

Pseudo-Acetabulum due to Heterotopic Ossification in a Child with Post Traumatic Neglected Posterior Hip Dislocation

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What to Learn from this Article?

*A very unusual radiological appearance of pseudo-acetabulum by bone formed by heterotopic ossification
Surgical management of neglected hip dislocation with heterotopic ossification*

Abstract

Introduction: Traumatic neglected dislocations of hip in children are rare entity. Neglected traumatic dislocations of hip in children along with heterotopic ossification are still rare. Post traumatic neglected hip dislocations are to be diagnosed as early as possible and have to be treated with precision and aggression as the outcome of treatment for the same is not predictable.

Case Report: 5 year female with post-traumatic neglected hip dislocation with heterotopic ossification forming a pseudoacetabulum postero-superiorly in which femur head was lodged. The girl was operated by open reduction using Moore's Posterior approach and showed good results. Here is a mention of a rare case with a good 18 months follow up with no complication.

Conclusions: Post-traumatic neglected posterior hip dislocation mostly requires open reduction and relocation of femoral head in original acetabulum with concentric reduction. Heterotopic ossification is a rare but known complication of traumatic dislocation of hip in children. Good results can be achieved in such cases and regular follow-up of patient is required post-operatively.

Keywords: Neglected Post-traumatic, hip dislocation, heterotopic ossification.

Introduction

Traumatic dislocation of hip in children is a rare entity accounting for less than 5% of pediatric dislocation and neglected post traumatic dislocation of hip is much more rare [1,2]. Of them posterior dislocation of hip is more common than anterior[1,2]. The character of injury tends to vary, in that children under the age of 6 years suffer isolated hip dislocation due to low energy trauma, whereas older children require high energy trauma[1,2]. Most of the dislocation of hip in children can be reduced easily but delay in reduction of hip of more than 6 hours are

associated with poor outcome because as the time interval between dislocation and reduction increases, incidence of complications like avascular necrosis of femoral head, redislocation, heterotopic ossification and chondrolysis [3]. There have been very few cases of post-traumatic neglected posterior dislocation of hip [4] (Table 1). Heterotopic ossification in neglected post traumatic posterior dislocation in children is known but devastating and a very rare occurrence [4]. We report one such case

Case History

A 5 year female child resident of a village in Uttar Pradesh

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Figure 1: Pre-operative antero-posterior radiograph of patient showing posterior dislocation of hip with heterotopic ossification postero-supero-laterally forming pseudo-acetabulum.

presented with history of fall from height in school after which she was unable to walk due to pain in left hip region. The patient was taken to local quack where she was treated with massaging and wooden splintage around left hip region for 2-3 weeks and was kept on bed rest. After removal of splintage patient was unable to bear weight on left lower limb due to pain. The patient was brought 4 months post trauma to our hospital for treatment.

On clinical examination patient had findings suggestive of posterior dislocation of femoral head. She also had true and apparent shortening of 4 centimetres. Range of motion at left hip was painful and restricted, associated with muscle spasms so under normal condition telescoping couldn't be illustrated but it was found to be positive under anaesthesia. Examination of opposite hip, spine and both knees was normal. X-ray showed posterior dislocation of hip with heterotopic ossification postero-supero-laterally forming pseudo-acetabulum (Fig. 1 & 2). There was no evidence of acetabular fracture or femoral head/neck fracture. Same findings were confirmed on C.T. scan (Fig.

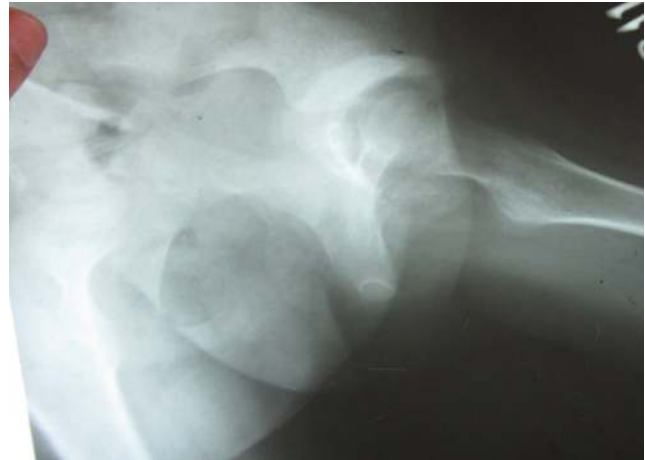


Figure 2: Pre-operative lateral radiograph of patient. Crescent Shaped Heterotopic ossification is seen forming pseudoacetabulum

3 & 4). All lab investigations were within normal limits including serum calcium, phosphorous and alkaline phosphatase.

Patient was kept on skeletal traction for 3 weeks with weight of 3 kilogram. X-rays taken after 3 weeks of traction revealed no descent of femoral head or any other change. The patient was operated by Moore's southern approach open reduction of dislocated hip after removing the fibrosis in original acetabulum and clearing it, releasing the capsule. Heterotopic mass was excised and head was reduced in original acetabulum followed by capsulorrhaphy. Intra operatively reduction was checked and was stable, congruent and concentric through all range of motions of hip. Under C-arm guidance head was fixed to acetabulum with a single K wire of 1.6 mm (0.062 inch) as a precautionary measure in view of non compliance of patient and parents (Figure 5). Post operatively child was kept in hip spica for 8 weeks and course of indomethacin was given for 3 weeks [5]. Patients post operative status was uneventful. Spica cast was



Fig 3: CT scan of the patient showing posterior dislocation of hip with heterotopic ossification postero-supero-laterally forming pseudo-acetabulum (Antero-posterior view).



Fig 4: 3 D reconstruction image of the hip (femur subtraction) demonstrating heterotrophic ossification mass surrounding the hip (postero-lateral aspect)



Figure 5: a- Immediate post-operative antero-posterior view of patient showing reduced hip dislocation with a transfixing k-wire through hip joint. Note the excised ossification mass not visible on radiograph. b- 6 weeks post surgery with K wire removed

changed at end of 3 weeks under anaesthesia. K wire was removed at 6 weeks along with spica cast (Fig. 5). On examination after removal K wire and spica cast under C-arm congruency of reduction and stability of femoral head was checked through out the range of motion of hip. Thereafter gradual mobilisation of hip was started. The patient was kept on nil weight bearing for 1 month, followed by partial weight bearing for 3 weeks and then full weight bearing. Histopathology report of excised mass forming pseudo-acetabulum revealed as mature bone suggestive of heterotopic ossification. Currently 18 months post surgery patient is able to walk full weight bearing with full range of motion of left hip and no limb length discrepancy (Fig. 6). The patient is also able to squat and run with no X-ray or clinical evidence of avascular necrosis of femoral head (Fig. 6). Patients entire heterotopic mass was removed and throughout our follow-up 18 months there were no evidence of reappearance of the same.

Discussion

Post traumatic hip dislocation in children is a rare entity and its neglected type is much rarer as stated by Kumar et al [6]. We have made a table of all the case series of "Neglected Post-traumatic dislocation of hip in children" searched from pubmed and google from the available literature (Table 1). This table clearly shows that the results vary and are not predictable and such occurrences are indeed rare. Traumatic posterior dislocation are more common than anterior type [1,2]. Post-traumatic dislocation of hip are to be treated as early as possible and best results are obtained by doing closed reduction within 6 hours of trauma [3]. In neglected post traumatic

Figure 6: AP Lateral radiograph of patient after 18 months showing reduced hip joint with no other abnormality. There was no recurrence of Heterotopic ossification mass

dislocation of hip in children no fixed time interval can be framed within which surgery is advised. Our case further adds to case series of Banskota et al [7] confirming that good prognosis in such neglected cases in children can be achieved by open reduction. . . Heterotopic ossification around hip in children without any associated acetabular or proximal femur fracture in post-traumatic neglected dislocation of hip is very rare [1,2]. Its common sites around hip are anterior capsule, proximal femur, behind belly of iliopsoas and posterior capsule. Heterotopic ossification can result after closed reduction of hip in children [1,2]. Preoperative extent of heterotopic ossification has previously been suggested as being the main risk factor for recurrence after excision [8,9]. Some studies defer from this statement too [10]. Heterotopic ossification is more common in patients of all ages with head injury and spinal cord trauma as they are often associated with bone fracture, sepsis, prolonged immobilization, neurovegetative disorders, etc [10,11]. It is much common post surgery by anterior approach in all age group and post arthroplasty by any approach in adults [9]. Early surgical intervention minimises the development of intra-articular pathology, osteoporosis and the resultant complications without increasing the risk of recurrence of heterotopic ossification [12]. In study by Mehlmann et al, 3 children out of 42 had developed heterotopic ossification and required excision [3]. Thus heterotopic ossification is a known complication. Very few cases reporting such heterotopic ossification forming pseudo-acetabulum have been mentioned in literature [13] and we could find none associated with neglected post-traumatic dislocation. According to Odak et al [13] such pattern of heterotopic ossification suggests



Fig 9-10: Clinical photos of patient demonstrating patient Standing, squatting comfortable with free flexion, abduction and adduction at hip joint.

chronic instability or dislocation of hip and it may be symptomatic or asymptomatic as patient might walk with limp even in presence of dislocation. Our study showed that though heterotopic ossification was Booker IV type, post excision it did not recur and yielded good functional results at end of follow-up. Since this unusual form of heterotopic ossification have been encountered in few

cases and has no terminology to denote it, we would like to name it as “ Pseudo-Heterotopic Acetabulum Phenomenon (PHAP)”.

Neglected post traumatic hip dislocation in children do not respond well to conservative line of treatment but good results are evident with appropriate surgical treatment even with posterior approach with concentric reduction of femoral head with no evidence of avascular necrosis or instability as seen in table 1. In our case too a longer follow up will be needed to see evidence of these complications but early good results are encouraging

Clinical Message

Pseudoacetabulum formation due to heterotopic ossification is a rare occurrence in neglected hip dislocation in children. Good results can be expected with excision of the ossification mass and open reduction.

Conclusion

Heterotopic ossification in shape of a pseudoacetabulum in cases of neglected hip dislocations

Table 1: Literature review of Case Series of Post Traumatic Neglected Hip Dislocation in Children.

Authors	No of cases	Mean Age	Details
Terje Terjesen & Vera Halvorsen (2007)	60	20 (4 –65) Months	Neglected posterior dislocation of hip. Closed reduction in all hips except 4 that needed open reduction. 63% had good outcome and 14% had AVN at mean follow up of 26 (15-42 years)
Sudhir Kumar & Anil K Jain (1999)	12	7.5 (95-10)years	Neglected posterior dislocation of hip with delay of 20 (6-52) weeks. 1 child had radiographic evidence of myositis ossificans. Open reduction was done for all cases with excellent to good outcome at 26 (24-36) months follow up
Sudhir Kumar & Anil K Jain (2005)	18	4-10 years	As neglected posterior dislocation of hip with delay in diagnosis of 16 (6 – 52) weeks. Open reduction was done in all cases with 17 excellent and 1 good result at 26 (24-36) months of follow up
Bunnel & Webster. (1980)	1	5 years	As neglected posterior dislocation of hip at 5 weeks post injury. Closed reduction was achieved by gradual traction followed by spica cast with good results at 40 months follow up
V S Pai. (1992)	29)	29 (3-64) years.	As neglected dislocation of hip with delay of 3 to 12 months. 3 anterior dislocations and 26 posterior. 7 patients were given shoe raise, 3 closed reduced and rest open reduced. All had satisfactory outcome except 1 with excision arthroplasty
BP Varma (1975)	29	2-12 years	Neglected posterior dislocation of hip at mean delay of 2 weeks to 6 years. 25 patients underwent closed reduction, 21 of them required subsequent open reduction. 6 developed perthe s changes. Good to fair result was noted for open reduction and poor result for closed reduction at 5.1 months
V S P ai & B Kumar. (1990)	8	11.6(3-30 years).	Neglected posterior dislocation of hip with 3 days to 1 year delay. All underwent closed reduction with gradual traction. 2 required subsequent open reduction. Good results were noted at 3.5 years follow up.
Banskota, Speigel et al (2007)	8	7.5(2-16) years	Presented as neglected posterior dislocation. Initially all were treated with closed reduction and 4 required open reduction. Results were good in 3, fair to poor in remaining 5 at 7.7 years follow up
Aguilar, Julyn (2006)	14	6 years	As neglected posterior dislocation of hip with delay of 5 months. Treated with initial gradual skeletal traction with subsequent open reduction. 13 showed excellent result with 1 AVN at 4 years follow up

are not reported. Open reduction with excision of these “Pseudo-Heterotopic Acetabulum Phenomenon” can give good results even in these neglected cases. More studies and evaluation regarding the same is necessary.

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