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Case Report

Congenital Genu Recurvatum: A Case Report from Tanzania

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Abstract: We report a new born female who presented with severe hyperextension of the left knee joint following birth and excellent clinical outcome following conservative therapy with serial application of Plaster of Paris (POP). Congenital Genu Recurvatum (CGR), a rare anomaly of the knee joint in new-borns, is clinically diagnosed when hyperextension of the knee joint beyond 5° occurs with concomitant limited flexion. The reported incidence is 1 in 100,000 live births. Treatment is often conservative and results in excellent results. Often, it occurs in conjunction with other anomalies, warranting a complete physical examination to allow earlier diagnosis and management.

Keywords: 'congenital', 'genu recurvatum', 'conservative therapy', 'Tanzania'.

INTRODUCTION

Congenital Genu Recurvatum (CGR) is a rare anomaly which can be diagnosed prenatally via imaging or following birth by a physical examination (Mehrafshan, M. *et al.*, 2016; Barber, M. A. *et al.*, 2009). With an incidence of 1 in 100,000 live births, CGR is defined as a pathological degree of hyperextension of the knee joint (beyond 5°) accompanied by limited flexion (Mehrafshan, M. *et al.*, 2016; Loudon, J. K. *et al.*, 1998). Prenatal diagnosis can be achieved by lower limb examination during an ultrasonography assessment of the fetus (Barber, M. A. *et al.*, 2009). CGR may occur in isolation or in association with other birth defects such as talipes equinovarus and a congenital dislocation of the hip joint (Mehrafshan, M. *et al.*, 2016). In severe cases of CGR, contracture of the quadriceps tendon does not permit reduction (Patwardhan, S. *et al.*, 2015). 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 postion has demonstrated excellent outcome (Omololu, B. *et al.*, 2002). We present a new born Tanzania female with CGR and excellent outcome following conservative treatment with serial POP casting.

To the best of the author's knowledge, following a literature review of online medical data bases, this is the first case report of CGR from East Africa.

Statement of Informed Consent

Informed consent was obtained from the child's mother. The authors have ensured that the child cannot be identified by the information included in this case report.

Case Report

History

The patient was a female new-born, born at term via a spontaneous vaginal delivery and less than 24 hours old during initial examination and diagnosis. She was born as the first child of non-consanguineous and apparently healthy parents. Both parents were small scale farmers. She presented with a hyperextended knee joint and was otherwise well. At 28 weeks of gestation, the mother had undergone an obstetric ultrasound which did not pick any abnormalities.

Examination

The child was active with a normal level of consciousness and upon inspection of the left lower limb, the knee was at 90 degrees of hyperextension and gentle manipulation resulting in reduction was possible without causing distress. The Ortolani and Barlow tests

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on both lower limbs were normal. Further examination of the cardiovascular, respiratory, genitourinary, nervous and gastrointestinal system revealed no abnormality (Figure 1).

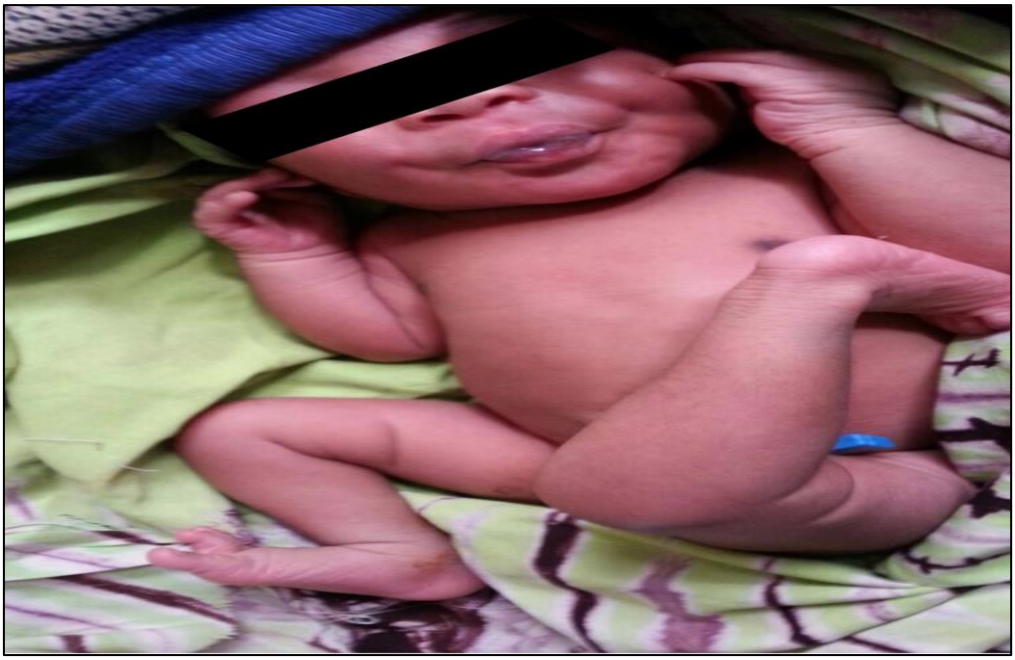

Figure 1: CGR of the left lower limb. The left knee joint at 90° of hyperextension in the resting position

Working Diagnosis

The working diagnosis was congenital genu recurvatum in a full-term infant.

Additional Examinations

Apart from a complete physical examination of the new-born, radiological examinations such as x-ray imaging (7 United States Dollars) of the left lower limb could not be done performed due to financial constraints on the part of the family.

Clinical Course

Gentle manipulation of the left knee joint was done which allowed 10° of flexion to be achieved, followed by application of an above knee POP cast in the same position. The patient attended the Orthopaedics Clinic on a weekly basis for a month following discharge from in-hospital care and during each visit, the above knee cast was removed and following evaluation of the knee joint it was reapplied with the knee in 10° of flexion. During each subsequent visit, the passive hyperextension progressively reduced and during the fourth visit, the knee joint had attained a normal structure. From initial presentation to the orthopaedic team through to the final clinic visit before cast removal, the family was able to gather enough funds for an x-ray film of the left lower limb. The imaging was done at a different health centre and the mother brought the films during the fourth visit (Figure 2 and 3).

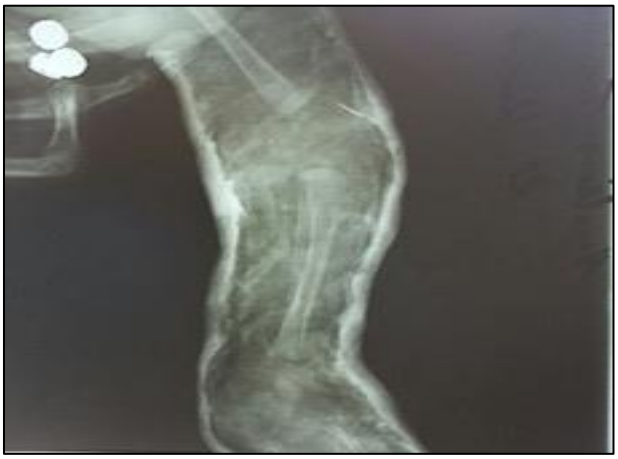

Figure 2: X-ray taken four weeks after the serial casting began. The knee is held in normal position by the cast and alignment was maintained after POP removal at four weeks

Figure 3: Normal alignment of the knee joint at four weeks after POP cast removal.

At the age of 1 year, the child returned to the Orthopaedic Clinic for a follow-up examination. She was able to stand without support and on examination; both lower limbs were symmetrical, with good muscle tone and power. Further assessment of both knees was not suggestive of any ligament abnormality.

DISCUSSION

We present a new-born Tanzanian female diagnosed shortly after birth with CGR based on a complete physical examination.

CGR is a structural abnormality of the knee joint which presents with hyperextension of the knee joint (beyond 5°) accompanied by limited flexion (Loudon, J. K. *et al.*, 1998). The incidence of this condition is rather rare as it is observed in only 1 in 100,000 live births (Mehrafshan, M. *et al.*, 2016). CGR may occur as an isolated abnormality in the new born or as a manifestation of more extensive pathology involving the musculoskeletal system or even multiple systems of the body (Mehrafshan, M. *et al.*, 2016).

It is suspected that a decreased amount of intrauterine space resulting from oligohydramnios may cause a 'packaging disorder' resulting in moulding of the foetus and subsequent mal-positioning of the knee joint (Tiwari, M., & Sharma, N. 2013). The most common musculoskeletal abnormality associated with CGR is congenital dislocation of the hip; it also occurs concomitantly with equino-varus clubfoot, scoliosis and anomalies of the toes (Katz, M. 1967; Niebauer, J. J., & King, D. E. 1960). Arthrogryposis multiplex congenita and Larsen's Syndrome are conditions that have more extensive and severe involvement of the musculoskeletal system and have also been linked to the incidence of CGR (Mehrafshan, M. *et al.*, 2016).

Attempts to classify CGR according to severity have been attempted by multiple authors (Mehrafshan, M. *et al.*, 2016). Factors taken into consideration are often the maximum range of passive movement and radiographic studies of the affected limb. Treatment options and outcomes are determined by the severity of the dislocation. For the most severe cases of CGR associated with contracture of the quadriceps, surgical release of the contracture is possible however it is associated with multiple complications such as scarring, weak power of the quadriceps and knee instability (Tercier, S. *et al.*, 2012). At the other end of the severity continuum, a gradual and excellent degree of reduction can be achieved in patients with serial cast application following corrective positioning of the knee joint (Omololu, B. *et al.*, 2002).

In our patient, gentle manipulation allowed a satisfactory degree of flexion (10 degrees) to be obtained and thus treatment proceeded with serial casting and a satisfactory outcome at one year (Figure 3).

CONCLUSION

Living with a disability in rural Tanzania often translates into discrimination and exclusion from a social life (McNally, A., & Mannan, H. 2013). Apart from allowing a normal milestone progress, early correction of the congenital and structural abnormality in our patient also prevented the family from facing the stigma of having an 'abnormal' child. Nonetheless, attitudes towards disability need to be addressed to allow a fairer integration of persons living with a disability into society.

Competing Interests

The authors declare that they have no competing interests.

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