

Portable Gallows' traction and hip spica cast for the treatment of femoral shaft fracture in children : an experience from Nepal

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Abstract : Almost 85% of Nepalese live in the rural areas where people have to work on daily basis to survive and they can't stay at hospital for long time for the care of their injured children. We have an innovative method of treatment like portable Gallows' Traction and hip spica cast for the treatment of femoral shaft fracture. From November 2003 to October 2008, total of 73 cases of shaft of femur fractures in the children, aged between 4 months to 3 years with mean age 1.9 years, were treated with this method. Patients were admitted initially for two days for the application of Gallows' Traction. The children's were discharged on the traction and called for follow-up after three weeks for the hip spica cast application. All fracture united clinically and radiologically in six weeks time. Distal leg, foot swelling were seen on five cases; skin laceration was seen on four cases. Complications like neuro-vascular impairment, shortening of the leg, angular deformity were not seen. This method is economical as patient party doesn't need to stay at the hospital and the hip spica cast was also applied on the out patient basis. Good union was seen with negligible complications.

Introduction

Femoral shaft fractures in children account for 3% of all paediatric fractures. It takes a high-energy force to break the femur, such as a car accident or a fall from a height¹³⁾. Mid-shaft fractures are most common, followed by proximal and distal fractures.

Femoral shaft fractures occur two to three times more in boys than in girls and more often in the left leg⁵⁾⁶⁾. Most fractures occur as a result of

trauma and treatment has often meant a long hospital stay. Fractures in children of pre-walking age can be caused by non-accidental injury²⁾⁷⁾.

The aims of treating femoral shaft fractures are to achieve bony union in an acceptable position that will restore normal function of the limb for all activities. Early intervention in the treatment of femoral shaft fractures involves a general anesthesia for either the application of a hip spica cast or for surgery usually within the first few days

Key words : Femoral shaft fracture in children, Portable Gallows' traction, Hip spica

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Fig. 1.
Locally made portable
Gallows' traction system

after admission to hospital¹²⁾. The operative treatments include intramedullary flexible nails, external fixation, open reduction internal fixation with plates and early application of plaster hip spica under general anaesthetic¹⁴⁾. The choice between non-operative and operative treatment depends on age, weight, localization, type of fracture and soft tissue damage⁹⁾. Unanimity exists about conservative treatment in children under four years of age or under 20 kg. This can consist of Bryant traction, but immediate hip spica cast or a Pavlik harness are other possible alternatives¹³⁾¹¹⁾.

Nepal is a developing country and one of the poorest countries in the world. Almost 85% of inhabitants live in the rural areas where people have to work on daily basis to survive by themselves and for their family. Operative treatment is very costly for these people and they can't stay at hospital for long time for the care of their injured children so we need innovative method of treatment for the fractures of shaft of femur in children. Portable Gallows' (Bryant's) traction could be one of the alternative methods. We have been using this method for the treatment of femoral shaft fractures in children under three years old. The results of this treatment are presented in this report. The aim of our retrospective study was to analyze the safety and efficacy of portable home traction followed by



a
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b



Fig. 2.
The position of the children on the Gallows' traction

hip spica cast as treatment of femoral fractures in small children.

Materials and Methods

From Nov. 2003 to Oct. 2008, total of 73 cases of shaft of femur fractures in the children, age ranges from 4 months to 3 years with mean age 1.9 years, were treated with this fraction. There were 45 boys and 38 girls. Left affected on 50 cases and right side affected on 23 cases. Five cases were bilateral involvement and the remaining cases were only unilateral involvement. All the open fractures were excluded from the study. Patients with head injury, ipsilateral tibia fractures, femoral fracture associated with blunt abdominal and chest injuries were excluded from the study. Clearance from the ethical committee also was taken to conduct the study.

Data were collected from patient charts and office notes and stored in a database.

Patients were admitted initially for two days for the application of Gallows' Traction ; and traction care with other nursing care were taught to the patient party. The Gallows' Traction was applied without anesthesia and the method was

similar to that described by Holmes³⁾. The children's were discharged on the traction after confirming the patient party can perform good nursing and other care. Patients were called for follow up after three weeks for x-ray evaluation and application of hip spica cast.

The main types of injuries were trauma in or around the house, road traffic accidents (RTA) and other reasons. Data regarding location, type, sort of fracture, and associated injuries were collected. The reduction was assessed immediately after application of the Gallows' Traction and discharged. Hip spica cast was applied after confirming good callus formation in the x-rays for the next three weeks.

Consolidation was defined as radiological disappearance of the fracture. The leg length and possible rotational deformity was measured clinically and angular deformity on the radiograph.

Results

All fractures united within six weeks of time. No complications like Volkmann's ischemic injury were seen. All the fractures united on the acceptable angular and rotational deformity. Seven patient had shortening of the leg with average being 1.2 cm but not significant clinically, no shortening was seen in other patient.

Distal leg foot swelling was seen on 5 cases and the patients were brought to the hospital by the patient party. The traction stripping was adjusted and patient party was told to do close observation for any fatal changes of the complication. No admission was needed for this complication. Skin laceration was seen on 4 cases which were found in three weeks time while giving hip spica cast. The laceration was quiet severe in one patient who was crying for the last few days

reported by the patient party. By giving betadine painting and covered by sterile gauge, hip spica could be reapplied. Oral antibiotics was given for one case. The patient parties were told to give close observation for any fatal complication. No other complications were seen after giving hip spica.

Discussion

There are many methods for the treatment of femoral shaft fractures in children. Conservative methods include Bryant (Gallows') traction, Russell traction, and 90°-90° traction and the invasive methods include intramedullary pinning, plating, and external fixation etc.

After the first publications from Nigeria and Great Britain, mobile portable home traction has been successfully used in the treatment of congenital dislocations of the hip and femoral shaft fractures³⁾⁸⁾. However, this treatment method has not been applied in most countries due to various reasons. For severe complications like Volkmann's ischaemia and skin slough, this technique was abandoned by several clinicians⁴⁾. But we didn't find any such severe complications like ischemia after applying the Gallows' Traction and hip spica cast.

Distal leg foot swelling was seen on five cases while in Gallows's traction. These children were brought to hospital by patient party. The traction was adjusted and patient parties were told for close observation for any changes. Later on, no other complications and changes were seen.

Skin laceration was seen on four cases which were found in three weeks time while giving hip spica cast. This was managed by giving betadine painting and application of sterile gauge bandage.

Seven patients had shortening of the leg with an average being 1.2 cm but not clinically

significant. Schreerder¹⁰⁾ reported one patient with 3 cm of shortening and was treated with shoe adjustment. In our patient, no such adjustment was needed. He found significant difference in the economical condition between the patient groups who were treated as home traction and treated in hospital. But we treated all patients as a home traction only.

Our clinical experience with this method is very satisfying and can be applied at home safely with good results and many advantages. The parents were very pleased with the treatment of their child at home as they didn't spend time in hospital and also this method was very economical. The prerequisite for a successful home traction treatment must be (1) the selection of parents and patients, (2) thorough instructions to the parents, (3) good information to the first line medical care providers, and (4) easy access to the hospital in case of parental uncertainty as described by Schreerder¹⁰⁾.

Conclusion

Portable Gallows' Traction is economical as the patient party doesn't need to stay at the hospital for the care of the child and then the hip spica cast was applied on the out patient basis. Sound fracture union was seen with negligible complications. This method is a safe, simple and effective with good results.

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