Femoral Shaft Fractures in Children Age 1-5 Years Treated with Single Leg Walking Spica, Our Experience.

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Each author of this article fulfilled ALL 04 Criteria of Authorship:
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ABSTRACT

Introduction: Femoral shaft fractures are common in children. These fractures are classified according to the area of fracture involved. The treatment of femoral shaft fractures depends upon the age of patient. In children less than 6 years of age, hip spica is the treatment of choice.

Methods: this prospective study was conducted in orthopedic unit DHQ hospital Khar Bajaur and Orthopedic department Peshawar Medical College, Peshawar from July 2020 till June 2021. All patients fulfilling the inclusion criteria were enrolled in the study. Single leg hip spica were applied by two experienced orthopedic surgeons. Followup was done. Spica was removed after 6 weeks.

Results: A total of 31 patients were enrolled in the study. Mean age was 3.8 years. 58% patients were male and 42% were female. 58.1% had middle 1/3rd femur shaft fracture. LLD was the most common complication (9.7%).

Conclusion: Single leg hip spica is simple, efficient and cost effective treatment for children less than 5 years of age.

Keywords: LLD (leg length discrepancy), femur shaft fracture, varus, valgus, hip spica.

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INTRODUCTION

In children, femoral shaft fractures are common[1]. The incidence of femoral shaft fractures is 19-26/100000 children[1-3]. Boys are affected more as compared to girls[1,3,4]. These fractures are classified according to the location as sub trochanteric fractures, shaft fractures and supra condylar fractures[5]. The femoral shaft fractures may be further divided into proximal, middle or distal 1/3rd fractures. These fractures may be transverse, spiral or oblique.

The treatment of femoral shaft fractures depends upon the age and size of children[1,]. Birth related femoral shaft fractures in newborns are treated with double diapers[1,6]. Pavlic harness is used for treating femoral shaft fractures between 1-6 months of age[6]. From 6 months to 6 years of age, hip spica is the standard treatment modality. Children above the age of 6 years are usually treated with surgery[1,4,7,8].

There are several disadvantages associated with hip spica casting[1,9]. There is increased burden on the family and care takers[9]. It may cause abdominal pain, itching and skin irritation. There may be soiling and breakage of spica. There may be unacceptable shortening and angulation. Rarely vascular compromise may occur[1,10,11]. Despite all these issues, hip spica is still the preferred treatment choice in pediatric femoral fractures. It is simple, cost effective and non invasive[1,12,13].

The traditional hip spica cast consists of one and half leg cast with a bar in between the legs, applied for 6-8 weeks period and patient is unable to bear weight[1],. Single leg walking spica cast, as described by Epps et al[14,15]. as an acceptable treatment for femoral shaft fractures, with decreased burden on family and care takers. The aim of our study is find out the effectiveness of single leg walking spica cast in the management of femoral shaft fractures in children age 1 -5 years.

MATERIALS AND METHODS

This prospective cross sectional study was done in orthopedic unit at DHQ hospital Bajaur and

Orthopedic department of Peshawar Medical college, Peshawar from July 2020 to June 2021. Approval from the ethical review committee of the hospital was taken in advance. Informed written consent was taken from the parents or guardian of the patients. All patients presenting to the emergency department having femoral shaft fractures were admitted in orthopedic unit. Patient data like name, age, gender and mechanism of trauma were noted on a preformed proforma. SPSS version 20 was used for statistical calculations.

The inclusion criteria was patients having closed femoral shaft fracture with age 1-5 years, both male and female, simple fractures and fractures involving only one side. The exclusion criteria was open fractures, pathological fractures, fractures treated somewhere else, bilateral femoral fractures, and comminuted or segmental fractures. Patients having head injury or other fractures were also excluded.

Cast was applied by two experienced consultant orthopedic surgeons in the operating room under sedation. Cast was applied from abdomen to area just above malleoli. Plaster of Paris was used for the cast and fiberglass was used above it for extra strength and support. Hip and knees were kept at 30-45 degrees of flexion and 30 degree abduction at hip. Post operative x rays were taken in AP and Lat views. Patients were discharged on the same day. Follow up was done on 1st weeks, 2nd week, and then after every two weeks. X rays were taken on each visit and looked for shortening, angulation, and deformity. At 4 weeks the children were mobilized and full weight bearing was allowed. Cast was removed at 6 weeks. Any leg length discrepancy and deformity was noted and calculated after cast removal. Final x rays were taken for signs of callous formation.

RESULTS

A total of 31 patients were included in the study. 18(58%) patients were male and 13(42%) were female. The mean age of patients was 3.8(3.5-4.190%CI) years. Table 1 shows the number of patients and the site of fracture involved. Table 2 shows the cause of fracture. Wedge adjustment was done in 3 patients. Recasting was done in 2 patients, one for soiling of the cast and another for cast break at hip level. At final visit 2 patients had shortening of 1.5 cm and 1 patient had shortening of 2cm. 1 patient had valgus deformity of 10 degree and 1 had varus of almost 7 degree. All patients had callous formation at 6 weeks.

Table 1: Site of femoral shaft fracture.

S. no	Site of femur fracture	Number of patients
1.	Proximal 1/3rd	8 (25.8%)
2.	Middle 1/3rd	18(58.1%)
3.	Distal 1/3rd	5(16.1%)

Table 2: Causes of fracture

S. no	Cause of fracture	Number of patient
1.	Fall from height (roof)	13(41.9%)
2.	Fall from tree	8(25.8%)
3.	Road traffic accident	5(16.1%)
4.	Fall from swing	3(9.7%)
5.	Hx of fight (hit by stick)	2(6.5%)

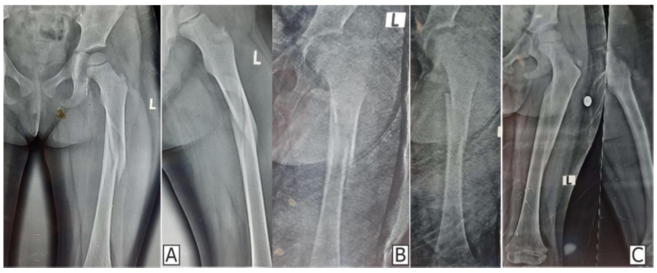

Fig. A: Femoral shaft fracture
Fig B: Femoral shaft fracture treated with sigle hip spica
Fig. C: Final xray after spica removal.

DISCUSSION

Femoral shaft fractures are among common pediatric fracture[1]. In our study, boys are affected more than girls. It is consistent with the other studies as well[5]. In Some studies, there is no difference in femoral fractures distribution in boys and girls[16].

In our study, the most common cause of fracture was fall from height. It is similar to majority of studies[5,17]. One study done in Karachi shows that the most common cause of femoral shaft fracture was road traffic accident[18], which is contrary to our study. In our study road traffic accident was the 3rd common cause of femoral shaft fracture.

In our study, the most common site of fracture was the middle 1/3rd. it is similar to another study[15]. In one study, done in Rawlakot Kashmir[5], the most common site of fracture was proximal 1/3rd.

In 3 patients, wedge adjustment was done on the 1st visit at 1week time. Wedge adjustment was done without anesthesia under image intensifier. At 2 weeks time, cast was changed in 2 patients. One was soiled, and in other case the spica was broken due to early weight bearing. At 6 weeks spica were removed from all patients. All patients had radiologically visible

callous formation after removal of hip spica at 6 weeks.

The complication rate in our study was 16%. (5 out of 31 patients). This complication is a bit higher as compared to other studies which showed a complication rate of 5-7%[14,15]. The most common complication was leg length discrepancy which was in three patients (9.7%). this is lower than other studies, where the LLD is 14-20%[5-19-21]. 2 had LLD of 1.5 cm and 1 had shortening of 2 cm. this LLD i.e less than 2 cm is acceptable in children. One patient had a valgus deformity of 10 degree while the other one had a varus deformity of 7 degree. All this is in acceptable range.

CONCLUSION

Single leg hip spica is an acceptable, simple and cost effective treatment modality for femoral shaft fracture. The complication rate is less.

Conflict of Interest: None

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