

Functional Outcome in Primary Hip Spica In Children Under 5 Years

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ABSTRACT

Introduction: Fractures shaft of femur in kids are common disorders faced by all orthopedic surgeons in their day to day observe. These fractures account for 7.6% of all pediatric fractures. Such fractures typically result from direct violence in most of the cases. Low energy traumas like fall from little heights or sports connected injuries in younger kids and high energy trauma like road traffic accidents in older kids are the common modes of injury in such fractures. About the management of those fractures below five years a wide variety of opinions exist. However, opinion still differs for kids between five to eleven years. **Objective:** To determine the outcome of primary Spica cast (immediate within 24 hours) in femoral shaft fractures in children in terms of frequency of shortening and malunion. **Study design:** Descriptive case series study. **Settings:** Orthopedic Department of Allied and DHQ hospital Faisalabad. **Duration:** 01-07-2014 to 30-06-2017. **Methodology:** After approval of study from hospital ethical review committee, informed consent was taken from the parents or guardians of children. All children with fracture of femur with age group 6 months to 10 years were admitted through emergency department of the hospital. After initial treatment following ATLS protocol, x-rays were taken from radiology department of the hospital. Patients were treated with primary Spica cast. After application of Spica cast patient was called after 6 weeks and assessed for any shortening or malunion at 6 weeks. Malunion was labeled if angulation on anteroposterior x-ray was more than 10 degree and on lateral x-ray was more than 30 degree and shortening of more than 2.5cm. All the information was recorded on proforma. **Results:** In this study, out of a total of 156 cases, 54.49%(n=85) were between 0.6 to 5 years and 45.51%(n=71) were between 6-10 years, mean±sd was calculated as 5.68±2.81 years, 58.97%(n=92) were male and 41.03%(n=64) were females. Frequency of shortening of length was recorded in 7.69%(n=12) while 92.31%(n=144) had no findings of the shortening. Frequency of malunion was recorded in 5.12%(n=8) while 94.88%(n=148) had no findings of the malunion. **Conclusion:** We concluded that the outcome of primary Spica cast (immediate within 24 hours) in femoral shaft fractures in children in terms of frequency of shortening and malunion is good and satisfactory with low frequency of these complications, it can be used in population as an effective method.

Keywords: Femoral shaft fractures, Children, Primary Spica cast, Shortening, Malunion

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INTRODUCTION

Femoral fractures account for approximately 2% of all childhood fractures. In most cases, the child must be hospitalized.¹ Most femoral fracture in children are closed injuries and traditionally have been treated by closed methods.² Immediate Spica cast application is an established treatment for isolated closed femur fractures.³ In children between 6 and 10-year-old, flexible intramedullary (inside the bone) nails are often used to stabilize the fracture. Other option that can lead to successful outcome in this situation include, a plate with screws that, bridges, the fractured fragments, an external fixator, this is often used if there has been large open injury to the skin and muscles.⁴

Conventional treatment of these injuries in children has been initial traction followed by immobilization with Spica cast. Interest in use of immediate or early Spica cast has increased after the work of Dameron and Thompson in 1959. Benefits of this approach are shortened hospital stay and treatment cost, prevention of complication of traction and surgery and early return of patient to their families.⁵

Immediate hip Spica has a tendency towards shortening and malunion, Skin breakdown, foot drop or even compartment syndrome so preliminary skeletal traction is recommended before Spica cast application, but it requires prolonged

immobilization which has negative psychological effects in children of this age group. It avoids the risk of anesthesia, surgery and complication of open wound. The results are comparable with Spica cast after traction.⁶ At the removal of cast, shortening ranged from 0.5 cm to 2.5cm in 71.42% children. Malunion was present in 11.4%.⁷ Another study in which all patients had Spica cast application within 24 hours of presentation has variable results in terms of shortening and malunion. Shortening of 5.1% versus 4.8% was seen in emergency department versus operating room department respectively and clinically apparent malunion was noted in 2.5% versus 0% in emergency versus operating room department.⁸ The Rationale of the study is that there are variable results in previous studies regarding use of primary Spica cast in fracture shaft of femur in children in terms of shortening and malunion so reason to research is to confirm the results in term of shortening and malunion. Spica cast application can be adopted as effective method.

METHODOLOGY

Study Design: Descriptive case series study.

Settings: Orthopedic Department of Allied & DHQ hospitals Faisalabad-Pakistan.

Duration: 01-07-2014 to 30-06-2017.

Data Collection Procedure: After approval of study from hospital ethical review committee, informed consent was taken from the parents or guardians of children. All the patients fulfilling the inclusion criteria were subjected to following common treatment. All children with fracture of femur with age group 6 months to 10 years were admitted through emergency department of the hospital. After initial treatment following ATLS protocol, x-rays were taken from radiology department of the hospital. Patients were treated with primary Spica cast.

In these patients, within few hours of admission, hip spica was applied in emergency department under sedation after consulting with senior registrar. After application of spica cast postoperative x-rays of femur was taken in same emergency department and reviewed by consultant doctor for shortening or overlap up to satisfactory level. After application of Spica cast patient was called after 6 weeks and assessed for any shortening or malunion at 6 weeks. Contact numbers were taken to ensure follow up. Malunion was labeled if angulation on anteroposterior x-ray was more than 10 degree and on lateral x-ray was more than 30 degree and shortening of more than 2.5cm. All the information was recorded on proforma by myself.

Data Analysis: All the Data were analyzed by SPSS 10. Mean and standard deviation was calculated for quantitative variables like age, frequency and percentages were calculated for all qualitative variables like gender, shortening and malunion.

RESULTS

A total of 156 cases fulfilling the inclusion/exclusion criteria were enrolled to determine the outcome of primary Spica cast (immediate within 24 hours) in femoral shaft fractures in children in terms of frequency of shortening and malunion.

Age distribution of the patients was done which shows that 54.49%(n=85) were between 0.6 to 5 years and 45.51%(n=71) were between 6-10 years, mean±Sd was calculated as 5.68±2.81 years. Table 1

Table 1: Age distribution (n=156)

Age (in years)	No. of patients	%
0.6-5	85	54.49
6-10	71	45.51
Total	156	100
Mean±sd	5.68±2.81	

Gender distribution was done which shows that 58.97%(n=92) were male and 41.03%(n=64) were females. Table 2

Table 2: Gender distribution (n=156)

Gender	No. of patients	%
Male	92	58.97
Female	64	41.03
Total	156	100

Frequency of shortening of length was recorded in 7.69%(n=12) while 92.31%(n=144) had no findings of the shortening. Table 3

Table 3: Frequency of shortening of length (n=156)

Shortening	No. of patients	%
Yes	12	7.69
No	144	92.31
Total	156	100

Frequency of malunion was recorded in 5.12%(n=8) while 94.88%(n=148) had no findings of the malunion. Table 4

Table 4: Frequency of malunion (n=156)

Malunion	No. of patients	%
Yes	8	5.12
No	148	94.88
Total	156	100

DISCUSSION

One of the most common fractures in trauma an orthopedic surgeon faces in his daily practice is the shaft of femur. These fractures account for 7.6% of all pediatric long bone fractures.⁹ Such fractures usually result from direct violence in most of the cases. Low energy traumas like fall from small heights or sports related injuries in younger children and high energy trauma like road traffic accidents in older children are the common modes of injury in such fractures. There are acceptable guidelines for these fractures below 5 years of age with unanimous consensus, but opinion varies for children between 5 to 11 years of age groups.¹⁰

Treatment of these injuries by any surgical means certainly requires more than two anesthesia and two operations along with the risk of surgical complications. Management in a hip Spica cast primarily or after an initial short period of traction requires a single short general or regional anesthesia. Virtually, any method of treatment will be successful if success is defined by healing of the fracture and resumption of usual activities because children fractures are doomed to heal.

We planned this study with the view that there are variable results in previous studies regarding use of primary Spica cast in fracture shaft of femur in children in terms of shortening and malunion so reason to research is to confirm the results in term of shortening and malunion. Spica cast application can be adopted as effective method.

In this study, out of a total of 156 cases, 54.49%(n=85) were between 0.6 to 5 years and 45.51%(n=71) were between 6-10 years, mean±sd was calculated as 5.68±2.81 years, 58.97%(n=92) were male and 41.03%(n=64) were females. Frequency of shortening of length was recorded in 7.69%(n=12) while 92.31%(n=144) had no findings of the shortening. Frequency of malunion was recorded in 5.12%(n=8) while 94.88%(n=148) had no findings of the malunion.

Our findings are in agreement with a study by Bajwa GR who recorded that Malunion was present in 11.4%.¹¹ Another study in which all patients had Spica cast application within 24 hours of presentation has variable results in terms of shortening and malunion. Shortening of 5.1% versus 4.8% was seen in emergency department versus operating room department

respectively and clinically apparent malunion was noted in 2.5% versus 0% in emergency versus operating room department.¹² Another study by Tripathi RB and co-workers¹³ hypothesized that management of femoral shaft fractures in children by primary hip Spica cast without initial traction is a safe, simple, reliable and cost-effective method of treatment and recorded overall satisfactory results in about 91% cases. They concluded that primary hip Spica cast method of treatment for pediatric femoral shaft fractures is safe, easily applicable and cost effective provided due care is adopted during application of the cast and strict regular follow up is done in initial phase. It can be easily practiced even at district hospital level by medical officers with short period of training at any orthopedic center.

R.P Singh et al¹⁴ in a study at Nepal Medical College Kathmandu in 220 cases had satisfactory outcome in more than 90% cases in a follow up period of 2-5 yrs. P Chaudhary in a study at Bir Hospital Kathmandu (2004-2006 AD) in 45 patients; had excellent result in almost 100% cases with very few minor complications.¹⁵

However, the results the current study revealed the outcome of primary Spica cast (immediate within 24 hours) in femoral shaft fractures in children in terms of frequency of shortening and malunion in our population and we are of the view that primary hip Spica cast method of treatment for pediatric femoral shaft fractures is safe, easily applicable and cost effective and suitable for our population with satisfactory frequency of union while the frequency of shortening of length is also in few cases.

CONCLUSION



We concluded that the outcome of primary Spica cast (immediate within 24 hours) in femoral shaft fractures in children in terms of frequency of shortening and malunion is good and satisfactory with low frequency of these complications, it can be used in population as an effective method.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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