Original Article

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Septic hip dislocations in children in a developing country

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ABSTRACT

Purpose: To report on a radiological issue and therapeutic aspects encountered in septic hip dislocations in a developing country. **Patients and Methods:** Nineteen children among whom 11 boys and 8 girls aged on average 5.3-years old presented 7 recent and 12 late hip dislocations. Those dislocations were distributed into in category 1: dislocations without associated lesion; category 2: dislocations associated with minor lesions; category 3: dislocations associated with major lesion. Ten children who presented an elevated erythrocyte sedimentation rate (ESR) received antibiotics. An arthrotomy was performed in children with a recent dislocation. Traction was performed in all children with an average duration of 5 weeks. The results were considered good, intermediate or bad using two parameters: ESR and reduction of dislocation. **Results:** 2 category 1 dislocations, 6 category 2 dislocations and 11 category 3 dislocations were noted. As concerns the recent dislocations, there were 2 category 1 dislocations and 5 category 2 dislocations. For late dislocations, 1 category 2 and 11 category 3 dislocations were recorded. There were 8 good results and 11 bad results. The good results concerned 7 recent dislocations and one late dislocation. The bad results concerned exclusively late dislocations. **Conclusion:** In children with septic hip dislocations, the good results concern almost exclusively recent dislocations but arthrotomy and immobilization must be done early.

Key words: Arthrotomy, hip, septic dislocation, traction

INTRODUCTION

The hip is a deep joint which accounts for difficulties to diagnose its related diseases. Infections are one of these diseases diagnosed late in Africa because they are usually taken to be malaria. In children, diagnosis is even more difficult because of the difficulty of locating the symptoms and sometimes the absence of fever.[1,2] These problems account for the delay in diagnosis and the discovery of these infections at the stage of complications such as dislocations. The aim of our study was to report on radiological aspects and management of septic hip dislocations in children in Dakar.

PATIENTS AND METHODS

Between June 1998 and May 2006, 19 children with a mean age of 5.3 years presented septic hip dislocation. There were 11 boys and 8 girls admitted on average 7 weeks after the onset of symptoms. The study of time to visits allowed us to categorize the cases in recent dislocations (less than 3 weeks) and late dislocations (more than 3 weeks). Seven recent dislocations and 12 late dislocations were noted. The clinical signs were pain (57.8%), lameness (89%), fever (36.8%) and swelling (78.9%). Erythrocyte sedimentation rate (ESR) revealed an inflammatory in 10 cases among which 7 recent dislocations and 3 late dislocations. Eleven patients presented leukocytosis ranged from 12000/mm^3 to 27200/mm^3. None of them had a quantitative measurement of C-reactive protein. Bacteriologic exam of articular pus has isolated staphylococcus aureus in 6 cases and *streptococcus i*n one case. All these children presented recent dislocation. Plain pelvis radiograph showed dislocation by using Putti and Ombredanne's lines [Figure 1]. We divided up children into three categories using Cottalorda's classification [Table 1], with some changes:

- Category 1: dislocation without associated lesions
- Category 2: dislocation with minor lesions
- Category 3: dislocation with major lesions

Minor and major associated lesions are shown in Tables 2 and 3. Dislocations could be high (16 cases) or only eccentric (3 cases). Hip ultrasonography showed

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effusion among children with recent dislocation. Children who presented an elevated ESR received oxacillin during 8 weeks and gentamycin during one week. Arthrotomy was performed in children who presented recent dislocation. Purulent effusion was evacuated and an irrigation drain was inserted in the hip joint. Synovial biopsy was performed in four children and showed a feature of a nonspecific synovitis. We did not perform pelvic or femoral osteotomy. All children benefited traction with an average duration of 5 weeks. A plain pelvis radiograph was performed at the end of the traction to verify if the dislocation was reduced or not.

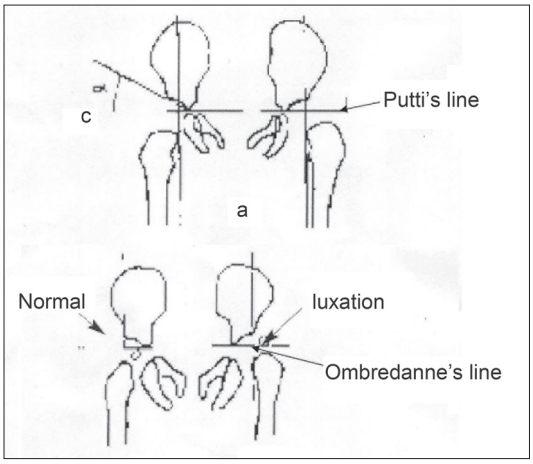


Figure 1: Putti and Ombredanne's lines

Table 1: Minor and major lesions according to Cottalorda

Groups	Lesions
Mi	Mild coxa magna, metaphyseal geode, minor osteochondritis, mild caput valgum, periostitis, osseous demineralization
Ma (Ma1, Ma2, Ma3)	Coxa vara, moderate osteochondritis, major osteochondritis, coxa magna, caput antetorsum, small femoral neck, severe caput valgum, coxa valga, coxa brevis, coxa plana, complete loss of the femoral head and neck, destruction of cotyle, creation of a neocotyle.

Table 2: Minor bone lesions

Minor bone lesions	Number
Moderate coxa magna	2
Geodes	6
Osseous demineralization	3
Periostitis	4

Table 3: Major bone lesions

Major bone lesions	Number
Severe coxa valga	2
Severe coxa magna	1
Destruction of femoral head and neck	5
Destruction of cotyle	3
Creation of a neocotyle	4

Traction was relayed by a plaster cast in case of dislocation reduction during 8 weeks. This was performed in seven recent dislocations and in one late dislocation. In case of failure of reduction, children were allowed to walk without or with forearm crutches.

The mean followup period was 5.2 years. Three children presented a pain among which two with late dislocation and one with recent dislocation. Results were considered good if dislocation was reduced with disappearance of inflammatory syndrome. They were intermediate if the dislocation was reduced but with persistent inflammation.

They were bad if the dislocation and the inflammation persisted. In these cases, limb-length discrepancy was evaluated.

RESULTS

There were 2 cases of category 1 dislocations [Figure 2], 6 category 2 dislocations [Figure 3] and 11 category 3 dislocations [Figure 4]. In recent dislocations, we noted 2 cases of category 1 dislocation and 5 category 2 dislocations. In late dislocations, there were 1 case of category 2 dislocation and 11 category 3 dislocations. Eight good results and 11 bad results were obtained. Good results were found in children with a recent dislocation and in a child who presented a late dislocation [Figure 5]. Bad results concerned only children with late dislocations. The average value of limb-length discrepancy was 2.5 cm (range: 1-4 cm). These children walked with compensatory heels.



Figure 2: Category 1 dislocation showing a hip dislocation without bone lesion



Figure 3: Category 2 dislocation showing a hip dislocation with a geode



Figure 4: Category 3 dislocation showing a hip dislocation with destruction of femoral head

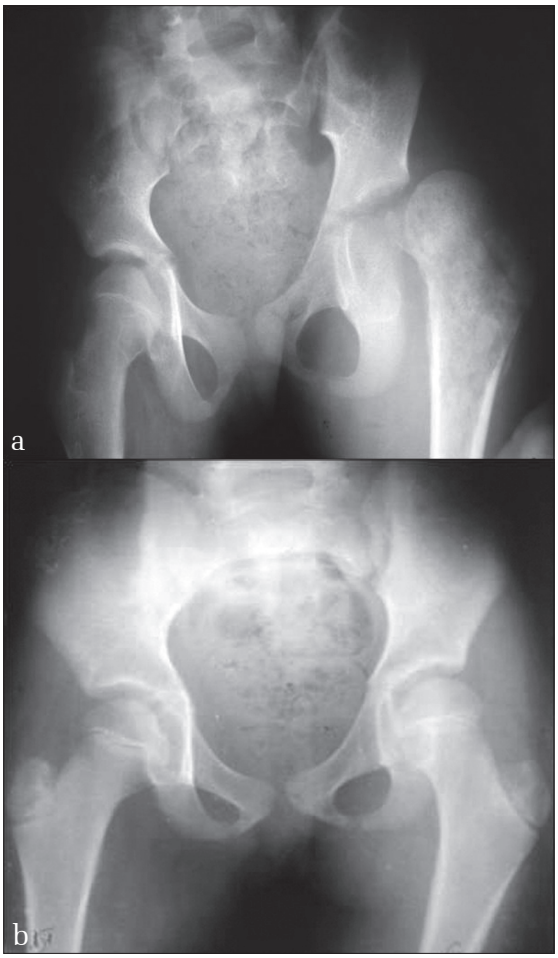


Figure 5: (a) Late dislocation before reduction; (b) Late dislocation after reduction using only traction

DISCUSSION

Septic hip dislocations can be isolated or associated with bone lesions. Category 1 hip dislocations are rare and are still encountered in recent forms. Moreover, they can be eccentric and may not be diagnosed if Ombredanne's and Putti's lines are not used. They can also be high but never exceeding the outer edge of the roof of acetabulum. Hip dislocations associated with bone lesions may be accompanied by minor lesions (category 2) or major lesions (category 3). Category 2 dislocations are mostly recent dislocations. Category 3 dislocations are only encountered in late dislocations. They are consecutive to wear or lack of support or destruction of femoral head and neck. In such cases, femoral head is more often above the outer edge of the roof of acetabulum.

The choice of antibiotics in our practice is based on the frequency of Staphylococcus in bone infections in the literature.[3,4] However, when the germ was isolated and antibiogram was performed, antibiotic has always been adapted.

Oxacillin and gentamycin are initially used in our practice in the treatment of bone and joint infections, unlike other studies.[5,6] They always help to control infection in view of normalization of ESR. Average duration of intake of antibiotics in our study was 8 weeks. This is high compared to literature data, which is 6 weeks.[7,8] This could be related by the choice of sedimentation rate as a reference laboratory test in the assessment of inflammation. Indeed, its normalization is very late compared to C- reactive protein. Arthrotomy is essential in recent dislocations because it allows, by evacuating pus, the reintegration of femoral head in the acetabulum. Therefore it must be performed early before the formation of muscular fibrosis or neocotyle. For late dislocations, arthrotomy is not very helpful because of the absence of pus. At best, arthrotomy in these cases could be used for synovial biopsy to investigate a tuberculous lesion.[9] Further attemps to

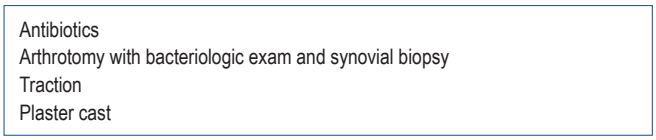


Figure 6: Category 1 dislocation

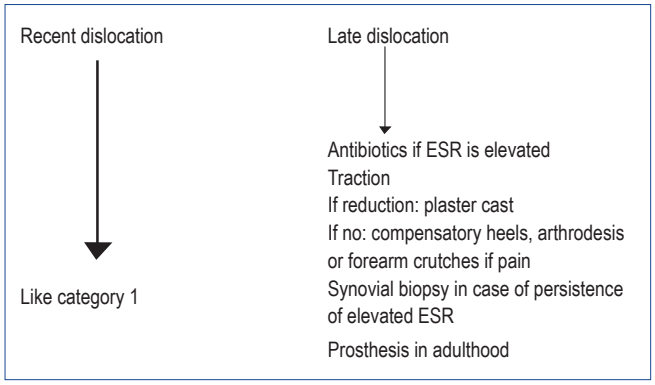


Figure 7: Category 2 dislocation

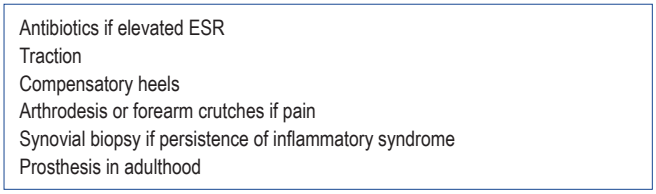


Figure 8: Category 3 dislocation

reduce dislocation could inflict irreversible damage to the femoral head. Sequellaes encountered in late dislocation can benefit from surgical procedures but results are mixed.[10,11] Outside of hip pain that can undergo arthrodesis, all other children can expect in adulthood to have prothesis. Similarly, in situation of neocotyle, if neoarticulation is sufficiently mobile, no therapy seems appropriate, since ultimately it is the good function that is targeted.

To the difference of Hua[12] who realize plaster cast just after arthrotomy, we rather do a traction before plaster cast because the children receive intravenous antibiotics. The goal of the traction was to maintain reduction after arthrotomy in recent dislocation. Traction has always helped to maintain reduction in recent dislocations about 5 weeks. In late dislocations the goal of traction was to reduce dislocation. It has only reduced one case of late dislocation. Failure of reduction in late dislocation could be related to the presence of muscular fibrosis fixing the femoral head in its new position or the creation of a neocotyle. However, traction can be useful in these late dislocations to limit vicious attitudes. After traction, all children in whom dislocation was reduced received a plaster cast in abduction and internal rotation. The average duration of plaster cast, in our study, which was 8 weeks is superior to that found by Bonnard[6] and Fielding,[1] This difference in the duration of immobilization is due to our concern for adequate contention. After these results we would like to recommend a treatment algorithm in each category [Figures 6-8].

CONCLUSIONS

In children with septic hip dislocation, good results concern almost exclusively recent dislocations but arthrotomy and immobilization must be done early. For late dislocations, traction can be helpful in limiting vicious attitudes. Arthrotomy can be performed only to do synovial biopsy to investigate tuberculosis.

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