

SLIPPED CAPITAL FEMORAL EPIPHYSIS: A REVIEW OF 40 CONSECUTIVE CASES AT THE NATIONAL ORTHOPAEDIC HOSPITAL ENUGU.

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ABSTRACT

INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is not a life threatening condition. However, untreated and complicated slipped capital femoral epiphysis can lead to deformity and early osteoarthritis of the hip. This can lead to considerable morbidity. Recent studies^{1,2,3} from other centers have described diagnosis, treatment and outcome. The aim of this study therefore, is to: establish the pattern of presentation of Slipped Capital Femoral Epiphysis in our environment, analyze the treatment given and its outcome, observe the complication arising from this condition and recommend ways of improved management.

PATIENTS AND METHODS

The case notes of patients who had Slipped Capital Femoral Epiphysis seen at National Orthopedic Hospital between January 1 2006 –December 2015(10years) were retrieved and analyzed

RESULT

There were Forty (40) Patients, Eighteen (18), Males and Twenty Two (22) Females with a Male Female ratio of 1:1.3 .The Range (in years) was 9 -16yrs (See Figure 1) with a Mean Age (M &F) of 12.9. The Mean Age for Females (F) is 12.55 years while that of Males (M) is 13.33. Eight (8) (20%) of our patients had Associated Conditions. The Average number of days before presentation was 134.2 days with a Range of 3 to 365 days .The Sides affected showed Fourteen (14)(35%) patients had the Left side affected while eighteen 18(45%) had it on the Right. Eight (8) (20%) patients had bilateral conditions. Thirteen (13)(32.5%) patients had Revision Surgery. Eleven (11)(27.5%)had Complications of the condition .

DISCUSSION

Our patients did not show any sex preference. This is in contrast to with the findings of Kelsey⁴ which revealed a propensity of the left hip to be involved in boys as against the right in our review. Majority (20%) of our patients had bilateral condition which is in keeping with most reports in the literature⁵

CONCLUSION

A retrospective review of Slipped Upper Femoral Epiphysis managed at the National Orthopaedic Hospital Enugu has been examined. Most of our patients presented late and avascular necrosis the major complication of the series. We will therefore recommend a high index of suspicion for physicians who see these patients primarily as the diagnosis is often subtle, and symptoms, such as groin or knee pain, can be misleading and also to create awareness as most of our patients presented to the Traditional Bone Setters at the early stages of the condition. We believe like Alvin⁶ postulated that early presentation will enable the surgeon intervene early and mitigate these complications.

Keywords: Slipped Capital Femoral Epiphysis, Pattern of presentation, Treatment and Outcome

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INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is not a life threatening condition. However, untreated and complicated slipped capital femoral epiphysis can lead to deformity and early osteoarthritis of the hip. This can lead to considerable morbidity. Amongst the known factors that increase morbidity are avascular necrosis (AVN) of the hip and chondrolysis. These aforementioned factors can lead to damage that is severe enough to warrant a salvage procedure, in the form of an arthrodesis or a total hip replacement. Recent studies^{1,2,3} from other centers have described diagnosis, treatment and outcome. Prompt diagnosis is critical to prevent further deformity and AVN. The diagnosis is often subtle, and symptoms, such as groin or knee pain, can be misleading. The aim of this study therefore, is to:

- a) Establish the pattern of presentation of Slipped Capital Femoral Epiphysis in our environment
- b) Analyze the treatment given and its outcome
- c) Observe the complication arising from this condition
- d) Recommend ways of improved management.

PATIENTS AND METHODS

The case notes of patients who had Slipped Capital Femoral Epiphysis seen at National Orthopedic Hospital between January 1 2006 – December 31 2015 (10years) were retrieved and analyzed, collecting data on number of Patients, etiology, sex, associated conditions, number of days before presentation, pre specialist hospital treatment, Sides affected, grade of slip, leg length

discrepancy, types of surgery and implant used and complications. We measured the clinical outcomes based on clinical assessment of bilateral hip motions for subjects operated unilaterally and without signs of an asymptomatic slip at follow-up.

All case notes with incomplete records were excluded from the study.

RESULTS

General Information: Table 1

There were forty (40) patients, eighteen (18), males and twenty two (22) females with a male female ratio of 1:1.3 .The range (in years) was 9 -16yrs (see figure 1) with a mean age (M & F) of 12.9. The mean age for females (F) is 12.55 years while that of males (M) is 13.33. Eight (8) (20%) of our patients had associated conditions. The average number of days before presentation was 134.2 days with a range of 3 to 365 days .The sides affected showed fourteen (14)(35%) patients had the left side affected while eighteen (18)(45%) had it on the right. Eight (8) (20%) patients had bilateral conditions. Thirteen (13)(32.5%) patients had revision surgery. Eleven (11)(27.5%) had complications of the condition .

Grade of Slipped Capital Femoral Epiphysis: Table 2

Eleven(11) (27.5%) of our patients had severe slip while ten(10)(25%) patients had moderate and nineteen (19)(47.5%) patients had mild Slip.

Associated Conditions: On presentation four (4) (50%) patients had coxa valga, two(2)(25%) were diabetic and (2)(25%) had sickle cell disorder.

Aetiology of Slipped Upper Femoral Epiphysis:

The slip in twenty-three (23)(57.5%)patients was due to trauma while in seventeen (17)(42.5%) patients it was non traumatic.

Pre Hospital Care of Patients with SUFE: Table 3

An analysis of where patients had treatment before presenting to us showed that 14 (35%) visited private hospitals, 12(30%), traditional bone setter (TBS), 1(2.5%) teaching hospital and 13 (32.5%) presented primarily to us.

Limb Length Inequality: On presentation the limb measurements showed 19(47.5%) patients with shortening while 21(52.5%) had none. The discrepancy showed a range of 1-3cm with an average of 2.5cm.

Type of operations: Table 7

The type of operations done on our patients showed that 31(77.5%) had pinning in situ(PIS), 25(12.5%), skin traction (ST) and 4(10.0%) valgus osteotomy + pinning In Situ(Val Os+PIS)

Type of implants used: The implant used for stabilization showed that compression screw was used in 11(31.43%), Knowles pins 13(37.14%)Kirschner wire, 7(20.00%) and Muller Harris plate in 4(11.43%) patients.

Clinical outcome

Thirty two (32) patients had surgery on one side without any signs or suggestions of involvement of the contralateral side . Movement in the operated hip was compared to that in the normal hip. We observed a mean reduction of $8^{\circ} \pm 5.5$ in internal rotation and a mean increase of $12^{\circ} \pm 4.8$ in external rotation for the operated hip. These values were not statistically significant ($P > 0.001$).

Complications sequel to SUFE: Table 9

Nine (22.5 %) of our patients had complications sequel to SUFE and the distribution of the complications were as follows: avascular necrosis (AVN) ,3(33.33%),coxa vara /valga, 3(33.33 %), osteoarthritis (OA), 1(11.11%),decreased range of motion (ROM), 2(22.22 %),

Post op Complications

Two (2)(5%).of our patients had wound infection

DISCUSSION

Our patients did not show any sex preference. This is in contrast with the findings of Kelsey⁴ whose study revealed a propensity of the left hip to be involved in boys. However our study showed that more of the right hips are involved. Twenty percent (20%) of our patients had bilateral affectation which is in keeping with most reports in the literature⁵. This calls for close monitoring of the opposite normal hip. Despite this we did not consider the pinning of the asymptomatic opposite side as we believed like most authors¹³ that the complications that may be encountered considerably outweigh the benefits in the child who is otherwise normal.

Our age range is 12.9 with a mean of 12.55 for Males and 13.33 for females which is slightly lower than 12.0 for boys and much higher than 11.2 for girls demonstrated by Loder⁵ et al. Twenty five percent (25%) of our patients had associated conditions like coxa valga, diabetes and sickle cell disorder. These are non specific associations as atypical SUFEs are those associated with renal/endocrine disorders or prior radiation therapy. However picking up these

conditions is important in management of these patients taking anesthetic issues into considerations. The etiology of SCFE in 57% of our patients showed there was a history of trauma, though we are aware that generally the etiology of SCFE is unknown and perhaps no single factor has been implicated. A lot of theories including trauma, mechanical factors, inflammation, endocrine disorders, nutritional deficiencies and renal and irradiations therapy have been suggested⁶. 65% of our patients had a pre specialist hospital treatment before presentation with 30% visiting the TBS and 47.5% of them presenting with limb length inequality. The reasons for this could be poor diagnosis in the early phase of symptoms.

Majority of our patients (77.5%) had stabilization in situ using mainly compression screws in majority of them, while Knowles pins, Kirschner wires, and Muller Harris plate in rest of the patients. This is in keeping with the work of Zahrawi⁷ et al who at follow-up evaluation demonstrated that 91.7% of their patients treated by pinning in situ had good or excellent results, as compared with 71.6% of the patients treated by epiphysiodesis. Twenty seven percent of our patients had avascular necrosis. Avascular necrosis and chondrolysis are the two most severe complications of slipped capital femoral epiphysis. Disruption of the lateral epiphyseal vessels are commonly associated with the acute slips and this leads to avascular necrosis. In chronic slips, avascular necrosis can occur as a result of treatment. Chondrolysis or cartilage necrosis can occur in untreated slips, but is often associated with spica cast immobilization or penetration of the

internal fixation screws into the joint space. The final outcome of avascular necrosis and chondrolysis is extremely poor for a patient. Therefore, the baseline of management of slipped capital femoral epiphysis is treatment by adequate techniques that have high rate of success with minimal risk of complications⁸. Another reason that may be adduced for the high rate of avascular necrosis in our patient is the issue of late presentation. Most of our patients had spent much time with the private hospitals and traditional bone setters who could not make the earlier diagnosis before arrival to our hospital hence many arrived with limb length discrepancies and complications

Avascular necrosis with the attendant osteoarthritis were the commonest complications observed in our patients as stated above though many also had decreased range of movement of the hip and the reasons for this as stated above may be due to late presentation. Howarth⁹ had stated that this complication is rare in untreated slipped upper femoral epiphysis, though Alvin⁶ has identified delay in diagnosis, the amount of displacement at point of diagnosis and the type of treatment as factors that are responsible for avascular necrosis. Hall¹⁰ and Lynch¹¹ had demonstrated an association between avascular necrosis and manipulation, reduction, and pinning in the patient who has acute slip. This is thought to be due to acute displacement which may cause the blood vessels in the femoral neck to kink. This also explains the decreased incidence in chronic slip which allows the accommodation of the blood supply as a result of slow progression of the slip. There is also a theory of tamponade of the blood supply to the proximal femoral epiphysis due to intracapsular hemorrhage. However there is no evidence that immediate aspiration of the hip joint is effective in preventing avascular necrosis.

Stambough¹² et al in their analysis of 80 patients with respect to pin placement has suggested superior lateral position of pin placement as a cause of avascular necrosis. In our series we didn't have the privilege of choice of placement as most of our patients came late and had pinning in situ irrespective of degree of slip.

CONCLUSION

Slipped Upper Femoral Epiphysis in our environment has been examined. Most of outpatients presented late and we had avascular necrosis as the major

complication of our series. We therefore recommend a high index of suspicion for physicians who see these patients primarily as the diagnosis is often subtle, and symptoms, such as groin or knee pain, can be misleading and also create awareness as most of our patients presented to the Traditional Bone Setters at the early stages of the condition. We believe like Alvin⁶ postulated that early presentation will enable the surgeon intervene early and mitigate these complications.

SLIPPED CAPITAL FEMORAL EPIPHYSIS

Table 1: General Information

No of Patients	40
M	18
F	22
M: F Ratio	1:1.3
Range	9 -16yrs
Mean Age (M &F)	12.9
Mean (F)	12.55
Mean (M)	13.33
Associated Conditions	8(20%)
Average number of days before presentation	134.2Days
Range	3 to 365
Sides	
<i>Left</i>	14(35%)
<i>Right</i>	18(45%)
<i>Bilateral</i>	8(20%)
Revision Surgery	13(32.5%)
Complications	11(27.5%)

Figure 1: Age Range of Patients with SCFE

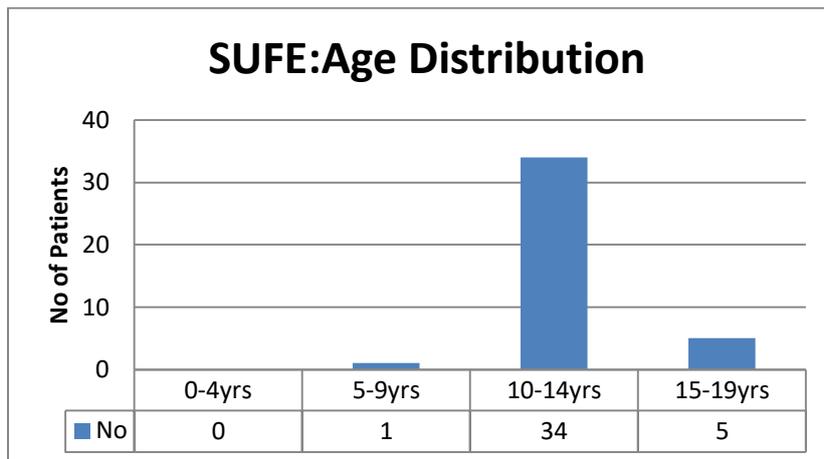


Table 2: Grade of slipped capital femoral epiphysis

Grade	No	Percentage
Severe	11	27.5
Moderate	10	25
Mild	19	47.5
Total	40	100

Table 3: Pre hospital care of our patients with SCFE

Institutions	No	Percentage
Private Hospital	14	35
Traditional Bone Setter(TBS)	12	30
Teaching Hospital	1	2.5
None	13	32.5
TOTAL	40	100

Table 4: Type of operations

Operation	No	Percentage
Pinning In Situ(PIS)	31	77.5
Skin Traction (ST)	5	12.5
Valgus Osteotomy + Pinning In Situ (Val Os+PIS)	4	10.0
Total	40	100

Table 5: Complications sequel to SUFE (No=9)

Complications	No	Percentage
Avascular Necrosis (AVN)	3	33.33
Coxa vara /valga	3	33.33
Osteoarthritis (OA)	1	11.11
Decreased ROM	2	22.22
Total	9	100

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