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Case Report

A case report of Type II Salter Harris fracture displacement of distal femur

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Abstract

Physeal fractures account for 15% to 30% of all bony injuries in children. Type II Salter Harris represent the most common type of growth plate fractures characterized by fracture along the physis exiting from the metaphysis. Type II Salter Harris fractures are usually managed by closed reduction and usually must be monitored for complications such as growth arrest. The authors present an uncommon case of Salter Harris Type II fracture of the distal femur in an adolescent resulting from fall from height that was managed by open reduction and internal fixation. A 14-year-old boy was brought to the emergency with an alleged history of fall while trying to jump over a gate. He had a visible deformity on his left knee with significant swelling and intact skin. X rays confirmed the diagnosis of Type II Salter Harris fracture of the distal femur of left knee. Closed reduction was attempted twice but fracture was highly unstable. Open reduction was achieved by varus and hyperextension. Fracturel fixation was done by a medial distal femur osteotomy plate. He was on regular follow up.X-rays were taken at 6, 12, and 26 and weeks. Implant was removed 12 months from the primary injury. The functional outcome at 18 montths is excellent.

Keywords: Salter Harris Type 2 Fracture, Distal femur.

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1. Introduction

Physeal fractures account for 15% to 30% of all bony injuries in children.[1] The physis is relatively weak during a child's growth spurt compared to bone tissue. This increasing its propensity to fracture whenever exposed to high traumatic forces.[1] The Salter Harris classification system classifies fractures of the growth plate into five different categories.[2] Distal Femoral Physeal fractures are uncommon fractures in the pediatric population. The risk of complications is high due to the tremendous potential for growth at this particular physis.[3] Type II Salter Harris represent the most common type of fractures characterized by fracture along the physis into the metaphysis without crossing into the growing epiphyseal region of the bone.[4] These fractures are usually managed by closed reduction and must be monitored for complications such as growth arrest. The authors present an uncommon case of Type II Salter Harris fracture of the distal femur in an adolescent resulting from fall that was managed by open reduction and internal fixation.

2. Case Report

A 14-year-old boy was brought by his parents to the emergency with complaints of pain, swelling and inability to move his left knee. He had an alleged history of fall from about 8 feet height while trying to jump over a high gate. On examination, he was about 6 feet 3 inches tall and weighed about 105 kg. He had a visible deformity on his left knee, the skin was intact with significant swelling. The distal neurovascular status was intact. Radiological examination (X ray Left knee – AP and Lateral view) confirmed the diagnosis of Type II Salter Harris fracture displacement of the distal femur.(**Figure 1**).

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Figure 1: X ray of the knee (AP and Lateral view) showing Type II Salter Harris fracture of distal femur with the metaphyseal beak lateral.

After informed consent from parents and assent from patient, he was taken for surgery under general anesthesia, The patient was kept in supine position. Examination under image intensifier confirmed the fracture pattern. Closed reduction was attempted twice. The reduction was incomplete and the fracture was highly unstable. Hence it was decided to proceed with open reduction. The left lower limb was painted and draped. Tourniquet inflated. Surface markings were done. An anteromedial 7-10 cm skin incision given over anterior aspect of left knee. Vastus medialis was torn with buttonholing of the proximal fragment through it. The distal fracture fragment was found to be lateral and posterior with intact periosteum over the posterior cortex. Reduction was achieved by varus and hyperextension. The reduction was held by two, 2 mm K wires Fracture fixation was done by a medial distal femur osteotomy plate placed over anteromedial aspect of distal femur. C-arm images were taken to ensure that no screw cross the growth plate. . Thorough wash given and wound was closed in layers. Implant used was Synthes- Tomofix (Medial distal femur osteotomy plate). Post-operative X-rays of left knee was show a well reduced and stable distal femur fracture. (**Figure 2**).

The post-operative period was uneventful. Toe touch weight bearing as per pain tolerance with walker assisted ambulation doe from the first day for toilet privileges. He was discharged two days post-surgery. Follow up x rays were taken at 6, 12, and 26 weeks. Patient concerns, presence of deformity, limb length assessment and status of bone union was assessed at every follow up visit. Six month follow up x rays revealed complete bony union, absence of any deformity with full knee range of motion. The patient complained of hardware prominence with no functional difficulty. The implant was removed at 12 months from the primary injury (**Figure 3**). Functional outcome (Lower Extremity Functional Score) was excellent at 18 months from injury.

Figure 2: X rays of Knee (AP and Lateral view) showing post operative plate fixation

Figure 3: X ray Knee (AP and Lateral view) showing post removal status with no deformity.

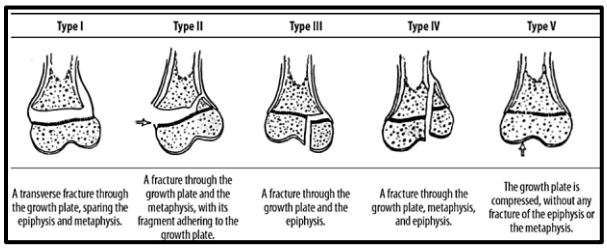

Figure 4; Salter-Harris Classification (from "Caffeys pediatric diagnostic imaging," Mosby Elsevier, 2007

3. Discussion

The Salter Harris classification is a valuable tool for understanding and describing fractures about the growth plate (**Figure 4).** Type II Salter Harris fractures are the most common type of growth plate injury. Type II fractures constitute about 75% of the injuries in paediatric age group. In the distal femur the risk of growth alterations in Type II injuries is almost 58%.[5-6] Higher levels of displacement of the fracture fragments are associated with increased incidence of complications. The most common complication in distal femur growth plate injury is limb length discrepancy or angular deformity which results from physeal arrest. Hence it becomes very important to counsel the parents regarding the poor prognosis associated with this fracture pattern. Mismatch of the medial locking plate with the distal femur made the plate edge prominent. The parents were counselled about this prominence and the necessicity of the hardware removal.

4. Source of Funding

None.

5. Conflict of Interest

None.

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