

Paediatric Shaft Femur Fractures Treated By Early Spica Cast.

K Muzafa, T Bhat, S Sharma, A Bhat, I Malik

Citation

K Muzafa, T Bhat, S Sharma, A Bhat, I Malik. *Paediatric Shaft Femur Fractures Treated By Early Spica Cast.*. The Internet Journal of Orthopedic Surgery. 2012 Volume 19 Number 2.

Abstract

Objective: To find out the advantages of early spica cast as a treatment for isolated femoral shaft fracture in children. **Study design:** Descriptive study **Place and duration of study:** Department of orthopaedics. Government medical college Jammu. **Patients and Methods:** 31 patients with a mean age of 3.2 years range (2months -10 years) with closed isolated femoral shaft fractures were included in the study. Patients having compound fractures and those with associated injuries were excluded from the study .spica cast was applied under general anaesthesia after preliminary skin traction, however immediate spica was given in children less than one year and those who had less than 2cm shortening on telescropy. Follow up was done in OPD after 1,4,6,10,12 weeks with check x-rays taken at every visit. **Results:** 31 children were included in the study, with a mean age of 3.2 years range (2months to 10 yrs.). Average duration of skin traction was 11.8 days range (0-21) days. Average duration of hospital stay was 13 days range (2-22) days. Average time for fracture union was 5.9 weeks range (4-12) weeks. At final follow-up 1 patient had LLD of 1.5 cm, 3 had LLD of 1 cm, 6 had LLD of 0.5cm, while 21 children had no LLD. None of the patients had short legged gait. None of the patients needed cast removal for any cast related complication. **Conclusion:** Traction followed by spica cast is a safe and effective method for closed fracture shaft of femur with very low risk of complication and should be recommended in children in less than 10 years of age.

INTRODUCTION

Fracture shaft of femur comprises 1.6% of all fractures in paediatric age group. Paediatric age group includes new born babies to 18 years old, and as such a variety of treatment options are available. Traditionally fracture shaft of femur in children have been managed conservatively .In recent times ,due to advent of new implants trend is towards treating these fractures surgically, but the surgical management is not without complications of infection and implant failure. Since children have very good fracture healing potential skin traction followed by spica cast gives good results and should not be excluded as a viable option for treatment in older children.

MATERIALS AND METHODS

This study was carried in department of orthopaedics Government medical college Jammu from March 2009 to August 2011. 31 cases with isolated closed fractures of shaft of femur were included in the study. Patients with compound fractures or polytrauma patients were excluded from the study. After admission immediate spica cast was given in children less than one year and in whom shortening of less

than 2 cm. was present on telescropy. In other children the injured limb was put on skin traction using weight appropriate for age, limb position was adjusted with sand bags. X-rays were taken after 4-5 days of skin traction to check fracture alignment.

After 7-21 days of traction, when fracture had become sticky, well moulded one and half spica was applied under GA. Acceptable alignments were according to age as follows.

Figure 1

AGE	VARUS/VALGUS (DEGREES)	ANTERIOR/POSTERIOR (DEGREES)	SHORTENING (mm)
Birth	30	30	15
2-5 yrs	15	20	20
6-10yrs	10	15	15
11 yr to maturity	5	10	10

Spica care instructions were given to parents before discharging the patients. Regular follow up at 1,4,6,10,12 weeks, with X-rays taken at each visit to monitor fracture alignment. After the spica was removed clinical examination was performed to evaluate gait, LLD, malalignment according to the recommended criteria.

RESULTS

31 children were included in the study, with a mean age of 3.2 years range (2months to 10 yrs.).19 were males and 12 females. Right side was involved in 20 patients and 11 had left side involvement. The mode of injury was fall in 19 patients and RTA in 12 patients. Average duration of skin traction was 11.8 days range (0-21) days. Average duration of hospital stay was 13 days range (2-22) days. Average time for fracture union was 5.9 weeks range (4-12) weeks. At final follow-up 1 patient (3.2%) had LLD of 1.5 cm, 3 (9.7%) had LLD of 1 cm,6 (19.35%) had LLD of 0.5cm ,while 21 (67.7%) children had no LLD. None of the patients had short legged gait.2 (6.4%) patients needed wedging of cast at second week to correct malalignment. One patient (3.2%) had superficial skin excoriation around perineal region. None of the patients needed cast removal for any cast related complication.

Figure 3

Table 2: mechanism of injury

PATIENT AGE IN YEARS	NO. OF PATIENTS
<1	2
1	4
2	5
3	9
4	5
5	2
6	2
7	0
8	1
9	0
10	1

Figure 4

Table 3: limb length discrepancy

Mechanism of injury	Number of patients
Fall	19
RTA	12

{image:4}

DISCUSSION

The management o femoral shaft fractures in children is controversial. Management based on age has been suggested with conservative management for children less than 5 years, surgery for more than 11 years. Treatment for 6-11 age group is controversial.

More recently trend is to treat such fractures surgically by plating or nailing. Surgical fixation of femoral fractures is not without risk of complications. Complications such as infection, growth plate disturbances and implant failure have been reported. Spica cast has been used successfully for

paediatric femur fractures since ages. It is much more simple and economical than operative methods.

Results of our study are comparable with other similar studies.

Sugi and cole have treated 191 children upto 10 years of age by spica cast .They included only middle third fractures for fear of malunion. We applied spica at all levels of shaft and did not find any difference in rate of malunion. They accepted upto 20 degree of anterior angulation, 20 mm of shortening and 15 degree valgus angulation, but no posterior angulation or varus. At removal of spica, shortening was seen in all of their patients. Shortening was seen in only 10 (32.2%) of our patients which was within acceptable limits.9 (4.7%) patients had complication due to spica, including pressure effects, malalignment of fracture and breakage of spica in Sugi and Cole study.3 (9.6%) of our patients had spica complication including skin excoriation and malalignment.At 4.5 to 8 year follow up all of their patients had shortening 9mm to 20 mm. We do not have long term follow up so long term results cannot be compared.

Jamaluddin in his prospective study treated 24 children aged 3 months to 10 years having fracture shaft of femur by early spica cast. He applied cast under sedation .The average hospital stay in the Jamaluddin study was 3.5 days. The average hospital stay in our study was 13 days. Shortening was seen in all patients, average 15 mm at the time of fracture union in the Jamaluddin study. Shortening was noted in 10 (32.2%) of our patients, with average of 2.4mm. Shortening in all patients and short hospital stay in his study may be due to early spica cast application, where as we applied cast after preliminary skin traction in children more than one year and children who had shortening of more than two cm on telescropy. we applied early spica cast in those patients only who were less than one year or had less than 2 cm shortening on telescropy. Angulation was within acceptable limits in all his patients, we observed the same in our study.

CONCLUSION

Traction followed by spica cast is a safe and effective method for closed fracture shaft of femur with very low risk of complication and should be recommended in children in less than 10 years of age.

References

1. Scherl SA, Miller L, Lively N, Russinoff S, Sullivan CM, Tornetta P. Accidental and non accidental femur fractures in children. Clin Orthop Relat Res 2000;376:95-105.

2. Dameron TB, Thompson HA. Femoral shaft fracture in children treated by closed reduction and double spica cast immobilization. *J. Bone Joint Surg* 1959;41B:1201-12.
3. Martinez AG, Carroll NC, Sarwark JF, Dias LS, Kelikian AS, Sisson GA. Femoral shaft fractures in children treated with early spica cast. *J Pediatr Orthop* 1991;11:712-6.
4. Jamaluddin M. femoral shaft fractures in children treated by early hip spica cast: Early results of prospective study. *Med J Malaysia* 1995;50: 72-5.
5. Lee YHD, Lim KBL, Gao GX, Mahadev A, Lam KS, Tan SB, Lee EH. Traction and spica casting for closed femoral shaft fractures in children. *J Orthop Surg* 2007;15:37-40.
6. Wilson NC, Stott NS. Paediatric femoral fractures: factors influencing length of stay and readmission rate. *Injury* 2007;38:931-6.
7. Corry IS, Nicol RO. Limb length after fracture of femoral shaft in children. *J Pediatr Orthop* 1995;15:217-9.
8. Near CS, Cadman EF. Treatment of fractures of femoral shaft in children. *JAMA* 1957;23:934-7.
9. Malik GM, Malik O. Operative treatment of malunited fracture of femur in a 65 days old infant. *J Surg PIMS* 1992;3:55-6
10. Mehdinasab SA, Nejad SAM, SarrafanN. Short term outcome of treatment of femoral shaft fractures in children by two methods: Traction plus casting, versus intramedullary pin fixation – A comparative study. *Pak J Med Sci* 2008;24:147-51.
11. Aziz A, Haider T. Treatment of closed femoral diaphyseal fractures in children by pins and plaster technique: A prospective study. *Pakistan Postgrad Med J* 2001;12:12-4.
12. Wong J, Boyd R, Keenan NW, Baker R, Selber P, Wright JG et al. Gait patterns after fracture of the femoral shaft in children, managed by external fixation or early hip spica cast. *J Pediatr Orthop* 2004;24:463-71.
13. Sugi M, Cole WG. Early plaster treatment for fractures of the femoral shaft in childhood. *J Bone J Surg* 1987;69-B:743 5.
14. Newton PO and Mubarak SJ. Financial aspects of femoral shaft fracture treatment in children and Adolescents. *J Pediatr Orthop* 1994;14:508-12.
15. Edvardsen P, Syversen SM. Overgrowth of the femur after fracture of shaft in child hood. *J Bone Joint Surg* 1976;58B:339-42.
16. Reynolds DA. Growth changes in fractured long bones. *J Bone Joint Surg* 1981;63B:83-8.
17. Clement DA, Colton CL. Overgrowth of the femur after fracture in child hood. *J Bone Joint Surg* 1986;68-B:534-6.
18. Wallace ME, Hoffman EB. Remodeling of angular deformity after femoral shaft fractures in children. *J Bone Joint Surg* 1992;74-B:765-9.
19. Davids JR. Rotational deformity and remodeling after fracture of the femur in children. *Cl in Orthop* 1994;302:27-35.
20. Weiss APC, Schenck RC Jr, Sponseller PD, Thompson JD. Peroneal palsy after early cast application for femoral fractures in children. *J Pediatr Orthop* 1992;12:25-8.

Author Information

Khalid Muzafa

Postgraduate scholar, Deptt. Of Orthopaedics, GMC Jammu

Tariq Ahmad Bhat

Resident, Deptt. Of Orthopaedics, GMC Jammu

Sudesh Sharma

Professor and Head, Deptt. Of Orthopaedics, GMC Jammu

Abedullah Bhat

Postgraduate scholar, Deptt. Of Orthopaedics, GMC Jammu

Irfan Malik

Postgraduate scholar, Deptt. Of Orthopaedics, GMC Jammu