

Osteoarthritis of the hip in children at the Lomé Teaching Hospital

Komla Gnassingbe^a, Yaovi James^b, Komlan A. Mihluedo-Agbolan^a, Kokou Kanassoua^c, Gamedzi K. Akakpo-Numado^a, Yaya Kpapile^a and Hubert A. Tekou^a

Objectives The aim of this study was to describe the epidemiological and therapeutic aspects of osteoarthritis of the hip in children, analyze the outcome, and describe the techniques for its diagnosis in a hospital with poor working conditions.

Materials and methods This was a retrospective study including children in the age group of 0–15 years, who were managed for osteoarthritis at the Pediatric Surgery Department of the Lomé Teaching Hospital (Togo) between July 2000 and June 2008. The data were collated from patients' records and analyzed for epidemiology, clinical features, treatment, and outcome of osteoarthritis.

Results A total of 30 children were included in this study, of whom 17 (24.4%) were girls and 13 (43.3%) were boys. Their mean age was 4 years (range: 1–15 years). Children in the age range of 0–6 years accounted for 73.33% of patients included. Fifteen patients were of the homozygous sickle cell genotype (SS). Treatment included antibiotic therapy and immobilization of the joint. The outcome was excellent in eight AA patients (26.67%); good in three

(10%), including one SS, one AS, and one SC; and fair in 19 patients (63.33%), including 14 SS, four AS, and one SC. The average duration of hospital stay was 18 days (range: 2–35 days).

Conclusion Sickle cell disease (SS genotype) is the predominant cause of osteoarthritis in children presenting to the Pediatric Surgery Department of the Lomé Teaching Hospital. Early diagnosis and appropriate treatment are necessary for a complete cure. *Ann Pediatr Surg* 9:31–33 © 2013 Annals of Pediatric Surgery.

Annals of Pediatric Surgery 2013, 9:31–33

Keywords: child, hip, osteoarthritis, sickle cell, Togo

Departments of ^aPediatric Surgery, ^bOrthopedic Surgery and Traumatology and ^cSurgical Emergency, Lomé Teaching Hospital, Lomé, Togo

Correspondence to Komla Gnassingbe, PhD, Department Pediatric Surgery, Lomé Teaching Hospital, P.O. Box 57, Lomé, Togo
Tel: + 228 90 09 65 74/ + 228 98 28 35 38/ + 228 23 36 65 40;
fax: + 228 22 21 25 01; e-mail: jeanpi_gnass2002@yahoo.fr

Received 11 September 2011 accepted 14 October 2012

Introduction

Septic osteoarthritis of the hip is a severe pathological condition and is the most common cause of joint infections in children [1,2]. Osteoarthritis has disabling sequelae and affects individuals of all age groups, with extreme severity during the neonatal stage [3,4]. In developing countries such as Togo, delay in diagnosis, in addition to irrational antibiotic therapy, is a major contributing factor that defines the clinical presentation of this condition. The aim of this study was to describe the epidemiological and therapeutic aspects of hip osteoarthritis in children in Lomé, analyze its outcome, and describe the technique for its diagnosis in a hospital with poor working conditions.

Patients and methods

This was a retrospective study including children in the age group of 0–15 years, who were managed for osteoarthritis of the hip at the Pediatric Surgery Department of the Lomé Teaching Hospital (Togo) between July 2000 and June 2008 (a period of 8 years). The data were collated from patients' records and analyzed for epidemiology, clinical features, treatment, and outcome of osteoarthritis.

During the study period, the Lomé Teaching Hospital was underequipped for medical imaging techniques, including ultrasound, computed tomography (CT), scintigraphy, and MRI. Therefore, for the diagnosis of septic arthritis of the hip, we used the criteria advocated by Waldvogel, as cited by Journeau *et al.* [5].

- (1) Existence of joint pain in a febrile environment.
- (2) Positive bacteriological analysis on blood culture or the local leviés.
- (3) Radiological signs such as swelling of the soft parts, joint effusion, or bone destruction.
- (4) Drainage of purulent fluid during surgery.

However, since the summer of 2008, our hospital has been equipped with powerful medical imaging equipment, although scintigraphy and MRI are not available yet. MRI is available in a private clinic but is not accessible to the public because of its high cost (nearly 1000 US dollars). The hospital now has an ultrasound machine and a radiologist who is capable of performing ultrasound scans and reviewing the results at any time.

The outcomes of the treatment for osteoarthritis were determined on the basis of the clinical and radiographic signs after treatment.

- (1) The results were considered good under the following conditions:
 - (i) Absence of pain during walking and mobilization of the hip.
 - (ii) Absence of radiographic signs.
- (2) The results were considered poor under the following conditions:
 - (i) There was residual pain during resting and on mobilization of the hip, with limitation in movements.

- (ii) Presence of radiographic signs (including partial or total destruction of the femoral head).

This study was approved by the ethical committee board.

Results

A total of 30 children with osteoarthritis of the hip were included in the study, of whom 17 (56.7%) were boys and 13 (43.3%) were girls. Their mean age was 4 years (range: 1–15 years). Twenty-two (73.33%) patients were aged between 0 and 6 years, five (16.67%) between 6 and 11 years, and three (10%) between 11 and 15 years. Osteoarthritis represented 24.4% of all surgical causes for hospital admission among children. All (100%) patients had febrile hip pain at admission. The findings on physical examination at admission are summarized in Table 1.

A patient could present one or more physical signs.

The hemoglobin profile of the patients showed SS genotype in 15 (50%) patients, AA in eight (26.67%), AS in five (16.67%), and SC in two (6.66%). Plain radiographs of the affected hip joint were used for radiological investigation in this study (Table 2).

A patient could have more than one radiographic sign.

No patient underwent ultrasound scanning, MRI, CT, or scintigraphy because these techniques were unavailable to them. Joint aspirations performed on 21 patients (70%) revealed pus in 15 of them. Bacteriological examination of the aspirate showed *Salmonella* spp. in 11 patients (73.33%) and *Staphylococci* spp. in four (26.67%).

All patients were administered empirical parenteral antibiotics for 10 days. The regimen used was a combination of netilmicin and ceftriaxone in 21 patients (70%) and netilmicin and oxacillin in nine (30%). The regimen was then adapted according to the sensitivity result in five of the patients from whom the organisms were isolated. An additional regimen of oral antibiotics comprising ciprofloxacin was administered to all patients for 35 days. In addition to antibiotic treatment, traction was applied for a period of 21 days in 22 patients (73.33%) and a BOPP traction splint was applied in eight.

Table 1 Distribution of patients following the main physical signs

	N (%)
Pain during the mobilization of the hip	30 (100.00%)
Limping	26 (86.67%)
Limitation of the hip movement	24 (80.00%)
Periarticular muscle contraction	10 (33.33%)
Pseudoparalytic aspect of the hip	26 (86.67%)

Table 2 Distribution of patients with various radiological signs

	N (%)
Space pinch of joint space	17 (56.67%)
Pinch of joint space	10 (33.33%)
Enlargement of soft parts	17 (56.67%)
Densification of tissues	17 (56.67%)
Géodes	3 (10.00%)
Periosteal affixing	2 (6.67%)
Absence of lesions	3 (10.00%)

Fifteen patients (50%) underwent aspiration drainage before traction. No patient underwent a hip arthrotomy. The sequela was necrosis of the femoral head in 21 patients.

At the end of the 2-year follow-up period (range: 1–5 years), nine (30%) patients (four SS, two SC, and three AA) were seen to have experienced a good outcome and 21 (70%) (11 SS, five AS, and five AA) had a fair outcome. The average period of admission was 18 days, ranging from 2 to 35 days.

Discussion

Severe osteoarthritis of the hip joint may result in a major functional disability. Its frequency has been seen to vary from one patient series to another. In the series studied by Agossou-Voyémé [6], the incidence was found to be 73.3%, whereas in the present study it was 24.4%.

Osteoarthritis can occur at any age. It was predominant among children over 8 years of age (33%) in the series studied by Agossou-Voyémé [6] and among those less than 5 years (48%) in the report by Chen *et al.* [7], which compares favorably with the higher incidence seen in our study among children less than 6 years of age (73.33%). Boys are usually more commonly affected than girls [6–8]. This was confirmed in our study.

Osteoarthritis of the hip predominates in individuals with the homozygous SS genotype [8,9]. In a report by Sankaran Kutty *et al.* [10], osteoarthritis was shown to represent 11% of the complications of sickle cell disease. In our series, 50% of the affected patients were the homozygous for sickle cell genotype (SS).

The average time of 18 days (range: 2–35 days) before consultation was too long. Early presentation to the hospital is therefore important for the treatment to produce good results [11]. In Togo, poverty of parents may explain the delay in presentation. Parents bring their sick children to the hospital at a very advanced stage of the disease. This situation leads to complications or crippling functional sequelae.

The diagnosis of osteoarthritis may present a clinical dilemma. The association between fever and hip pain is an important indicator of osteoarthritis in a child, especially in the presence of sickle cell disease. Fever may result from a bacterial infection or malaria, which in the presence of sickle cell disease can trigger vaso-occlusive crises. A thorough physical examination is important for the diagnosis of osteoarthritis in a child. Physical examination of a child with a fever should include systematic examination of joints, including the hip, to make an early diagnosis for more effective management. Some important signs (in association with fever) include limitation of hip movement, muscular contracture, pain during hip mobilization, and limping (Table 1).

Poverty of parents and lack of technical equipment often hamper further clinical investigations/examinations. In our patient series, standard radiography was the only technique used for medical imaging because of its

accessibility and lower cost and because there was inaccessibility to emergency ultrasound despite the fact that the latter is the gold standard in the diagnosis of osteoarthritis of the hip [12,13]. Plain radiography has limitations and may show some lesions in varying proportions (Table 2). In contrast to the results reported by Filipe and Damsin [14], there was no case of femoral head eccentricity or dislocation of the hip in our study. Although scintigraphy with technetium-99 has excellent sensitivity in early diagnosis, its specificity remains limited [15]. This investigative facility is not yet available in Togo. CT and MRI can identify intra-articular effusion and articular infection, enabling the diagnosis of infection and musculoskeletal diseases before performing normal radiography in an evocative clinical context [15,16]. Unfortunately, our patients did not have the privilege of these services because of their unavailability in our hospital during the study period.

Salmonella spp. and *Staphylococci* spp. were the chief isolates in our study. However, in studies conducted at other regions, bacteria such as *Streptococcus* spp., *Pneumococcus* spp., *Haemophilus influenzae*, *Escherichia coli*, and *Klebsiella* spp. were the main isolates from children with osteoarthritis [6,17]. The reason for this difference is not known.

Therapeutically, the treatment modalities for septic osteoarthritis of the hip in children remain controversial; however, various techniques have been described to be effective in the literature.

Some authors advocate, in addition to antibiotics, surgical drainage by arthrotomy [18–20]. Drainage by arthroscopy if possible is preferred as it is a minimally invasive procedure and is associated with a shorter duration of hospital stay [21,22]. However, arthroscopy is still not available at our hospital. According to the study by Akakpo-Numado *et al.* [9], arthrotomy should be reserved for patients who have a thick discharge, which is difficult to drain out by puncture drainage. In our study, aspiration drainage associated with antibiotic therapy and immobilization of the hip sufficed to a large extent. None of the patients underwent an arthrotomy. Our belief was similar to that of the orthopedist from Nancy (France) [5]. Aspiration drainage, the least invasive of the treatment modalities, has been shown to produce good results in the hip, even though this is a deep, tight joint from which drainage is difficult. The prognostic criteria are difficult to identify. However, all authors agree that delayed treatment makes removal of intra-articular debris especially difficult [5]. Nevertheless, it should be recognized that aspiration drainage is effective in septic arthritis of the hip as long as basic principles such as delayed treatment and certain biological criteria are followed.

The majority of patients (70%) experienced only a fair outcome, reflecting the delay by parents in bringing their sick children to the hospital.

Conclusion

Septic osteoarthritis of the hip occurs in children at any age, more frequently among those belonging to the younger age group. The majority of children with osteoarthritis are of the homozygous sickle (SS) genotype. Early diagnosis and adequate antibiotic treatment are guarantors of a complete cure and good functional prognosis for the hip joint. Ideal diagnostic techniques such as ultrasound have not been used in this study because of their nonavailability.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

References

- 1 Akinyoola AL, Obiajunwa PO, Oginni LM. Septic arthritis in children. *West Afr J Med* 2006; **25**:119–123.
- 2 Kariminasab MH, Azar MS, Saravi MS. Surgical intervention for treatment of septic arthritis in infancy and childhood: a retrospective study. *Arch Iran Med* 2009; **12**:409–411.
- 3 N'gom G, Alumeti GM, Ndour O, Fall M, Bangoura I, Ndoeye M. Osteoarthritis at the Dakar teaching Hospital, epidemiological, clinical et radiological aspects about 21 cases. *Afr Fr J Ped Surg* 2008; **0**:16–20.
- 4 Forlin E, Milani C. Sequelae of septic arthritis of the hip in children: a new classification and a review of 41 hips. *J Pediatr Orthoped* 2008; **28**:524–528.
- 5 Journeau P, Wein F, Popkov D, Philippe R, Haumont T, Lascombes P. Hip septic arthritis in children: assessment of treatment using needle aspiration/irrigation. *Orthop Traumatol Surg Res* 2011; **97**:295–301.
- 6 Agossou-Voyemè A-K. Epidemiology of the serious hip disorders in children in Benin: prospective study of 180 cases over a 7 years period. *Rev Chir Orthop Reparatrice Appar Mot* 2001; **87**:539–543.
- 7 Chen CH, Lee ZL, Yang WE, Lin TY, Shih CH. Acute septic arthritis of the hip in children – clinical analyses of 31 cases. *Changeng Yi Xue Za Zhi*. 1993; **16**:239–245.
- 8 Ebong WW. Septic arthritis in patients with sickle-cell disease. *Br J Rheumatol* 1987; **26**:99–102.
- 9 Akakpo-Numado GK, Gnassingbe K, Songne B, Amadou A, Tekou H. Hip septic arthritis in young children with sickle-cell disease. *Rev Chir Orthop Reparatrice Appar Mo* 2008; **94**:58–63.
- 10 Sankaran-Kutty M, Sadat-Ali M, Kannan Kutty M. Septic arthritis in sickle cell disease. *Int Orthop* 1988; **12**:255–257.
- 11 Umer M, Hashmi P, Ahmad T, Ahmed M, Umar M. Septic arthritis of the hip in children – Aga Khan University hospital experience in Pakistan. *J Pak Med Assoc* 2003; **53**:472–478.
- 12 Egund N, Wingstrand H, Forsberg L. Computed tomography and ultrasonography for diagnosis of hip joint effusion in children. *Acta Orthop Scand* 1986; **57**:211–215.
- 13 Garcia J, Sinniger M. Role of computed tomography in soft tissue infections. *J Radiol* 1985; **66**:417–423.
- 14 Filipe G, Damsin JP. Surgery and orthopedics of the hip in the child. Montpellier: Sauramps Medical Edition; 1991. p. 415.
- 15 Pitter Barbier L. Osteoarticular infections. *Med Surg Encycl* 2000; **31** (218-A-10):16p.
- 16 Goergens ED, McEvoy A, Watson M, Barrett IR. Acute osteomyelitis and septic arthritis in children. *J Paediatr Child Health* 2005; **41**:59–62.
- 17 Deutsch AI. *Bone and soft tissue infection in MRI of the foot and ankle*. Vol 9: New York: Raven Press; 1992. pp. 199–222.
- 18 Givon U, Liberman B, Schindler A, Blankstein A, Ganel A. Treatment of septic arthritis of the hip joint by repeated ultrasound-guided aspirations. *J Pediatr Orthop* 2004; **24**:266–270.
- 19 Hernigou P, Odent T, Manicom O, Nogier A, Bachir D, Galacteros F. Total hip arthroplasty for the treatment of septic hip arthritis in adults with sickle-cell disease. *Rev Chir Orthop Reparatrice Appar Mot* 2004; **90**:557–560.
- 20 Abuamara S, Louis J-S, Guyard M-F, Barbier-Frebourg N, Lechevallier J. Osteoarticular infection in children: evaluation of a diagnostic and management protocol. *Rev Chir Orthop Reparatrice Appar Mot* 2004; **90**:703–713.
- 21 Nusem I, Jabur MKA, Playford EG. Arthroscopic treatment of septic arthritis of the hip. *Arthroscopy* 2006; **22**:902e1–902e3.
- 22 El Sayed AMM. Treatment of early septic arthritis of the hip in children: comparison of results of open arthrotomy versus arthroscopic drainage. *J Child Orthop* 2008; **2**:229–237.