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Paediatric femoral fractures treated by hip spica- Result of 42 patients

Umesh Yadav¹, Ajay Sheoran¹, Vasudha Dhupper², Ashish Devgan³, Ayush Gupta⁴, Mudit Nemani⁴

¹ Assistant Professor, Department of Orthopaedics, PGIMS, Rohtak-124001, Haryana, India

² Assistant Professor, Department of Biochemistry, PGIMS, Rohtak-124001, Haryana, India

³ Senior Professor, Department of Orthopaedics, PGIMS, Rohtak-124001, Haryana, India

⁴ Junior Resident, Department of Orthopaedics, PGIMS, Rohtak-124001, Haryana, India

Abstract

Background- For diaphyseal femur fracture, treatment options varies from conservative as hip spica or operative as nailing/plating. We analysed results of patients treated conservatively in a hip spica cast. **Material and Methods-** 42 patients, upto 5 years of age, with shaft femur fracture managed by hip spica cast were retrospectively analysed in terms of healing clinically and radiologically and complications, if any. **Results-** Fracture healed satisfactorily in all patients. Males were more affected and road side accident was most common etiology. Mean hospital stay was 3.5 days. Most common complication was skin breakage (33.3%) followed by cast soiling or breakage (14.3%) while shortening was seen in 2 patients and angulation in one patient. **Conclusion-** Despite newer and safer implants, hip spica remains safe and cost effective method for treatment of femur fracture in children.

Keywords: Hip spica, Paediatrics, Femur fracture, Conservative.

INTRODUCTION

Paediatric femur fractures are commonly encountered in orthopaedics with an incidence of 1.6%. Femur fractures are one of the common lower extremity fractures [1]. With increase in road traffic accidents, the incidence of paediatric femur fractures is also on rise. Although there are advancements in surgical techniques and implants but still hip spica remains an affordable and effective mode of treatment. Paediatric shaft femur can be managed with either conservatively or operatively depending on patient profile, age of patient and fracture pattern [2]. The American Academy of Orthopaedic Surgery recommends use of spica casting for children between six months and five years old for diaphyseal fractures [3]. Here we present our experience of 42 patients with femoral shaft fractures treated by immobilization in hip spica cast.

MATERIAL AND METHODS

In the present study we included all children of age less than 5 years of age with shaft of femur fracture in last three years treated by hip spica were included in study and retrospectively analysed radiologically and clinically. Those with pathological fracture and with age more than 5 years were excluded from study group. Fractures of proximal and distal femur were also excluded from the group. All 42 patients were hemodynamically stable and treated by hip spica cast. Spica cast was applied on spica table and check xrays were done to look for satisfactory reduction. Follow up were done at regular interval and spica was removed after radiological evidence of union. The patients were then allowed gradual mobilization and weight bearing.

RESULTS

Mean age of patient was 3.2 years ranging from 8 months to 5 years. There was slight predominance of right side (52.4%) as compared to left (47.6%). Males were 1.6 times more commonly affected than females. 74% cases were result of road side accident while rest injuries were sustained due to fall. Mean hospital stay was 3.5 days ranging from 1-7 days. Regarding fracture pattern, transverse fractures were most common (38.1%) followed by spiral type (33.3%) and oblique type (28.6%).

*Corresponding author:

Dr. Umesh Yadav

House no- 16/11 J, Medical
Campus, PGIMS, Rohtak-
124001, Haryana, India
Phone: +91-9813504034

Email:
drumeshyadav735@gmail.com

Table 1: Study Results

Parameter	Value (n=42)
Mean Age (Years)	3.2
Side	
Right	22 (52.4%)
Left	20(47.6%)
Sex	
Male	26 (61.9%)
Female	16 (38.1%)
Mechanism	
Road side accident	31(73.8%)
Fall	11(26.2%)
Mean Hospital Stay (Days)	3.5 (1-7)
Fracture pattern-	
Transverse	16 (38.1%)
Spiral	14 (33.3%)
Oblique	12 (28.6%)
Complications-	
Shortening	2(4.8%)
Angulation	1(2.4%)
Cast Breakage/Soiling	6(14.3%)
Skin complications	14(33.3%)
Pressure Sores	Nil
Joint Stiffness	Nil

On sequential follow up, shortening was seen in 2 patients with 14 mm in one and 16 mm in another. Although no specific fracture location / pattern can be attributed to those but in both the patients, spica was applied twice due to soiling and breakage. However no such correlation is documented in literature. Angulation as a complication was also noted in one patient which was significant clinically and radiologically. The most commonly reported complication from spica casting for paediatric femur fractures has been skin related complications like abrasions or pressure sore. In our study almost one third patients had skin related issues. Although most healed satisfactorily without any interventions. Cast breakage due to soiling was seen in 14.3% patients out of which half of the patients required reapplication of cast while reinforcement worked in rest of the patients.

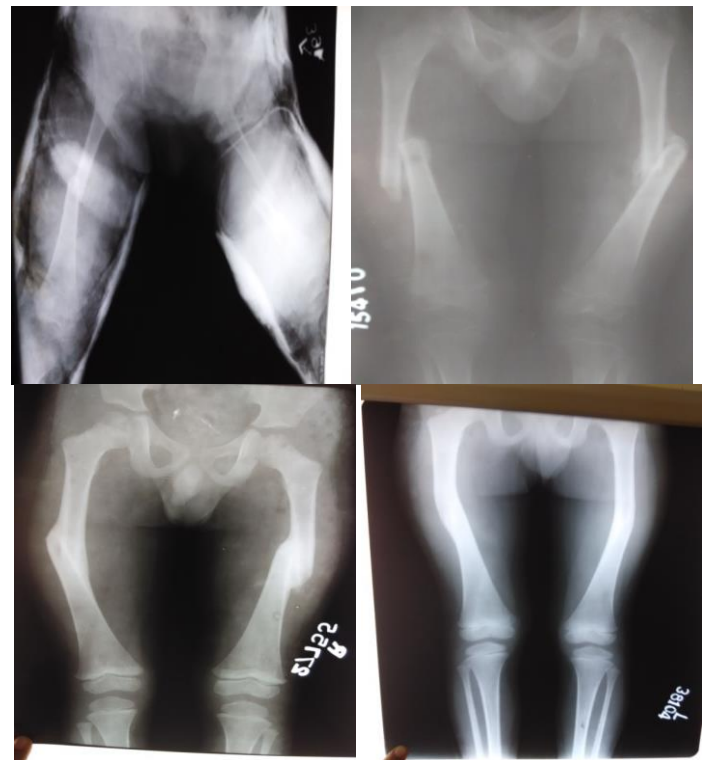


Figure 1: A 5-year-old child with bilateral shaft femur fractures treated with hip spica. Fracture healed well with no residual deformity

DISCUSSION

Treatment options for paediatric diaphyseal fractures varies from conservative to open reduction and internal fixation. Conservative methods includes immediate hip spica cast, traction followed by spica cast while operative interventions includes close reduction and osteosynthesis and fixation with plates/ intramedullary nails [4,5].

Since ancient times, spica cast has been used as effective treatment modality for paediatric diaphyseal fractures of femur. Numerous studies in past also reported excellent healing in children less than 5 years of age with spica casting alone. Road traffic accident still remains the most important cause of femur fracture in children. Male predominance and mean hospital stay 3.5 days is consistent with previous studies [6,7].

Table 2: Compares the complication rate of present study with studies in past

Study (Year)	Total patients	Shortening	Angulation	Skin Changes	Cast soiling/breakage
Ruhullah <i>et al</i> (2014) [8]	25	-	1 (4%)	3 (12%)	1 (4%)
DiFazio <i>et al</i> (2011) [9]	300	-	5 (1.6%)	77 (25.7%)	24 (8%)
Mansour <i>et al</i> (2010) [10]	100	-	26 (26%)	13 (13%)	6 (6%)
Epps <i>et al</i> (2006) [11]	45	5 (11.1%)	-	-	5 (11.1%)
Present study	42	2(4.8%)	1(2.4%)	14(33.3%)	6(14.3%)

As evident from above table, shortening is a complication which varies from zero to as high as 11.1% asdescribed by Epps *et al* in 2006 [11].The American Academy of Orthopaedic Surgeons Guidelines for the management of diaphyseal femur fractures in the paediatric population is to use spica casting for those with < 2 cm of shortening [3]. Angulation is another problem reported in literature with rates varying from 1.6% to 26%. Approximately 16° varus or valgus is accepted for patients under two years old, decreasing to 6° for adolescents treated with a spica cast. Still the most common complication remains skin breakage which is repeatedly reported in literature. Dur to poor hygiene, soiling of cast and further breakage is also seen which may require another cast

application. However other than socio-economic impact, no significant effect on healing is noted because of reapplication of cast. Although our study have few limitations like small sample size but still its results are consistent with the literature and proves that hip spica have excellent outcome in treating paediatric femoral fractures.

CONCLUSION

For developing countries like India, conservative methods like hip spica remains an effective treatment modality for treating paediatric femoral diaphyseal fractures. Although surgical intervention is associated with

better rehabilitation but noninvasive methods like spica are associated with fewer complications and equally effective functional outcome.

Conflicts of interest

The authors declare no conflicts of interest.

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None.

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