart rate = 85 bpm, Respiratory rate = 17 cpm, and Pulse oximetry = 97%). On inspection, we noted a Dessault posture at the left upper limb, a sagging ipsilateral shoulder, a swelling over the ipsilateral scapula, and a bruising around the scapular region (**Figure 1**). The palpation over the swelling revealed exquisite pain, while palpation along the ipsilateral clavicle and proximal humerus was unremarkable. The mobility of the ipsilateral shoulder was pain-limited (rated nine out of ten), and its sensitivity was normal. The pleuropulmonary examination and the rest of the physical examination, looking for other traumatic injuries, were unremarkable.

Assuming diagnostic hypothesis of fracture of one or more bones of the left shoulder, an X-ray of the shoulder was performed, showing a lesion of the scapula, without much precision of the fracture line and the displacement (**Figure 2**). Secondly, a computed tomography (CT) scan of the affected shoulder skeleton with three-dimensional (3D) reconstruction revealed a fracture of the body of the scapula with extra-thoracic displacement (**Figure 3**), without articular involvement, associated with a fracture of the lateral border of the scapula (**Figure 4**).

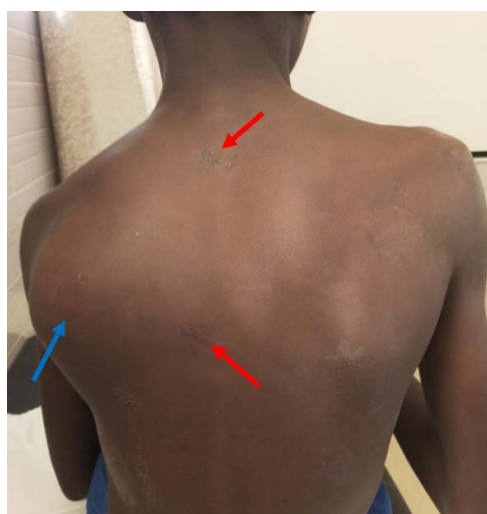


Figure 1. Clinical aspect of the back. Note the swelling of the left scapular region (blue arrow), and bruising around this region (red arrows).

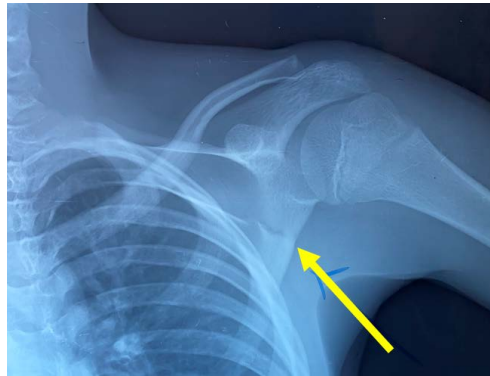


Figure 2. Lateral X-ray of the left shoulder. Note the fracture line on the body of the scapula (yellow arrow). Displacements could not be better appreciated based on this radiography.

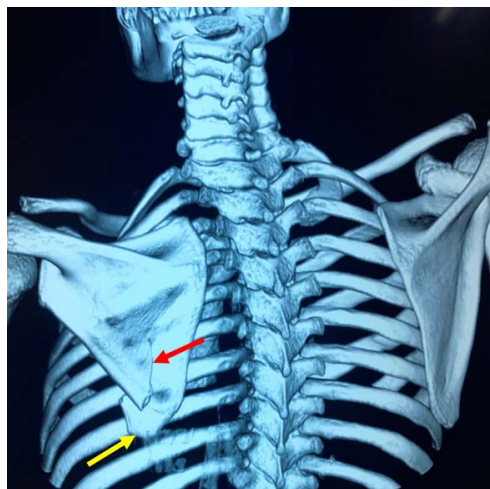


Figure 3. 3D reconstruction of the posterior chest wall by CT. Note the presence of a vertical fracture line affecting the infraspinatus part of the body of the scapula (red arrow). There is an extra-thoracic anterior displacement of the lower angle of the scapula (yellow arrow).

The non-operative treatment initiated from the first consultation was continued: a Mayo Clinic-type sling for four weeks, paracetamol (15 mg/kg four times a day) for two weeks, and ibuprofen (10 mg/kg three times a day) for one week. In the fourth week, the patient was seen again at the outpatient department, with significant regression of swelling and pain, then rated at zero out of ten. Physiotherapy based on pendulum-type exercises, with 2.5 kg weight, was started at home for another four weeks, and the patient was seen again five weeks later, with complete regression of the swelling, slight deformation of the relief of the ipsilateral scapula (**Figure 5**), an absence of pain, and mobility equivalent to the contralateral shoulder. At four months post-trauma, examination of the left shoulder is unremarkable.

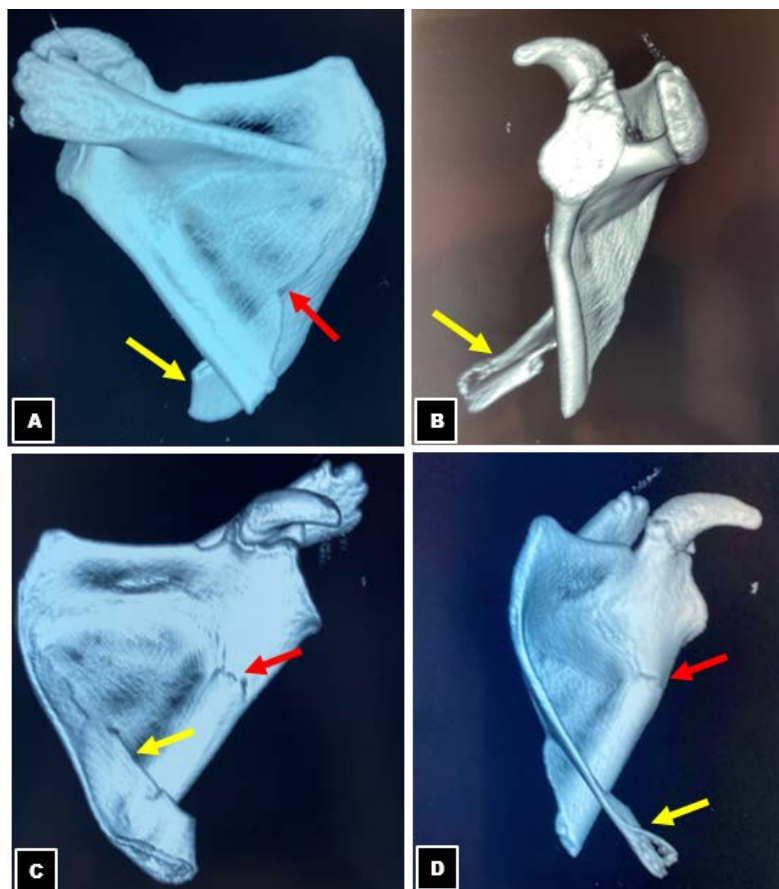


Figure 4. 3D reconstruction of the scapula. In the posterior view (A), the vertical fracture line is seen (red arrow), with anterior displacement of the lower angle (yellow arrow), best visualized in the lateral view (B). On the anterior view (C), the vertical line is identified (yellow arrow), and a second transverse fracture line appears on the lateral border of the scapula (red arrow); this fracture line is also identified on the medial view (D), the displacement anterior of the medial fragment is evident (yellow arrow).

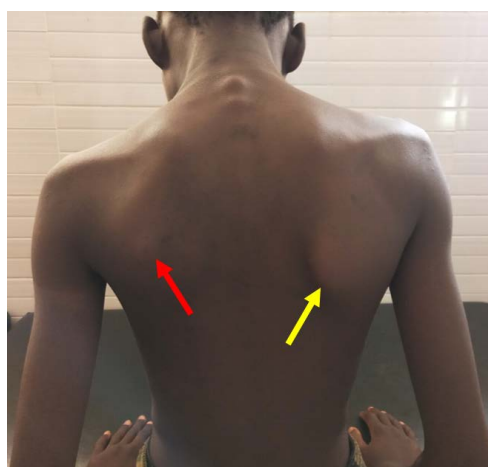


Figure 5. Cosmetic result at week 9 post-trauma. Note the slight deformation of the left scapula (red arrow), with loss of relief of the scapular angle compared to the opposite side (yellow arrow).

3. Discussion

In common pediatric orthopedics practice, scapula fractures are exceptional [1] [2] [3], such that only 70 cases have been reported in the Anglophone literature until 2020 [3]. This rarity would be explained by the large muscle mass around the scapula, with 17 muscle insertions constituting a considerable cushion absorbing various traumas' energy [1]. These fractures occur during high-energy trauma, including falls from heights and RTAs [4], as was the case in our patient. In such situations, the muscle cushion is insufficient to absorb all the energy of the trauma, which is transmitted to the scapula and most often results in a fracture of its body [1]. Some rare cases of fatigue fractures were however reported, along with a particular group of neonates with acromial fractures due to spastic contractions secondary to epilepsy or tetanus [3]. Other circumstances, such as abuse or electrocution, were reported [2] [5]. These fractures are classified according to the part of the scapula that is affected: body, glenoid cavity, neck, acromion, and coracoid process [1].

The diagnosis is suspected based on a history of high-energy trauma by a direct mechanism, and in these cases, the patient can attend the hospital in the context of polytrauma. In non-displaced fractures, the muscular cushion around the scapula makes clinical suspicion difficult, often guided by signs of trauma such as bruising or dermabrasion in the ipsilateral scapular region [2]. In displaced fractures, swelling is evident and guides the clinician [2], as in our case. The rest of the physical examination will focus on searching for associated trauma-related lesions [6]. The plain X-ray is the first-line investigation and makes it possible to visualize the scapular lesion. However, a CT scan with 3D reconstruction allows detailed visualization of the lesions, allowing classification of the fracture [3]. Our patient presented with a fracture of the body of the scapula, the second most frequent after that of the acromion [3]. In the literature, all fractures of the body of the scapula affect its infraspinous part [3]. This was the case with our patient. Intrathoracic displacements of fracture fragments are not rare. In the case of high-energy trauma, it is not uncommon for associated lesions to be present and should always be sought; some are even life-threatening [1]. These associated lesions (pneumothorax, hemothorax, vascular injuries, and visceral injuries of varying severity) are either secondary to fracture displacement or directly related to the trauma at the origin of the fracture, depending on its intensity [1]. In our patient, the displacement of the medial fragment of the fracture was extra-thoracic, and no associated lesion was identified.

The treatment of scapula fracture is based on the presence or absence of articular involvement [6] and the association of intrathoracic displacement [3]. Extra-articular fractures, as in the case of our patient, require non-operative treatment with immobilization of the affected shoulder with a Mayo Clinic or Dujarier-type sling for three to six weeks [1] [2] [6]. In our patient, this treatment lasted four weeks; the absence of pain and the regression of the swelling motivated its discontinuation. Physiotherapy sessions are recommended in the fol-

lowing weeks, with pendulum-type exercises [2], that were undertaken in our patient for four weeks. As in our patient, the results of orthopedic treatment vary from good to excellent, and complications are exceptional [3].

4. Conclusion

The scapula fracture is very rare in children. It occurs after a high-energy trauma. Computed tomography is necessary for the classification of the fracture on which the treatment is dependent. The latter is majorly non-operative in children and gives good results.

Acknowledgements

The author FTAZ thanks the NGO Förderverein Uni Kinshasa (fUNIKIN), which funds his pediatric surgery specialization through the BEBUC excellence scholarship.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

Consent for Publication

A written consent for publication was obtained from the patient's parents.

References

- [1] Azbug, J.M. and Waters, P.M. (2015) Clavicle and Scapula Fractures: Acromioclavicular and Steroclavicular Injuries. In: Flynn, J.M., Skaggs, D.L. and Waters, P.M., Eds., *Rockwood and Wilkins' Fractures in Children*, 8th Edition, Wolters Kluwer Health, Philadelphia, 822-827.
- [2] Mooney-III, J.F. and Murphy, R.F. (2020) Fractures and Dislocations about the Shoulder. In: Mencio, G.A. and Frick, S.L., Eds., *Grren's Skeletal Trauma in Children*, 6th Edition, Elsevier, Philadelphia, 447-449.
- [3] Bartoníček, J. and Naňka, O. (2022) History of Diagnostics and Treatment of Scapular Fractures in Children and Adolescents and Its Clinical Importance. *Archives of Orthopaedic and Trauma Surgery*, **142**, 1067-1074.
<https://doi.org/10.1007/s00402-021-03800-8>
- [4] Shannon, S.F., Hernandez, N.M., Sems, S.A., Larson, A.N. and Milbrandt, T.A. (2019) High-Energy Pediatric Scapula Fractures and Their Associated Injuries. *Journal of Pediatric Orthopaedics*, **39**, 377-381.
<https://doi.org/10.1097/BPO.0000000000000969>
- [5] Bullock, D.P., Koval, K.J., Moen, K.Y., Carney, B.T. and Spratt, K.F. (2009) Hospitalized Cases of Child Abuse in America: Who, What, When, and Where. *Journal of Pediatric Orthopaedics*, **29**, 231-237.
<https://doi.org/10.1097/BPO.0b013e31819aad44>
- [6] Benradi, L., Nour, M. and Belahcen, M. (2020) Fracture de l'omoplate : Une observation rare en orthopédie pédiatrique. *Annals of African Medicine*, **13**, e3918-e3922.