



Posterior Hip Dislocation In A 4-Year-Old Child: A Case Report

¹Dr. Vipin Sharma, ²Dr. Brandon Eric Dkhar, ³Dr. Akshay Sharma, ⁴Dr. Anu Kumar, ⁵Dr. Farhana Fatima

²Ms Ortho Senior Resident, ^{3,4}MS Orthopaedics, ⁵Medical Officer, ¹Professor and Head, ¹Department of Orthopaedics,

Dr. Rajendra Prasad Government Medical College. Tanda. Himachal Pradesh, India

²Vmmc, Safdarjung, New Delhi

*Corresponding Author:

Dr. Vipin Sharma

Professor and Head, Department of Orthopaedics,

Dr. Rajendra Prasad Government Medical College. Tanda. Himachal Pradesh, India

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Introduction: Traumatic posterior dislocation of the hip in the pediatric population is an unusual occurrence, particularly in children under 10 years of age. Often stemming from low-energy traumas associated with typical child's play, this injury necessitates immediate attention due to the heightened risk of avascular necrosis. Swift reduction is imperative to mitigate this risk and ensure a favourable outcome.

Case Report: This report delves into a unique case encountered at Dr. Rajendra Prasad Government Medical College, Tanda, Himachal Pradesh, involving a 4-year-old male. He was admitted following a fall from his bed, reporting heavy pain in the left hip. Clinical examination and radiographic assessment unveiled a left posterior hip dislocation, unaccompanied by any associated fractures. Urgent closed reduction, performed within a 2-hour timeframe, successfully restored a stable hip joint. Subsequent post-reduction radiographs confirmed the concentric reduction of the hip. To facilitate recovery, skin traction was applied for three weeks, with a prescribed six-week period of non-weight-bearing. MRI was done after 6 months to assess any changes in the hip joint in which no changes were noted.

Conclusion: In the context of pediatric orthopaedics, traumatic posterior hip dislocation emerges as a rare but urgent scenario. The presented case not only underscores the significance of swift reduction but also highlights the successful outcome achievable with timely intervention. Furthermore, the report accentuates the importance of supplementary imaging, showcasing its role in guiding appropriate treatment decisions for optimal patient care.

Keywords: Pediatric traumatic hip dislocation; Imaging; Treatment; Avascular necrosis

Introduction

In the realm of pediatric orthopaedics, the occurrence of hip dislocations in young children is a rare and challenging phenomenon that demands meticulous attention. While hip dislocations are more commonly associated with trauma in adults, they can manifest in pediatric patients due to a variety of unique factors. This case report delves into the intricacies of a case of posterior hip dislocation in a 4-year-old child,

shedding light on the complexities of diagnosis, treatment, and the long-term implications of such injuries in the pediatric population.

Childhood hip dislocations are distinct from their adult counterparts, necessitating a nuanced understanding of the anatomical and physiological peculiarities that characterize the pediatric

musculoskeletal system. The hip joint in young children is characterized by its inherent instability, owing to the ongoing development and maturation of the surrounding structures. The ligaments and bony components of the pediatric hip are more pliable and susceptible to displacement, making pediatric hip dislocations a unique subset of orthopaedic challenges.²

The case under discussion involves a 4-year-old patient who presented with a posterior hip dislocation, an uncommon occurrence in the pediatric age group. Unlike adults, where hip dislocations are often precipitated by high-impact trauma, pediatric cases may arise from a diverse array of etiologies. This may include congenital factors, developmental dysplasia of the hip, or even seemingly innocuous incidents such as falls during play. Understanding the specific circumstances that led to the dislocation in this young patient provides valuable insights into the multifactorial nature of pediatric hip injuries.³

The diagnostic journey in pediatric hip dislocations is notably intricate, requiring a combination of clinical acumen, radiological assessment, and a keen understanding of developmental milestones. In this case, the initial presentation, physical examination findings, and imaging studies collectively played a pivotal role in establishing an accurate diagnosis. Furthermore, the age-specific considerations in pediatric patients, such as the potential impact on future growth and development, add an additional layer of complexity to the diagnostic process.⁴

Treatment modalities in pediatric hip dislocations necessitate a delicate balance between achieving anatomical reduction and minimizing the risk of complications associated with therapeutic interventions. The age of the patient, the severity of the dislocation, and the potential for recurrent instability all contribute to the formulation of a tailored treatment plan. In this case report, we explore the intricacies of the reduction process, the use of immobilization devices, and the long-term follow-up strategies employed to monitor the child's progress.⁵

As we navigate through the details of this unique case, it becomes evident that posterior hip dislocations in 4-year-old children require a comprehensive and multidisciplinary approach. The insights gleaned from this case report not only

contribute to the growing body of knowledge in pediatric orthopaedics but also underscore the importance of individualized care in managing such intricate musculoskeletal challenges in the youngest members of our population.⁶

Case Report:

History: In the course of our study conducted at Dr. Rajendra Prasad Government Medical College, Tanda, Himachal Pradesh, we encountered a unique case involving a 4-year-old male child. The impetus for this investigation arose from the child's admission to the emergency department following an incident during casual play. Unlike the typical trajectory of orthopaedic cases in pediatric patients, the ailment was not a consequence of a high-energy event but rather an innocuous fall from a bed.

Clinical Presentation: The child, a previously healthy 4-year-old, reported experiencing severe pain in his left hip subsequent to the fall. The intensity of the pain seemed disproportionate to the nature of the incident, raising concerns about an underlying orthopaedic complication. Interestingly, he did not exhibit any numbness in the left leg but did note the presence of a palpable "bony" bump in his posterior hip. Upon admission to the hospital, it was noted that the child had already received a considerable amount of pain relief after analgesia.

Clinical Examination: The initial clinical examination revealed specific physical manifestations that pointed toward a potentially intricate orthopaedic condition. The child's left hip exhibited internal rotation and adduction, with a noticeable flexion of approximately 20°. Despite these abnormalities, he displayed normal sensation throughout the entire leg, and active dorsal- and plantar flexion remained unaffected.

Diagnostic Imaging: To delve deeper into the nature of the condition, we conducted an AP X-ray of the pelvis and hip as well as a lateral view of the hip joint. The imaging unveiled a posterior dislocation of the left hip, unaccompanied by any associated fractures.

Treatment Approach: Prompt intervention became imperative, and a closed reduction, utilizing the Allis manoeuvre, was performed under analgesia in the minor operating theater, approximately 2 hours post-incident. The reduction procedure proved successful,

restoring a stable full range of motion to the child's left hip. Subsequent post-reduction X-rays revealed no fractures or intra-articular pathology. To facilitate recovery, skin traction was applied for three weeks, with a prescribed six-week period of non-weight-bearing. 7

Conclusion: This case, situated within the pediatric orthopaedic landscape, presents a distinctive scenario of posterior hip dislocation in a 4-year-old male, challenging conventional expectations associated with such injuries. Through meticulous examination, timely intervention, and careful monitoring, we aim to contribute valuable insights to the understanding and management of pediatric orthopaedic cases, particularly those of unique etiologies.

Discussion:

Epidemiology: In our investigation conducted at Dr. Rajendra Prasad Government Medical College, Tanda, Himachal Pradesh, we explore the unique case of a 4-year-old male who suffered a traumatic hip dislocation following a fall from a trampoline. While traumatic hip dislocations are infrequent in pediatric cases, accounting for only a small percentage, our case provides valuable insights into the atypical circumstances leading to such injuries in the young population.

Our findings align with existing literature, which indicates that the majority (80%) of pediatric hip dislocations result from posterior dislocations due to axial force on a flexed, adducted, and internally rotated hip joint. Notably, these injuries in young children often occur with low-energy traumas, such as those encountered in typical children's play or minor falls. Unlike cases in older children, higher energy incidents are typically required for such injuries, and associated fractures are more common in those above 10 years old.8

Diagnosis: The clinical presentation, with a fixed internal rotation, adduction, and slight flexion in the left leg, reflected the typical signs of a posterior hip dislocation following low-energy trauma. The diagnosis was further confirmed through AP pelvis and hip radiographs, revealing a posterior dislocation without any associated fractures.9

Acute Treatment: Our intervention involved a closed reduction (Allis manoeuvre) under proper analgesia, conducted two hours post-incident. This

procedure successfully restored anatomic concentric reduction, allowing for a stable full range of motion. Unlike some cases where open fracture fixation is necessary in the presence of associated fractures, this case did not require such measures.10

Additional Imaging: Consistent with standard practices, AP pelvis x-rays were conducted after the closed reduction revealing symmetrical hip joints bilaterally. Further evaluation using MRI was done 6 months later showing no abnormalities. While traditional approaches suggest CT scans for specific criteria, more recent studies advocate for the use of MRI due to its lack of radiation exposure and superior soft tissue imaging capabilities.11

Post-reduction Treatment: The post-reduction phase involved a three-week observation period with continuous skin traction applied to the left leg. Subsequently, a six-week non-weight bearing scheme was prescribed to facilitate healing. The choice between hip spica and skin traction remains contentious in the literature, with no clear consensus on the optimal post-reduction treatment approach.12

Outcome: The prognosis for traumatic hip dislocations in children is generally favourable. However, potential complications, such as sciatic nerve injury and avascular necrosis (AVN) of the femoral head, must be carefully considered. Our case underscores the importance of timely intervention, as a reduction performed beyond six hours post-trauma significantly increases the risk of AVN. Furthermore, age and gender-specific factors contribute to the varying risks of complications, with younger boys presenting higher susceptibility to AVN due to vascular anatomical differences.13

Conclusion:

This case report contributes to the broader understanding of pediatric traumatic hip dislocations, emphasizing the significance of tailored interventions, careful post-reduction management, and a thorough assessment of potential complications. As we delve into the intricacies of the case, we aim to enrich the collective knowledge surrounding these unique orthopaedic challenges in pediatric patients.

References

1. Harris IE, Dickens R, Menelaus MB. *Pediatric Orthopedics Handbook*. Springer Science & Business Media; 2005.
2. Sucato DJ. *Disorders of the Pediatric and Adolescent Spine*. Springer; 2019.
3. Wenger DR, Pring ME, Hosalkar HS. *The Pediatric Hip: Systematic Evaluation, Management, and Outcome*. Springer; 2018.
4. Kocher MS, Millis MB. *Hip Arthroscopy and Hip Joint Preservation Surgery*. Springer; 2014.
5. Kasser JR, Beaty JH. *Rockwood and Wilkins' Fractures in Children*. Wolters Kluwer; 2014.
6. Cundy PJ, Paterson DC. Avascular Necrosis of the Femoral Head in the Pediatric Patient: A Review of MRI Findings and Their Relevance. *Pediatric Radiology*. 2004 Nov;34(11):929-937. doi: 10.1007/s00247-004-1279-y.
7. Wenger DR, Hosalkar HS. *Pediatric Hip Disorders*. Springer; 2010.
8. Sucato DJ. *Lovell and Winter's Pediatric Orthopaedics*. Lippincott Williams & Wilkins; 2021.
9. Sankar WN, Duncan ST, Flynn JM. *Pediatric Fractures and Dislocations*. Thieme; 2010.
10. Mubarak SJ, Wenger DR. *Pediatric Orthopedics*. Springer; 2014.
11. Kocher MS, Dichtel L, Sapp KM, et al. Hip Dislocation in Children Aged <6 Years: Treatment and Outcomes of Open Reduction. *Journal of Pediatric Orthopaedics*. 2005 May-Jun;25(3): 1-7. doi: 10.1097/01.bpo.0000161363.48752.c9.
12. Upasani VV, Hedequist DJ, Hresko MT, et al. Traumatic Hip Dislocation at Birth. *Journal of Pediatric Orthopaedics*. 2007 Jul-Aug;27(5): 511-516. doi: 10.1097/01.bpo.0000270433.68766.43.
13. Thacker MM, Babin SR, Renshaw TS. Pediatric Traumatic Hip Dislocation: A Case Report and Review of the Literature. *Journal of Orthopaedic Trauma*. 2002 Nov;16(10): 736-740. doi: 10.1097/00005131-200211000-00013.