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Relapsed hip stiffness after recovery of range of motion in a hip treated for developmental dysplasia of the hip? Think again: A case report

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ABSTRACT

INTRODUCTION: Several complications have been reported following treatment of developmental dysplasia of the hip (DDH). Local muscular spasm is an extremely rare complication. This case serves to enlighten orthopedists about various and unique presentations of idiopathic local muscular spasm, natural history of such condition, and appropriate treatment.

PRESENTATION OF CASE: A two-year-old child presented with bilateral acetabular dysplasia for orthopedic evaluation and treated with bilateral simultaneous Dega osteotomy and postoperative cast for 12 weeks. Full range of motion (ROM) of both hips was regained three months after removal of the postoperative cast. Five months later, the child presented with apparent leg length discrepancy, and severe and painless global limitation of the right hip ROM, which initially was thought to be relapsed hip stiffness. Laboratory and radiological investigations were normal apart from pelvic obliquity on radiographs. Symptoms persisted for one month. Examination under anesthesia (EUA) was then performed and revealed full ROM of the involved hip. Physical therapy was started, and hip ROM fully recovered within 3 months without further intervention.

DISCUSSION: Stiffness, which is one of the most reported complications following surgical treatment of DDH, is usually related to lengthy periods of immobilization and/or surgical treatment. Clinically, local muscular spasm of the hip can mimic stiffness. EUA is invaluable to differentiate the common postoperative stiffness from the rare local muscular spasm.

CONCLUSION: Idiopathic local muscular spasm of hip might present clinically as stiffness that pose a diagnostic dilemma to the treating physician. Close observation coupled with physical therapy is sufficient.

1. Introduction

Developmental dysplasia of the hip (DDH) is a spectrum of disorders of the developing hip that range from dysplasia of the acetabulum, subluxation, to complete hip dislocation [1]. Abduction braces or closed reduction with hip spica are mainly used for infants who are newly diagnosed. Older children may require operative treatment, including open reduction of the hip and/or acetabuloplasty, to correct the associated acetabular dysplasia [2].

Stiffness following DDH treatment in children has not been adequately investigated and unfortunately it remains an unresolved issue. Various studies in the literature have reported clinical outcomes after surgical treatment of DDH patients; however, these studies have not precisely investigated the recovery of ROM or the outcome of residual stiffness [3–6].

Additionally, muscular spasm is still not a well-understood clinical entity that is seen in various orthopedic pathologies like subtalar coalition, and torticollis. We present a unique case of operatively treated DDH that developed idiopathic local muscular spasm of the hip which looked like hip stiffness on clinical examination. This paper has been written according to the SCARE 2018 statement [7].

2. Presentation of case

A two-year-old female child referred to our tertiary hospital for the treatment of bilateral acetabular dysplasia. The child was healthy and not known to have chronic medical problems, and milestones were up to date. The gait examination was normal, although the parents expressed their concerns that the child sometimes limped after running or jumping activities. Local hip examination showed normal skin, and painless full ROM of both

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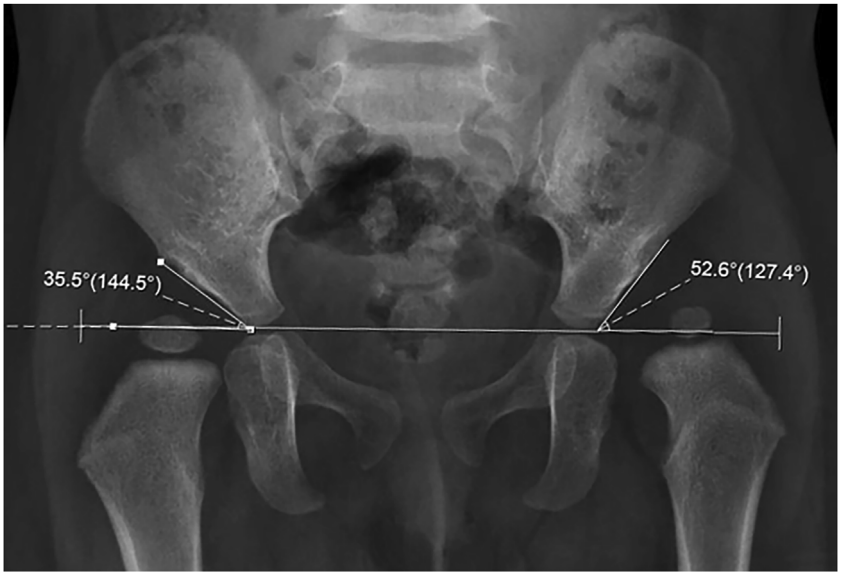

Fig. 1. Supine pelvic radiograph shows bilateral DDH with the acetabular index measurement.

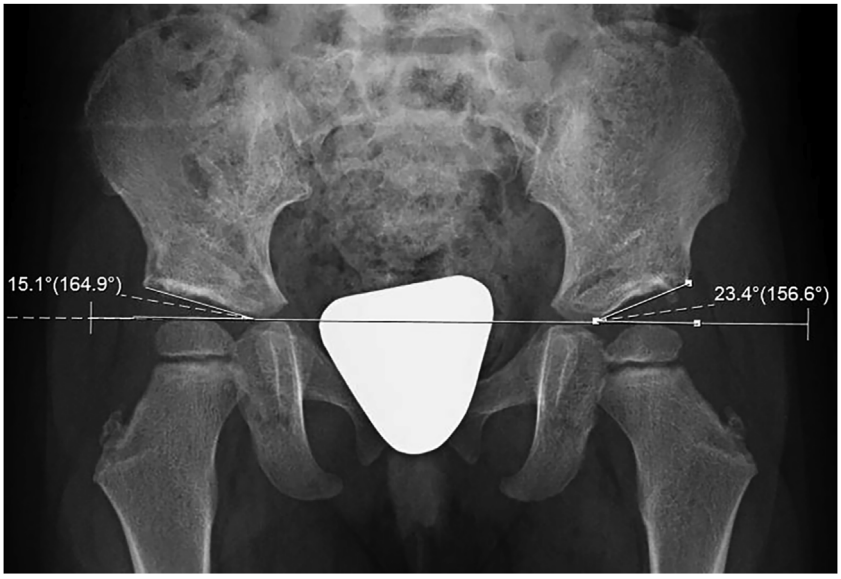

Fig. 2. Postoperative pelvic radiograph with the acetabular index measurement.

hips with mild limitation on abduction of the left side by 10° compared to right side.

Radiographs revealed bilateral DDH with acetabular dysplasia, which was graded using the Tonnis classification to be grade I and grade II, and acetabular indices measured 35° and 52° for the right and left hips, respectively (Fig. 1) [8]. Because of the child's age, the acetabular index, and the morphology of the acetabular roof being flat rather than rounded, the child was considered by the treating surgeon to have acetabular dysplasia that was unlikely to improve spontaneously with time [9]. After discussion with the child's parents, the decision was made that surgical intervention would be a good option. EUA showed stable hips, even with arthrographic evaluation. The need for open hip reduction was negated by the abovementioned findings, and bilateral Dega osteotomy utilizing a contoured iliac crest allograft was confirmed as the procedure of choice to improve coverage of the femoral heads [10,11]. After the procedure, a hip spica was applied for 6 weeks. On the first visit at 6 weeks, spica was converted to a broomstick cast for another 6 weeks (Fig. 2). The cast was discontinued on the second clinic visit after 12 weeks. Because open reduction was not performed as part of the procedure, the recovery of the hip ROM was very quick. On the third clinic visit at 24 weeks, the child presented to the clinic with normal gait, and full symmetrical ROM in both hips as assessed by the treating surgeon.

On the fourth clinic visit that is 44 weeks from procedure, the parents reached out to the treating surgeon concerned about new-onset severe limping and restricted right hip ROM. Clinical examination of the child confirmed the parents' concerns. The child walked with a stiff hip gait, holding her right hip in a position of flexion and abduction. The ROM of the right hip was clearly restricted but painless, and the child involuntarily resisted any attempts of passive ROM. Secondary to the right hip position, the child had a compensatory pelvic tilt. The ROM of the right hip was 70° of flexion, -20° extension, and 15° of IR and ER. Abduction and adduction were 25 and 0°, respectively. Clinically, the child did not have any

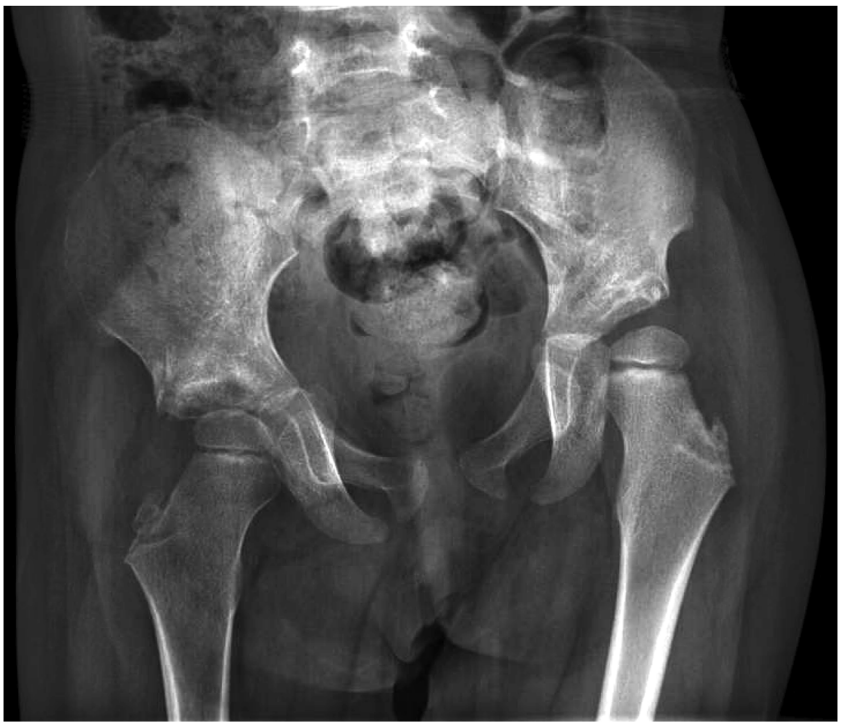

Fig. 3. Standing pelvic radiograph shows improvement in the femoral head coverage bilaterally with marked pelvic obliquity to the right hip.

signs of infection nor complained of pain, and laboratory investigations were within normal limits. Patient was not able to properly sit or walk after the development of what clinically appears to be stiffness of right hip.

Radiographs showed that both hips were well located and covered, and apart from the pelvic tilt, it was a non-concerning study (Fig. 3). Due to the uncertainty of such presentation, magnetic resonance imaging study was performed and it did not show any concerning intra-articular or soft tissue pathology. The child continued to have the problem and was taken for EUA and possible gentle manipulation of the right hip 1 month after presentation. The moment the child was anesthetized, the right hip became relaxed assuming the same position as the other hip. The EUA showed that the right hip ROM was full and identical to the left side with no signs of stiffness, clicks, or mechanical impingement. The hip arthrogram was normal. The assumption was made that the cause

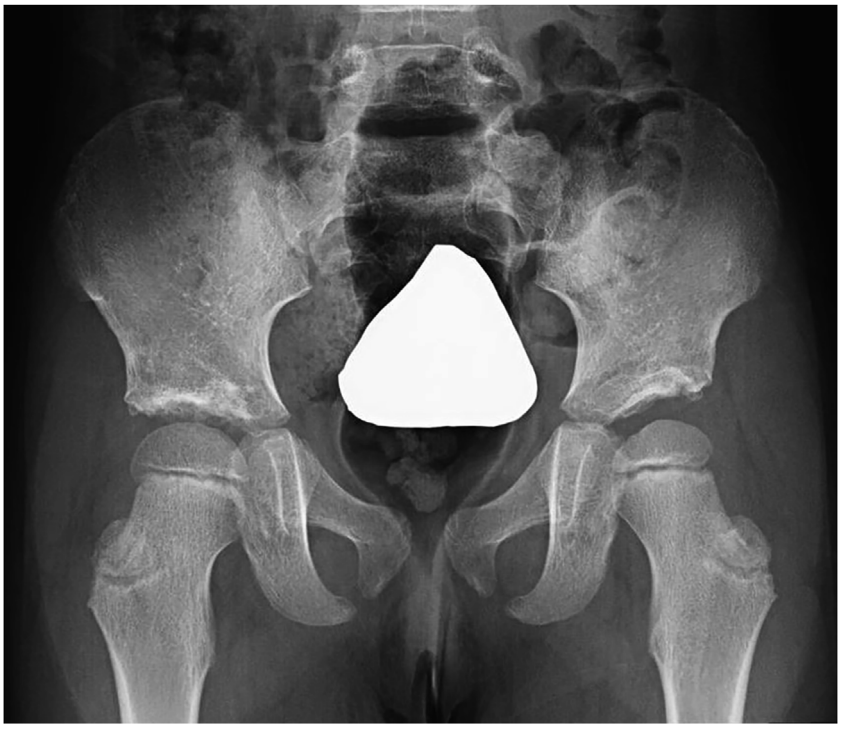

Fig. 4. Standing pelvic radiograph shows resolution of pelvic obliquity.

of stiffness was painless generalized idiopathic muscular spasm of hip. The child was given follow-up in the clinic with formal referral to a physical therapy. The spastic muscles surrounding the hip gradually improved over a period of 3 months. The child gradually regained full active and passive ROM, and a recent radiograph revealed resolution of the pelvic obliquity and excellent femoral head coverage (Fig. 4).

3. Discussion

Several possible complications might occur after DDH treatment. Clearly, hip stiffness in DDH is unavoidable in the course of surgical treatment that involves open hip reduction and lengthy periods of immobilization, and is considered one of the most common complication [12,13]. However, local muscular spasm of the operatively treated hip has never been reported and that posed a diagnostic dilemma in our case as clinical presentations of stiffness and spasm share several similarities. In our unique case, the hip joint was not opened, as the child had only acetabular dysplasia, which was managed by Dega osteotomy. As a result of that procedure, the child regained hip ROM quickly during the first 3 months after removal of the postoperative cast.

It has not been mentioned in the literature that patients might develop acute relapses in ROM of their hips. Oddly, the child in the presented case developed a significant relapse in ROM of the right hip after obtaining full ROM. All the logical reasons that could explain this relapse, such as infection, inflammation, trauma, or chondrolysis, were ruled out by laboratory and radiological studies. Clinical concern of a relapse in hip stiffness was raised and the decision was made to examine the hip under anesthesia. EUA showed full ROM of the involved hip which ruled out stiffness and confirmed the possibility of muscular spasm as a contributing element to the condition. Therefore, the diagnosis of idiopathic local muscular spasm was assumed to be the most likely explanation.

To our knowledge, there is only one case report from Turkey that is closely related but not identical to this condition in which the native hip was openly reduced as part of the treatment. Akgul et al. called this condition “local idiopathic hypertonia” and showed that it may improve by using botulinum TOXIN A therapy. Although surgical release of the involved muscles was performed in that case, the condition recurred later which indicates the etiology is muscular [14].

EUA is invaluable to differentiate whether stiffness is true stiffness or local muscular spasm, as demonstrated in our case. In such scenario, causes such as infection, inflammation, or chondrolysis, should be suspected first and investigated. If they have been ruled out, localized muscular spasm can be entertained as the cause of this vague and uncommon problem.

4. Conclusion

We propose that if this condition is suspected in a child and that an MRI study is requested under general anesthesia as a part of the investigations, the surgeon should join the radiologist to examine the involved hip under anesthesia to confirm his or her suspicion and negate the need for a second general anesthesia session. The moment this rare problem is confirmed, we recommend a conservative approach in the form of physical therapy and close observation. Botulinum toxin A therapy has been used for different pathologies in which spasticity or muscular spasm is an element and has been shown to be beneficial with good results [15]. Surgical intervention should probably be reserved for severe and resistant cases, however, the outcome of surgical release is still unknown.

Declaration of Competing Interest

The authors declare that they have no conflict of interest

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Ethical approval

The study is exempt from ethical approval in the institution where the research was conducted.

Consent

Written informed consent was obtained from the patient’s parents for publication of this case report and accompanying images.

Author contribution

Dr. Hasan Alanazi: managed the patient, conceptualization, literature review, case description and discussion, collected the images from the patient file, writing - original draft, corresponding author.

Dr. Faisal Almalik: conceptualization, literature review, case description and discussion, resources, writing - review & editing.

Dr. Naif Alanazi: conceptualization, literature review, case description and discussion, resources, writing - review & editing.

Dr. Thamer Alhussainan: managed the patient and did the surgery, conceptualization, case description and discussion, supervision.

All authors read and approved the final manuscript.

Registration of research studies

Not applicable.

Guarantor

Dr. Hasan Alanazi, Dr. Faisal Almalik, Dr. Naif Alanazi, and Dr. Thamer Alhussainan.

Provenance and peer review

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