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Diaphyseal fractures specific to children

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Abstract
Introduction: Fractures specific to children deserve to be individualized from other fractures because of the particular pathological pictures, therapeutic orientations and evolutionary aspects usually borrowed from a good prognosis.
Objective: The aim was to report on the epidemiological, diagnostic, therapeutic and evolutionary aspects of diaphyseal fractures specific to children.
Patients and Method: This is a retrospective study over a period of 4 years at the pediatric surgery department of the Aristide Le Dantec University Hospital in Dakar.
Results: The frequency was 13.14% of all fractures diagnosed during the same period. The most affected age group was 6 to 15 years. Domestic accidents were the most frequent cause, followed by recreational accidents. The two bones of the forearm were the most affected. Most of the fractures involved the distal third with 101 fractures. Green wood fractures predominated (47%), followed by butter clod fractures (43%). Plastic and subperiosteal fractures accounted for 9% and 6% of fractures, respectively. All our patients benefited from an orthopedic treatment that consisted of 150 circular casts, 20 plastered splints and 10 fixed bandages, strapping or Blount. Sequelae-free consolidation was the rule in all patients.
Conclusion: The child's own fractures most often occur at school age. They are dominated by playful accidents and involve the distal third of long bones. Orthopedic treatment gives very good results.

Keywords: Fracture, child, orthopedic treatment, good results

Introduction
Diaphyseal fractures specific to children (greenwood, lump of butter, hair and plastic) are defined as incomplete fractures occurring only in children [1]. These fractures deserve to be individualized from other fractures because of the particular pathological pictures, therapeutic orientations and evolutionary aspects usually with a good prognosis [2]. Studies focusing exclusively on child-specific fractures are rare in the literature. This motivated us to carry out this work with the aim of studying the epidemiological, diagnostic, therapeutic and evolutionary aspects in the emergency unit of the pediatric surgery department of the Aristide Le Dantec University Hospital Center in Dakar.

Patients and Method
This was a retrospective descriptive and analytical study of all patients under 16 years of age, who presented with a diaphyseal fracture specific to the child at the pediatric surgery department of the Aristide Le Dantec Hospital in Dakar during the period from January 1, 2018 to December 31, 2021.
The diaphyseal fractures specific to the child are: greenwood fractures, butterball fractures, plastic fractures and subperiosteal fractures.
We took into account: the frequency of the different fractures seen in the emergency department, the age (newborns, infants and children), the sex of the patients, the time of consultation, the circumstances of the accident, the bone affected and the topography of the fracture (diaphyseal, metaphyseal), the type of fracture itself, the treatment and the evolution.

Results
Out of 1369 cases of children with fractures during the study period, we counted 180 cases of children with a fracture of the child's own, i.e. 13.14% of all fractures.
The most affected age group was 6 to 15 years old with 86 cases, i.e.

48% of the population studied. The average age was 6.22 years. Figure 1 show the distribution by age group.

There were 107 boys and 73 girls, a sex ratio of 1.46.

The average time to consultation was 48.24 hours with extremes of one hour and 11 days. Table 1 illustrates the different types of accidents.

For recreational and domestic accidents, fractures caused by falls predominated, followed by traffic accidents involving a motor vehicle.

The two bones of the forearm (radius and ulna) were the most affected with 115 and 55 fractures respectively, i.e. 47% and 23% of cases.

In 46 patients, both bones were fractured concomitantly. Table 2 shows the number of fractures as a function of the bone affected.

The majority of fractures were in the distal third with 101 fractures or 71%. The others were located in the middle third with 30 fractures or 21% and the proximal third with 11 cases or 8%. Table 3 illustrates the topography of fractures on the affected bone.

Greenwood fractures were predominant with 47%, followed by butter lump fractures, plastic fractures and subperiosteal fractures which accounted for 43%, 9% and 6% of cases, respectively. Note that only one greenwood fracture had a slight 10° angulation.

All of our patients have been immobilized. One hundred and fifty-one (150) circular casts, 20 plaster splints and 11 bandage immobilizations (Mayo Clinic 5 cases, Strapping 5 cases, Blount 1 case) were performed, as there was a child who had a fracture of the distal end of the radius associated with a supracondylar fracture type III of Rigault and Lagrange.

Sixty-seven children received analgesic treatment with paracetamol alone at a rate of 60mg/kg/day divided into 4 daily doses. In 113 children, paracetamol was combined with a non-steroidal anti-inflammatory drug. Ibuprofen was prescribed in 55 children. Niflunian acid was prescribed in 58 children.

Consolidation without sequelae was the rule in all patients.

Table 1: Different circumstances of trauma occurrence

Circumstances of Occurrence of the Trauma	Absolute Frequency	Relative Frequency
Domestic Accident (AD)	92	51%
Playful Accident (AL)	60	33%
Traffic accident (AT)	24	13%
Sports Accident (AS)	3	2%
Obstetric Accident (OA)	1	1%
Total	180	100%

Table 2: Distribution of the number of fractures according to the bone affected

Bone affected	Number	Percentage
Collarbone	5	2%
Humerus	5	2%
Radius	115	47%
Ulna	55	23%
Metacarpal and Phalanges	3	1%
Thighbone	5	2%
Shin	33	14%
Fibula	19	8%
Metatarsal and Phalanges	3	1%
Total	243	100%

Table 3: Topography of Fractures

Localization	Absolute Frequency	Relative Frequency
Proximal third party	11	8%
Middle-tier	30	21%
Distal third	101	71%
Total	142	100%

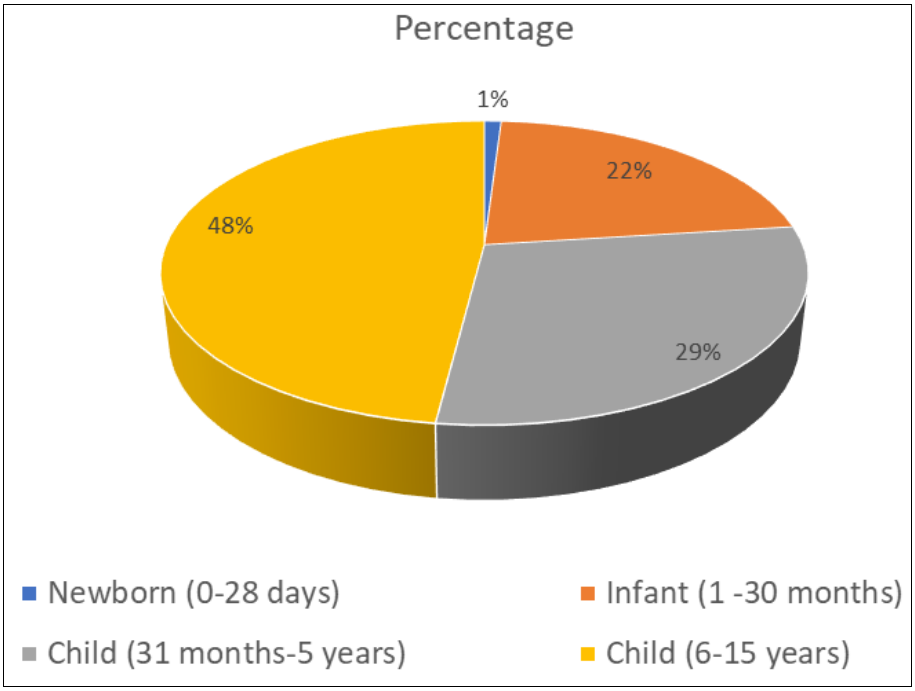

Fig 1: Distribution of own fractures by age group

Fig 2: Butter lump fracture

Fig 3: Green Wood Fracture

Fig 4: Plastic Fracture

Fig 5: Hair Fracture

Discussion

The share of children's own fractures in relation to all fractures in children is small in our study. Indeed, in our study, these own fractures represent a little more than 10th of childhood fractures. It can therefore be said that children have many more diaphyseal fractures identical to those of adults.

In our study, the 6-15 age group is the most affected by children's own fractures. These specific fractures affect boys more often than girls, as in our study [3, 4]. The predominant mechanism is falling, regardless of the environment in which one finds oneself. In the West, falls are most often caused by vigorous sports such as snowboarding, skiing, snowboarding [5]. In our study, children are more at risk at home during games represented by football and wrestling, resulting in falls from their heights.

In our study, we found a predominance of child-specific fractures in both bones of the forearm. Fractures mainly affect the radius and most often its distal part [2, 6]. The results of the literature are therefore confirmed in our work, namely the predominance on the thoracic limb and on the distal quarter of the radius. The high proportion of fractures of the forearm is thought to be related to the fact that the upper limb is most often used as a countermeasure during falls, which are the dominant mechanism [7].

If we now study in our series the types of fractures specific to the child, we encounter all the possible modalities. However, we note a clear predominance of green wood and butterball fractures, which account for 90% of all child-specific fractures. These two types of fracture largely predominate in the literature, with varying order depending on the author [2, 6, 8, 9]. In our study, the greenwood fracture predominates at the level of the radial shaft while the butterball fracture also predominates on the same bone but on its distal metaphysis.

In practice, subperiosteal, lump of butter and plastic fractures benefit from orthopaedic treatment with a favourable course [1]. In our series, the treatment is exclusively orthopaedic.

Only one fracture with low displacement was noted and orthopedic treatment as for the other non-displaced fractures. On the other hand, greenwood fractures require monitoring because they can move within two weeks of the fracture occurring. One series reported displacement in the range of 20-25% [10].

As for the choice of immobilization technique, it depends essentially on the site of the fracture and its displacement [1]. In our study, circular or gutter casts are most often used because of the predominant location of fractures in the forearm. The treatment of fractures must be combined with drug treatment of pain and edema, which justifies the systematic administration of analgesics in our series. Anti-inflammatories were administered on a case-by-case basis as needed. This drug treatment is essential for the patient's comfort.

In addition, we note that the prognosis is excellent in the child's own fractures, since no complications or sequelae have been reported in the follow-up of the patients.

Conclusion

Fractures own to children most often occur in school age. They are dominated by domestic accidents and playful by a fall. They involve the distal third of the long bones. In the majority of cases, they are located in the two bones of the forearm. The most common types of fractures are green wood and butter lump fractures. Orthopaedic treatment gives very good results.

Conflict of Interest

Not available

Financial Support

Not available

Références

1. Ömeroğlu H. Basic principles of fracture treatment in children. Joint Diseases and Related Surgery. 2018;29(1):52-57.
2. Randsborg PH, Gulbrandsen P, Saltytė Benth J, Sivertsen EA, Hammer OL, Fuglesang HF, et al. Fractures in children: epidemiology and activity-specific fracture rates. J Bone Joint Surg Am. 2013;95(7):42.
3. Cheng JC, Shen WY. Limb fracture pattern in different pediatric age groups: A study of 3,350 children. J Orthop Trauma. 1993;7(1):15-22.
4. Cooper C, Dennison EM, Leufkens HG, Bishop N, Van Staa TP. Epidemiology of childhood fractures in Britain: a study using the general practice research database. J Bone Miner Res. 2004;19(12):1976-1981.
5. Oberlin V. Orthopedic treatment of metacarpal and phalangeal fractures. Development and Health, 1984, (53).
6. Otayek S, Ramanoudjame M, Fitoussi F. Fractures of the distal end of the radius in children. Hand Surg Rehabil. 2016;35:150-155.
7. Evans EM. Fractures of the radius and ulna. J Bone Joint Surg Br. 1951;33-(4):548-561.
8. Abdeslam B, Nouri S, Rezzik S, Benbouzid A. Short-term orthopaedic treatment of isolated fractures of the ulnar shaft. Hand Surg Rehabil. 2017;36(6):461-462.
9. Tra Bi Zamble et al. Traumatic fractures of the forearm in children: epidemiological and radiological profile. Health Sci. Dis: 2022;23(12):20-22. Available from: www.hsd-fmsb.org
10. Swischuk LE, Hernandez JA. Frequently missed fractures in children (value of comparative views). Emerg Radiol. 2004;11(1):22-28.

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