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FRACTURES OF THE PROXIMAL THIRD OF THE FEMORAL SHAFT IN CHILDREN.

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The records of 68 children with fractures of proximal third of the femoral shaft treated by three different methods were studied. Twenty patients were treated by longitudinal skin traction (Group A), eighteen had 90-90 skeletal traction (Group B), and in thirty the fracture was fixed by AO dynamic compression plate (Group C). The results of these methods were assessed clinically and radiologically. The mean length of follow up was 2.6 years (range 1 to 9 years). The hospital stay and the time required for independent ambulation was significantly shorter in the surgically treated patients. All patients showed satisfactory healing of the fracture within 3 months. But the incidence of malunion was high in group A (50%), and group B (36%). All patients in group C showed healing of the fractures without angulation or rotation. Based on the advantages gained by open reduction and internal fixation we conclude that plate osteosynthesis is a reliable and effective method and may be considered as a definite treatment. Bahrain Med Bull 1995;17(4):

Fracture of the femoral shaft is a common injury in children[1]. These fractures are generally managed by conservative treatment in the form of traction and casting with good results[2]. But in the proximal third malunion is common as the traction often fails to align the fracture. Therefore, the place of internal fixation in the management of displaced fractures is gaining strong support[3]. This study compares the results of three different methods used in the management of these fractures in children. The aim is to draw attention to the drawbacks of conservative treatment and emphasize the advantages of early internal fixation.

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METHODS

We reviewed the records of 68 children with fracture of proximal third of the femoral shaft treated at King Khalid University Hospital Riyadh, Saudi Arabia from January 1985 to December 1990. The children were treated either by longitudinal skin traction, 90-90 skeletal traction or by AO compression plate.

The records were reviewed for the number of days in traction, total hospital stay, number of days in cast following traction and time required for independent ambulation. Time required for union and presence of malunion was determined by examining the radiographs.

The patients were divided into three groups depending on the method of treatment received.

Group A. Longitudinal skin traction

Twenty patients were initially treated by this method. In twelve patients, acceptable reduction of the fracture could not be achieved (Fig 1), therefore in eight patients skin traction was changed to 90-90 skeletal traction and four patients underwent plate osteosynthesis. At three weeks, under anaesthesia hip spica plaster cast was applied and kept for an average 5 weeks.

Group B. 90-90 skeletal traction

Eighteen patients were initially treated by this method. In four patients reduction was not satisfactory (Fig 2) therefore, they were treated surgically by plate osteosyn-thesis (Fig 3). The traction was removed after 5 weeks followed by the applications of hip spica plaster cast for an average of 5 weeks.

Group C. Open Reduction and Internal Fixation

Thirty eight patients were operated and had fixation of the fracture by AO dynamic compressions plate. The plate was removed after a mean period of 10 months.

RESULTS

There were 46 boys and 22 girls with 38 fractures in the left and 30 fractures in the right femur. The age of the patients ranged from 5 to 15 years (mean 9.6). The average follow up was 2.6 years.

Table 1 show the number of patients in the 3 groups as well as the average time of traction, hospital stay and ambulation.

Table 1
No of patients in 3 groups with average time of traction, hospital stay and ambulation

Group	Initial No of patients	Final No of patients	Average time on traction (week)	Total hosp. stay (days)	Average time for inde-pendent ambulation (weeks)	Average time in a cast (week)
A	20	8	3	19	12	5
B	18	22	3.5	24	16	5
C	30	38	--	7	6	-

All the fractures treated by the three different methods healed in 10-14 weeks time.

Malunion

According to the criteria of malunion described by Hendon et al[2] as shortening of more than 2 cm, angulation in the frontal plane of more than 10 degrees or angulation in the sagittal plane of more than 20 degrees, 4 (50%) patient in Group A and 8 (36%) patients in Group B developed malunion.

Range of Movements

All the patients in group C had unrestricted movement in the hip and knee joints. But in group A and group B there was significant stiffness of these

joints. After a course of physiotherapy they were able to ambulate independently in 12 to 16 weeks.

Hospital stay

Group A spent an average 19 days, while group B and group C spent 24 days and 7 days respectively.

Complications

There was no wound infection in group C. One plate broke after fracture healing.

DISCUSSION

Malunion is a common problem in the fracture of the proximal third of femoral shaft because of anterolateral displacement by the action of iliopsoas and abductor muscles. Non operative treatment was the method of choice for these fractures, but recently there is a trend to treat these fractures by internal fixation[2,3,5]. Ligier et al[5] used intramedullary nail for the treatment of these fractures and showed satisfactory results, but Gross et al, and Pease recommended its use in middle third of the femur[6-7].

The reported incidence of malunion in patients treated by non operative methods varies from 12% to 29%[2,8]. We experienced malunion in 50% of the cases in group A and 36% in group B. However, early radiographs are not good indications for the incidence of malunion. With longer follow up there is no doubt that angular deformity and shortening would correct spontaneously. Wallace et al reported that up to 25o angulation in children of 12 years or younger will remodel satisfactorily[11].

Internal fixation is a good solution for these fractures, reducing hospitalisation time, maintain anatomic alignment and allow active motion at hip and knee joints. Of the 68 patients in this study 38 were treated by plate osteosynthesis. It offers the possibility to produce anatomic reduction and rigid fixation without interfering with the trochanteric apophysis as reported in cases treated by intramedullary nailing[3,9]. No deep infections occurred in our series. Ziv and Rang, however reported that three out of five plate osteosynthesis were infected due to numerous tubes attached to the patients and they recommended the use of prophylactic antibiotics[9]. Hansen reported only one case with superficial infection in 12 patients treated by plate osteosynthesis[10].

Rued and Luscher reported 92% good results in a study of 103 cases of femoral shaft fractures fixed by dynamic compression plate which are similar to our results[9]. Excellent results with short hospitalisation also reported by Hansen[10].

CONCLUSION

By reviewing the final results of all methods of treatment that there is no significant difference in terms of healing, but it is evident that the conservative method takes longer time for rehabilitation. Considering the advantages of operative treatment we recommend internal fixation by dynamic compression plate as safe and reliable method of treatment in displaced fractures. Conservative treatment in children has a place when it is possible to obtain acceptable position.

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