

Isolated congenital genu recurvatum a case series

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Abstract— Congenital Genu Recurvatum (CGR) is a rare anomaly which can be diagnosed prenatally via imaging or following birth by a physical examination. With an incidence of 1 in 100,000 live births, CGR is defined as a pathological degree of hyperextension of the knee joint accompanied by limited flexion. CGR may occur in isolation or in association with other birth defects such as talipes equinovarus and a congenital dislocation of the hip joint. In severe cases of CGR, contracture of the quadriceps tendon does not permit reduction. At the other end of the severity spectrum, where the dislocated knee yields to reduction through manual manipulation, conservative treatment with serial Plaster of Paris (POP) casting of the joint in the reduced position has demonstrated excellent outcome. Newborn babies born in our institution during the period 2019-2022 with isolated unilateral congenital dislocation of knee joint managed conservatively is followed up till 3 months. Based on our experience, we conclude that serial casting is has shown excellent functional outcomes in patients with grade 3 isolated congenital genu recurvatum managed by manipulation and serial casting.

Keywords— Genu recurvatum, Congenital, Arthrogryposis, knee dislocation

1 Introduction

A solitary anomaly, congenital dislocation of the knee is a rare condition. It is usually associated with musculoskeletal anomalies such clubfoot and hip developmental dysplasia. Meningomyelocele is a syndrome that can be present at birth, in conditions such as Arthrogryposis Multiplex Congenita or Larsen syndrome. Oligohydramnios or breech position are the prenatal risk factors. Katz et al. suggested that the anterior cruciate ligament may be abnormal, and quadriceps contracture may also be a contributing cause.

On clinical examination, the typical posture of the knee can be used to make the diagnosis, which can then be verified by radiography and ultrasound. Serial casting, percutaneous quadriceps recession, and percutaneous quadricepsplasty are a few treatment possibilities.

2. Case series

Two infants with Grade 3 (Table 1) isolated congenital genu recurvatum studied during the period 2019 to 2022 were followed up for a period of 3 months. They were conservatively managed with serial casting. A four weekly manipulation and casting was done. Functional outcomes were followed up using modified knee function scoring system (Table 2).

Both the babies were thoroughly examined within 24 hours after birth and evaluated with radiography and the diagnosis was confirmed. (Fig.1 and Fig.2)

Both the babies were term females born by normal vaginal delivery with vertex presentation. With no abnormalities detected in the prenatal ultrasonography.

On examination, both the babies were conscious and active. The knees were in 90 degrees(baby1) and 20 degrees (baby 2) hyperextension and was reducible with gentle manipulation. The Ortolani and Barlow tests the lower limbs on both were normal.

Additional testing of the gastrointestinal, neurological, genitourinary, cardiovascular, and respiratory systems found no anomalies.

Grade	Range of passive flexion in degrees	Radiology
Grade 1	>90	Simple recurvatum
Grade 2	30-90	Subluxation /dislocation
Grade 3	<30	Dislocation

Table 1. Tareks CDK Grading system

*Grade	Flexion in degrees	Extension (Power)	Instability	Pain
E	Full	G5	Nil	Nil
G	>90	>=G3	Mild	Mild
F	45-90	G2	Mild	Mild
P	<45	<G2	Gross	Severe

Table 2. Modified knee function scoring system

3. Results

Two full term normal female babies born via normal vaginal delivery with deformity in the left knee were studied. Improvement in functionality was determined. The range of movement improved from <30 degrees to >90 degrees with reduction in pain and instability. According to Modified knee functional scoring system, an overall progress

in functionality was noted over a period of 3 months with serial manipulation and casting (Table 3.).

	At birth		1 Month		2 Months		3 Months	
	Baby 1	Baby 2	Baby 1	Baby 2	Baby 1	Baby 2	Baby 1	Baby 2
Find-ings	Hyper-ex-tended knee 90 degree	Hyper-ex-tended knee 20 degree	Un-sta-ble knee	Bet-ter	Skin rashes	Bet-ter	Better	Nor-mal
Range of move-ments	0-30 degree	Upto 90-de-gree flexion	10 - 40 de-grees	0-90 de-grees	5-100 de-grees	0-120 de-grees	5-120 de-grees	0-120 de-grees
Inter-vention	POP cast in flexion	POP cast in flexion	POP cast	POP cast	Knee brace in flex-ion	POP cast	Exer-cises taught to mother	Exer-cises taught to mother

Table 3.



Fig. 1: Clinical picture and radiograph of Baby 1



Fig. 2: Clinical picture and radiograph of Baby 2

4. Discussion

We present two newborn Indian females who underwent thorough physical examinations and were found to have isolated congenital genu recurvatum immediately after birth. It is a structural anomaly of the knee joint that manifests as excessive flexion (beyond 5 degrees) and hyperextension of the knee joint (beyond 5 degrees) (Loudon, J. K. et al., 1998). Only 1 in 100,000 live babies experience this disease, making it very uncommon (Mehrafshan, M. et al., 2016). According to Mehrafshan, M. et al. (2016), CGR can appear as a single anomaly in a newborn or as a symptom of more serious illness affecting the musculoskeletal system or even numerous bodily systems. According to Tiwari, M., and Sharma (2013), oligohydramnios, which reduces intrauterine space, may result in a "packaging disorder" that causes the foetus to mold and then misplace the knee joint. Congenital hip dislocation is the most prevalent musculoskeletal abnormality connected to CGR; it also happens concurrently with equino-varus clubfoot, scoliosis, and toe anomalies (Katz, M. 1967; Niebauer, J. J., & King, D. E. 1960). According to Mehrafshan, M. et al. (2016), two disorders that affect the musculoskeletal system more severely and extensively than CGR are arthrogryposis multiplex congenita and Larsen's syndrome. Numerous writers have attempted to categorize CGR according to severity (Mehrafshan, M. et al., 2016). The greatest range of passive movement and radiographic examinations of the afflicted limb are frequently taken into account factors. The degree of the dislocation affects the available treatments and the results.

Surgery to release the quadriceps contracture in the most severe cases of CGR is an option, but it is fraught with risks such as scarring, diminished quadriceps strength, and instability of the knee (Tercier, S. et al., 2012). On the other end of the severity spectrum, patients who have serial cast applications after corrected knee joint alignment can experience a gradual and outstanding degree of improvement (Omololu, B. et al., 2002).

In our infants, moderate manipulation made it possible to achieve a reasonable degree of bending (30 to 90 degrees). Treatment then continued with serial casting, and the result was satisfactory at three months. One out of two infants had skin rashes over the casted limb, which was managed by replacing the cast into a brace

5. Conclusion

Based on our experience, we conclude that serial casting has shown excellent functional outcomes in patients with grade 3 isolated congenital genu recurvatum managed with manipulation and serial casting.

6. References

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