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Case Report

A rare case of traumatic neck of femur fracture in paediatric patient

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Abstract

Introduction: Traumatic neck of femur fracture occurs following high velocity trauma and fall from height, but it is very rare event. We report a case in 7 year old girl who got neck of femur fracture following fall from height and underwent closed reduction and internal fixation.

Case Report: A 7year old girl came with left sided hip pain with history of trauma 4 days back. She had difficulty in moving left lower limb and was not able to bear weight since then. After doing xray patient was diagnosed having left neck of femur fracture. Patient was admitted for fracture neck of femur.

Conclusion: It is a rare condition. Neck of femur fracture in child occurs following high velocity trauma and fall from height. Though it is rare, potential complications are severe. Hence orthopaedic surgeon should be good in managing this type of fractures.

Keywords: Neck of femur, paediatric, delbert

INTRODUCTION

Femoral neck fractures account for <1% of cases [1]. It results due to motor vehicular accidents or fall from height [2]. Potential severe complications make this fracture reduction utmost important. In such cases fractures to be operated <24 hrs to get better results. Here we have case which presented very late after 72 hrs which was fixed with internal fixation and to be followed up for future complications.

Blood supply in children is different from adults [3,4]. The physal plate provides the main anatomic variation in the proximal femur of children as compared to mature adults. This cartilaginous growth plate serves as a barrier to vessels, which do not cross it. An extracapsular arterial ring formed by the conjoining of branches from the medial and lateral circumflex arteries gives rise to ascending retinacular or cervical vessels that enter the proximal aspect of the hip joint capsule. These retinacular vessels ascend the femoral neck intra-articularly toward the femoral head. They are divided into four groups based upon their location on the femoral neck: lateral, posterior, medial, and anterior. As the cervical vessels continue to track proximally, they form another anastomosis at the junction of the femoral neck and the articular cartilage of the femoral head. This gives rise to an intra-articular subsynovial ring. This ring in turn gives rise to epiphyseal and metaphyseal branches which provide arterial nourishment to the most proximal portion of the femur. Between 4-7 years of age only source is lateral epiphyseal artery. After 7 years ligament of teres vessels become prominent and anastomose with lateral epiphyseal vessels.

Treatment involves non-operative and operative depending on degree of displacement. Ct scan is needed in some cases like stress or non-displaced fracture or to see comminution. Treatment modalities includes hip spica, closed reduction with percutaneous screws, open reduction with screws or paediatric DHS. According to expert single attempt of reduction to be done to prevent complications [5].

The key element of closed reduction is that gentle, sustained traction be applied in-line with the femoral neck, with the hip flexed and externally rotated to untwist and relax the spiral fibers of the hip capsule, this is Flynn manoeuvre. After reducing the fracture, the hip is internally rotated, gradually extended and abducted to maintain reduction. This tightens the spiral fibers of the capsule and "locks" the reduction [6].

Complications include AVN wherein risk increases 1.14 times for every year of increasing age [7]. It results due to kinking of vessels or tamponade by intravascular hematoma. Other complications include coxa vara, non union, physal arrest, limb length discrepancy, chondrolysis, malreduction or infection.

CASE PRESENTATION

A 7 year old girl came with left sided hip pain with history of trauma 4 days back. She had difficulty in moving left lower limb and was not able to bear weight since then. After doing x-ray patient was diagnosed having left neck of femur fracture. Patient was admitted for fracture neck of femur (Fig. 1).

On examination: Child was well nourished for her age, conscious cooperative.

Investigation: Hb 14 gm% PCV 43% Platelets count 1.5 lakh.

Viral markers negative, treatment started with analgesics, skin traction with 1kg to relieve pain and spasm. Patient was operated very next day after admission.

Fracture was reduced with single attempt of closed reduction on traction table and fixed using 2 x 4 mm cc screw with washer.

Patient was discharged after 3days and was called for stitch removal (postop day 14) and physiotherapy static quadriceps exercise and knee ROM and called for FU after 1 month. After which patient did not show up as it was difficult for them to come from Karnataka.



Fig. 1. Preoperative X-ray.

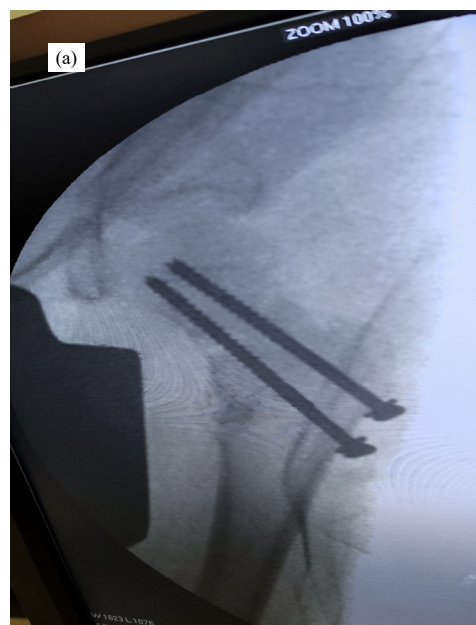


Fig. 2 a,b intraoperative c-arm X-Ray.



Fig. 3 Postoperative X-ray.

DISCUSSION

Neck of femur fracture in child needs urgent intervention. Blood supply

Table 1. Delbert classification is used to determine operative versus non operative treatment.

	Incidence	AVN
Type 1: Transepiphyseal	<10%	38%
Type 2: transcervical	40-50%	28%
Type 3: cervicotrochanteric	25-35%	18%
Type 4: intertrochanteric	6-15%	5%

of proximal femur is different from adult. Thus makes it potential to develop serious complications if not treated on time. Timing is very important < 24 hrs injury has better prognosis as compared to patient presenting late. Hip spica use in young child either with undisplaced fracture or after percutaneous screw. Always emphasized on single attempt of reduction.

Delbert classification is used to determine operative versus non operative treatment and to predicts the risk factor for AVN of the femoral head [5,8].

Ratliff has described three type of AVN after fracture. Type I has the worst prognosis and involves the entire head. Type II involves only a portion of the head and in type III, there is a zone of AVN from the fracture line until the physis (Table 1) [9].

Complications include Avascular necrosis, Nonunion, Premature physeal closure, Coxa vara, Limb length discrepancy, Chondrolysis [10].

Other causes of fracture neck of femur in child in non-accidental cases should be ruled out such as metabolic diseases, nutritional deficiency, rickets, child abuse [10].

Sometimes we may need to do MRI to diagnosed stress fracture when x-ray is not readable. Timely intervention is must.

CONCLUSION

It is a rare condition. Neck of femur fracture in child occurs following high velocity trauma and fall from height. Though it is rare, potential complications are severe. Hence orthopaedic surgeon should be good in managing this type of fractures.

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