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Case report

ISOLATED CONGENITAL KNEE DISLOCATION: A CASE REPORT

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Abstract: **Introduction:** Congenital knee dislocation is a rare orthopedic condition characterized by abnormal positioning of the knee joint at birth, with an estimated incidence of approximately 1 in 100,000 live births. It is often associated with other congenital anomalies, necessitating prompt diagnosis and management.

Case Report: A male neonate delivered via cesarean section was referred for orthopedic evaluation due to a left lower extremity deformity. Initial examination revealed left knee hyperextension of approximately -45 degrees and restricted passive flexion limited to 90 degrees. Neurovascular assessment was normal. Radiographic imaging confirmed hyperextension without additional skeletal deformities. The treatment plan involved above-knee cast immobilization in maximal flexion, changed weekly for six weeks. By the end of the immobilization period, the patient exhibited significant improvement, achieving a full passive range of knee flexion and extension. Follow-up two weeks later confirmed normal passive and active ranges of motion, with no residual impairment.

Conclusion: Early intervention in congenital knee dislocation is crucial for achieving favorable functional outcomes, emphasizing the effectiveness of non-operative strategies in neonates.

Keywords: Knee dislocation, Congenital abnormalities, Conservative treatment, Neonatal orthopedics.

INTRODUCTION

Congenital knee dislocation (CKD) is a rare condition characterized by abnormal positioning of the knee joint at birth, with an estimated incidence of approximately 1 in 100,000 live births (1). It is frequently associated with other congenital anomalies, such as hip dislocation and clubfoot, with studies indicating that 60-88% of patients with CKD present with additional musculoskeletal abnormalities (2, 3, 4). The etiology of CKD is largely idiopathic; however, it has been associated with various factors, including muscle imbalance, ligamentous laxity, and other congenital abnormalities of lower extremities (2, 5). Diagnosis is typically made after physical examination and imaging studies, including X-rays, which reveal characteristic features such as anterior tibial translocation on the femur and hyperextension of the knee joint (1).

Management typically involves non-operative techniques such as closed reduction and immobilization, which have shown success in restoring normal knee function when initiated promptly (5, 6). Early intervention is crucial, as delayed treatment can lead to more complex surgical requirements and poorer functional outcomes (2, 3, 4). Therefore, while isolated congenital knee dislocation is uncommon, its implications for pediatric orthopedic practice are significant, necessitating awareness and appropriate management strategies.

CASE REPORT

A male neonate was delivered via cesarean section and referred for orthopedic evaluation on the same day due to a left lower extremity deformity. Upon initial examination, the left knee was hyperextended at an angle of approximately -45 degrees, with passive flexion restricted to 90 degrees (Figure 1). The neurovascular status of the limb was assessed and found to be normal.

Radiographic imaging was performed, and X-rays confirmed hyperextension of the knee; however, no additional skeletal deformities were identified (Figure 2).

Based on the clinical findings and imaging results, the patient was diagnosed with isolated congenital knee dislocation. The initial treatment plan involved above-knee cast immobilization, with the knee positioned in

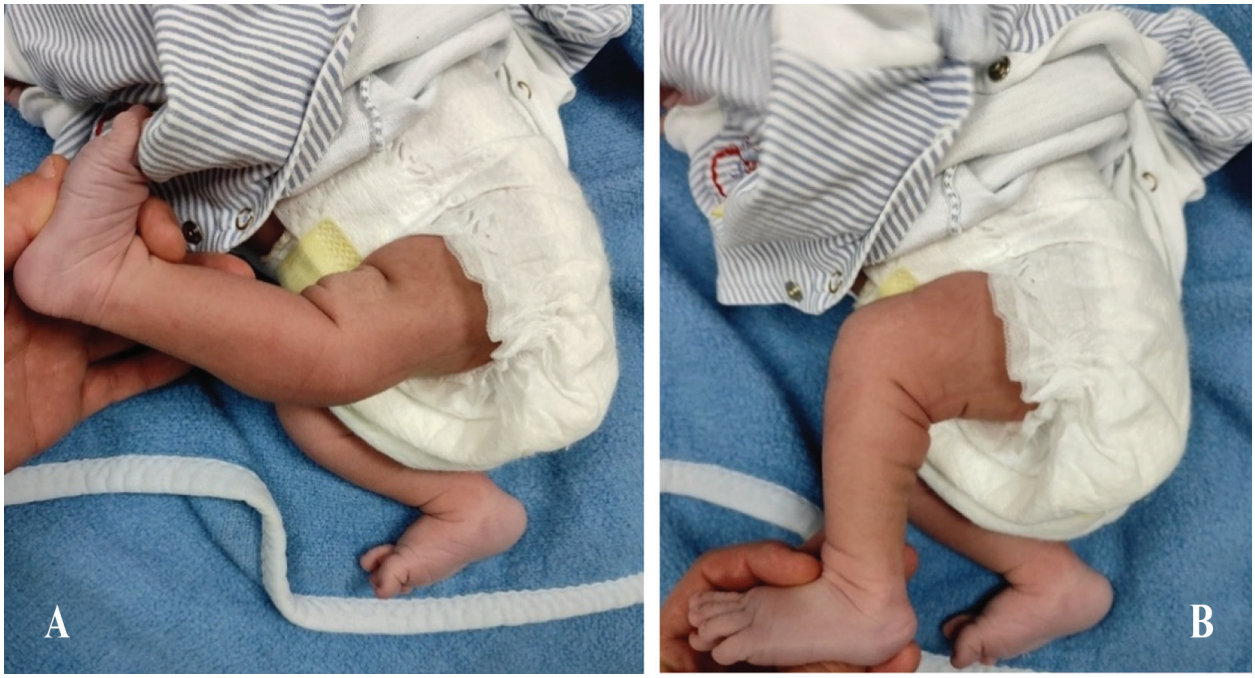

Figure 1. *Clinical images on the day of birth A. – Knee in maximal extension and B – knee in maximal flexion (from authors' archive)*

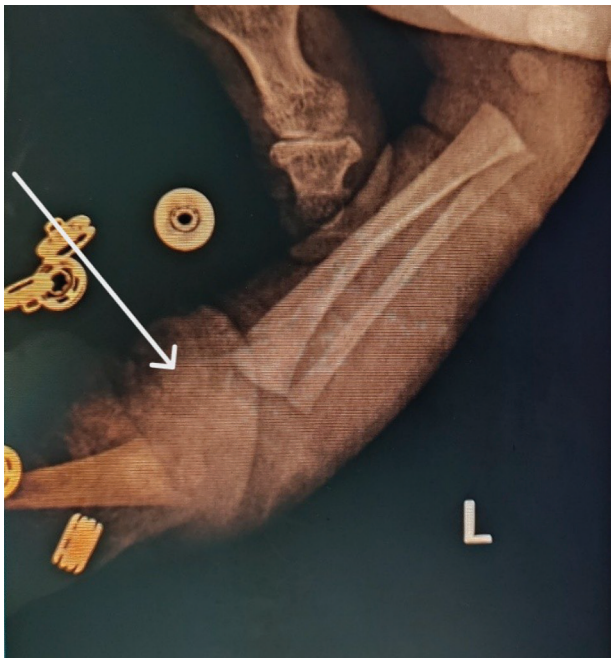

Figure 2. *X-rays of the knee in maximal passive extension show hyperextension of the knee joint (from authors' archive)*

Figure 3. *Above-knee cast immobilization in maximal flexion placed after the examination (from authors' archive)*

maximal flexion to promote proper alignment and facilitate correction of the dislocation (Figure 3).

The cast was changed weekly for a period of six weeks. During each follow-up examination, the cast was removed, and a regimen of passive range of motion exercises was implemented. Specifically, passive flexion and extension exercises were performed for a duration of five minutes before reapplying a new above-knee cast in maximal flexion. This approach aimed to enhance joint mobility while maintaining the necessary immobilization to correct the dislocation.

At the conclusion of the six-week immobilization period, the cast was removed, revealing a significant improvement in the knee's range of motion. The patient demonstrated full passive range of knee flexion with a loss of 10 degrees in passive knee extension

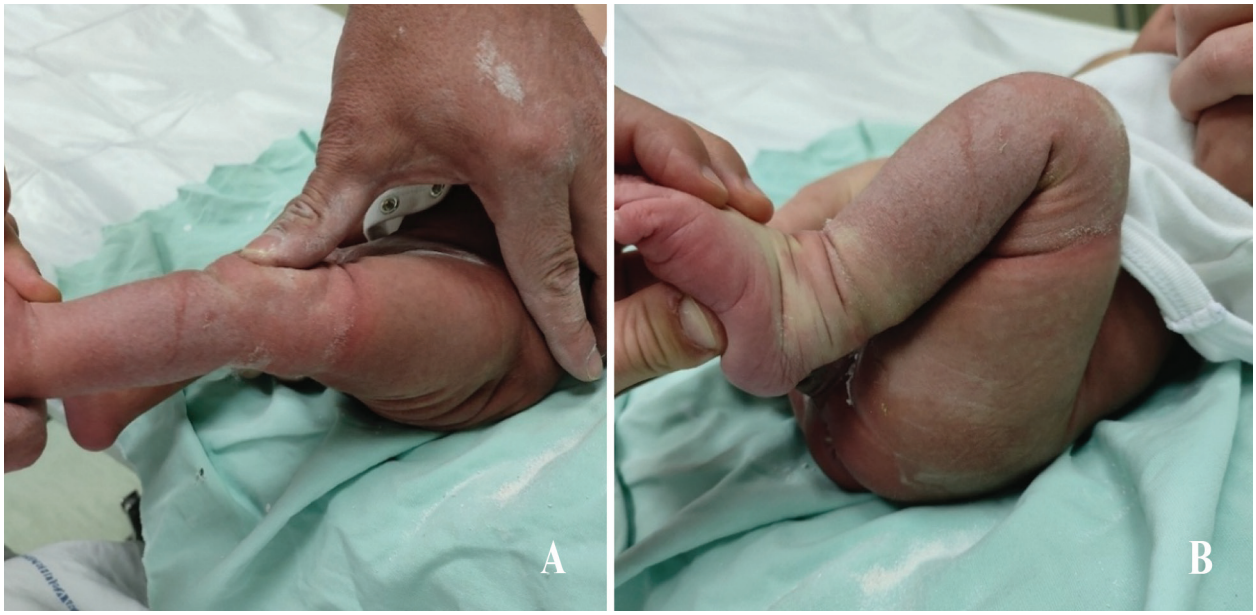

Figure 4. *Images at the end of 6 weeks of treatment A. – Knee in maximal extension and B – knee in maximal flexion (from authors' archive)*

(Figure 4). Following this examination, the parents were instructed to continue passive range of motion exercises several times per day to further promote joint function and prevent stiffness.

A follow-up examination conducted two weeks after the cast removal revealed that both passive and active ranges of motion had normalized, confirming the successful management of the congenital knee dislocation.

DISCUSSION

Congenital knee dislocation (CKD) is a rare condition that poses significant challenges in both diagnosis and management. The estimated incidence of CKD is approximately 1 in 100,000 live births, making it less common than other congenital musculoskeletal disorders, such as developmental dysplasia of the hip (1). In our case, the male neonate presented with a left knee hyperextension deformity, which was promptly identified and managed through conservative measures. This aligns with current literature that emphasizes the importance of early intervention in improving functional outcomes and preventing complications associated with delayed treatment (5-9).

The association of CKD with other congenital anomalies is well-documented, with studies indicating that 60-88% of patients with CKD may present with additional musculoskeletal abnormalities, including congenital hip dislocation and clubfoot (3, 4). In our case, the absence of additional skeletal deformities is noteworthy, as it suggests a more isolated presentation of CKD. The literature highlights that the presence of concomitant deformities often necessitates a more comprehensive treatment approach, including the need for surgical intervention in more complex cases (5, 6, 10).

The etiology of CKD remains largely idiopathic, although it has been associated with factors such as muscle imbalance, ligamentous laxity, and anatomical abnormalities (2, 3). In our patient, the hyperextension of the knee and limited passive flexion were indicative of a structural deformity that required intervention. The treatment protocol employed, which involved above-knee cast immobilization in maximal flexion, is consistent with recommended practices for managing CKD. This approach has been shown to be effective in restoring knee function when initiated early (5, 6, 10).

At the conclusion of the six-week immobilization period, the patient exhibited significant improvement in the range of motion. This outcome is consistent with findings from other studies that report successful restoration of knee function through conservative management (4, 6, 11). However, it is important to note that not all cases of CKD respond favorably to non-operative treatment. The classification of CKD into types based on reducibility and stability can influence treatment strategies and outcomes (3, 4, 12). In cases where the dislocation is irreducible or associated with significant instability, surgical intervention may be warranted to achieve optimal results (2, 6).

CONCLUSION

In conclusion, this case underscores the importance of early recognition and appropriate management of congenital knee dislocation (CKD). The suc-

cessful outcome achieved through conservative treatment highlights the potential of non-operative strategies to restore knee function in neonates with CKD. Future research should focus on refining classification systems and treatment protocols to optimize outcomes for patients with CKD, particularly those with associated congenital anomalies.

Abbreviations

CKD - Congenital knee dislocation

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Informed Consent Statement: Written informed consent was obtained from the patient´s parents for the publication of this case report.

Data Availability Statement: All data generated or analyzed for this report are included in the published article.

NOTE: Artificial intelligence was not used as a tool in this study.

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Sažetak

IZOLOVANA KONGENITALNA DISLOKACIJA KOLENA: PRIKAZ SLUČAJA

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Uvod: Kongenitalna dislokacija kolena je retko ortopedsko stanje koje karakteriše abnormalan položaj zgloba kolena pri rođenju, s procenjenom incidencom od 1 na 100 000 živorođene dece. Često se povezuje s drugim kongenitalnim anomalijama, što zahteva brzu dijagnozu i lečenje.

Prikaz slučaja: Muško novorođenče rođeno carskim rezom upućeno je na pregled ortopeda zbog deformiteta levog donjeg ekstremiteta. Početni pregled otkrio je hiperekstenziju levog kolena do približno -45 stepeni i ograničenu pasivnu fleksiju do 90 stepeni. Neurovaskularni status je bio normalan. Radiografski snimak potvrdio je hiperekstenziju kolena bez dodatnih deformiteta skeleta. Plan lečenja je uključivao natkolenu gipsanu imobilizaciju u maksimalnoj fleksiji, koja se menjala sedmično tokom šest sedmica. Na kraju perioda imobilizacije, pacijent je imao značajno poboljšanje lokalnog nalaza, puni opseg pasivne fleksije i ekstenzije kolena. Kontrolni pregled dve sedmice kasnije potvrdio je normalan pasivni i aktivni raspon pokreta, bez zaostalog deformiteta.

Zaključak: Rana intervencija kod kongenitalne dislokacije kolena ključna je za postizanje povoljnih funkcionalnih ishoda, naglašavajući efikasnost neoperativnog lečenja kod novorođenčadi.

Ključne reči: dislokacija kolena, kongenitalne abnormalnosti, konzervativno lečenje, neonatalna ortopedija.

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