

A Study of Management of Pediatric Femoral Diaphyseal Fractures with Flexible Intramedullary Titanium Elastic Nail.

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Abstract:- Femoral diaphyseal fracture accounts for 1.6% of all childhood fracture. Traditionally, the treatment for closed femoral shaft fractures in children was a period of traction until signs of healing were seen on x-ray followed by hip spica casting immobilization for 6–12 weeks. This led to long hospitalizations and prolonged periods of bedrest leading to cessation of the childhood routine activities. But nowadays flexible intramedullary titanium elastic nailing has become treatment of choice for pediatric femoral diaphyseal fracture especially in age group 5-12 years. Hip spica casting is restricted for age group 3 months to 5 years. Flexible intra medullary titanium elastic nailing provides a more biological environment for healing with micro-motion leading to greater callus formation. It is simple, effective and less invasive. It allows rigid fixation, faster healing, minimal hospital stay, rapid ambulation and early return of the child to daily routine activities. There is minimal disruption of family life and has better psycho socioeconomic outcomes. Functional results are excellent and complications are very less.

Keywords:- femoral diaphyseal fracture, hip spica casting, titanium elastic nail.

I. Introduction

Pediatric femoral diaphyseal fractures are common in all pediatric age groups. They account for 1.6% of all childhood fractures[1]. The treatment depends upon age of the patient, fracture pattern, degree of soft tissue injury and other associated injuries[2]. Treatment options include hip spica casting, traction, flexible intramedullary nails, reamed intramedullary rods, open reduction and internal fixation with plating and external fixation[3]. Traditionally, the treatment for closed femoral shaft fractures in children was a period of traction until signs of healing were seen on x-ray followed by hip spica casting immobilisation for 3–12 weeks. This led to long hospitalizations and prolonged periods of bedrest leading to cessation of routine childhood activities[4]. Flexible intramedullary titanium elastic nailing of femoral shaft fracture in children provides a more biological environment for healing with micro-motion leading to greater callus formation[5]. It is simple, effective and less invasive. It allows rigid fixation, faster healing, minimal hospital stay, rapid ambulation and early return of the child to daily routine activity. There is minimal disruption of family life and has better psycho socioeconomic outcomes. Functional results are excellent and complications are very less[6].

II. Material & Methods

In this study 12 patients in the age group 5-12 years were treated with closed reduction and internal fixation for femoral diaphyseal fracture with flexible intramedullary titanium elastic nail from period of March 2015 to April 2016. After initial stabilization of patients following ATLS protocol, routine plain radiographs AP & Lateral views were taken of full length femur including hip and knee joint to rule out other associated injuries around neck of femur etc. All patients were routinely investigated and operated once patient was fit for surgery. Pre-operative and post-operative data collected in the form of radiographs, duration of immobilization, duration of non-weight-bearing, ROM at hip and knee, limb length discrepancies and complications (non-union, delayed union). Results were assessed both clinically and radiologically. All patients followed till union of fracture. Follow up period was from 6 months to 9 months.

III. Results & Discussion

4(33.4%) patients were in 5-7 year age group while 5(41.6%) patients were in 8-10 year age group and 3(25%) patients were in 11-12 year age group. The youngest patient was 5 years old and oldest patient was 12 year. 8 patients were males and 4 patients were females. Left femur was involved in 7(58.4%) patients and right femur in 5 (41.6%) patients. Road traffic accident was most common mode of trauma in 9(75%) patients and fall in 3 (25%) patients. In our study 6 (50%) cases had mid one third femur shaft fracture, 3 (25%) cases had proximal one third fracture and 3 (25%) had distal one third fractures. This study was conducted to assess the results of flexible intramedullary titanium elastic nail fixation of femoral shaft fractures in pediatric age group. Union was achieved in all patients within 6 months. Among complications, 2 patients developed pain at

nail insertion sites initially which got better with time. Full ROM of hip and knee achieved in all 12 patients. No patient in our study developed major limb length discrepancy.

IV. Conclusion

Hence we conclude Flexible intramedullary titanium elastic nailing is treatment of choice for paediatric diaphyseal femoral fractures in age group 5-12 years[7]. It triggers faster union and gives stability which is good for early mobilization with lower complication rate[8]. It is a simple, easy, rapid, reliable and effective method for management of paediatric diaphyseal femoral fractures between the age of 5 to 12 years, with minimal blood loss, lesser duration of hospital stay and early return to activity[9]. Because of rapid mobilization, faster healing and minimal disturbance of bone growth, flexible intramedullary titanium elastic nail is considered to be a biological method to promote fracture healing[10].



Case 1 Pre-operative Radiograph.



Post-Operative Radiograph



Last follow up radiograph with union.



Case 2 Pre-operative Radiograph



Post-operative Radiograph



Last Follow-up radiograph with union.



Case 3 Pre-operative Radiograph



Post-operative Radiograph



Last follows up radiograph with union

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