



Case report

Proximal release for injections induced hip flexion contracture in a child: A case report

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ABSTRACT

Introduction: Quadriceps contracture can be congenital or acquired; however, multiple intramuscular injections are one of the major identified causes of this lesion that can manifest in two forms: either isolated rectus femoris or combined with quadriceps contracture.

Case report: this article presents a case of a 9-year-old boy with a recurrent isolated rectus femoris contracture that was released proximally with a satisfactory result after one-year follow-up.

Discussion: Treatment differs based on the degree of knee flexion loss and the affected muscles, as it can be either proximal release or distal quadricepsplasty. Extended physiotherapy and close follow-up are mandatory for successful treatment.

Conclusion: Proximal release of the hip flexion contracture with positive Ely's test can be effective in restoring knee flexion and improving function in patients with quadriceps contracture induced by iatrogenic injection.

1. Introduction

Quadriceps contracture have always been a controversial entity in the literature, while it can be congenital, idiopathic or in combination with arthrogryposis, it can also be induced by trauma, infection or muscular injections [1,2].

It presents mainly as progressive loss of knee flexion, with difficulty in sitting, squatting, or running.

First reported in the literature by Lloyd Roberts, et al. as they described six cases in which only half of them had adequate outcomes at final follow up after undergoing distal quadricepsplasty [3]. Although the precise etiology of the disease is not yet understood, it is definitely linked to multiple muscular injections [4].

It may manifest in isolated rectus femoris contracture or combined rectus and quadriceps contractures, it is crucial to distinguish between these two manifestations as each one requires its distinct treatment. The isolated rectus contracture is preferably treated proximally while the combined quadriceps form is suitably released distally [5].

this article presents a case of a 9-year-old boy with a recurrent isolated rectus femoris that was released proximally, and actually it might be more complex than just an isolated rectus femoris contracture, rather, a proximal hip flexion contracture.

This case report has been reported in accordance with SCARE 2020 standards [6].

2. Case report

A 9-year-old Caucasian male attended our ortho-pediatric clinic complaining of progressive difficulty in sitting, squatting, and abnormal gait, especially when running.

He was a term male delivered spontaneously per vagina, with no systemic abnormalities nor congenital malformations, his parents mentioned a history of a urinary tract infection 3 years ago that required repeated injections into his left thigh.

1.5 years ago, he sought an orthopedic surgeon for treatment, he was diagnosed with left isolated proximal rectus femoris contracture based on Ely's test [7] and treated with proximal release.

Visual examination revealed an anterior scar on his left hip as a result of Smith-Peterson approach from the previous surgery.

On physical examination, he had severe lack of knee flexion when his hip was extended (15°) that improved to (120°) when the hip was flexed (Fig. 1). The rest of the musculoskeletal examination was unremarkable.

Hip AP x-ray exhibited an excess bony formation upon the superior anterior iliac spine (SAIS) probably due to the previous surgery that

Abbreviations: SAIS, superior anterior iliac spine.

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damaged the epiphysis or from dissection as heterotopic ossification is a known complication in anterior hip approaches [8] (Fig. 2).

His father mentioned a minor improvement after the previous surgery. However, the child's capabilities started to deteriorate after several months post-surgery. He consulted his doctor who referred him to physiotherapy that he has been doing for almost a year with no significant improvement. We decided to revise the patient under general anesthesia in the supine position; we excised the scar and went in the Smith-Peterson interval between the Sartorius and the Tensor Fascia Lata which was fibrotic and scarred, the direct head of the rectus wasn't found, however, the reflected head was intact so we released it and got a slight improvement his hip was still tight in extension that further releases were necessary; first, we excised the bony prominence starting from the SAIS into the abductor's mass then we partially released the tensor fascia lata and the sartorius fascia while protecting the lateral femoral cutaneous nerve, then we lengthened the iliopsoas at the tendomuscular junction while protecting the femoral nerve. There were some fibrotic bands that we excised by electrocautery from the anterior surface of the hip capsule then major improvement was obtained (Fig. 3).

Hemostasis was done, and a drain was used as there was a dead space and a potential risk for hematoma formation, the drain was withdrawn within two days then the patient was discharged and started physiotherapy in the second week after the surgery, regular checkup visits within two weeks intervals for two months showed major improvement with good wound healing. He has been following an intense physiotherapy program since then.

We examined the patient after six months, the flexion range of 120° was preserved in hip extension and he had a normal gait. One-year follow-up showed the same findings. He has been following an intense physiotherapy program since then.

3. Discussion

According to wolf's law, forces acting on pediatric bones-which is more elastic- affect its growth [9], thus abnormal forces and kinetics around joints produce abnormal growth and development of deformities, and it is crucial especially in the lower extremity to maintain normal muscles balance during growth, also the contracted muscles and limited motion severely affects function and daily life activities.

As mentioned, quadriceps femoris muscle contracture manifest mainly in two forms: The first one is isolated rectus femoris contracture with limited knee flexion in hip extension and normal range of motion in hip flexion, and the second form is combined contracture of quadriceps with restricted knee flexion whether the hip is flexed or extended, and we distinguish between the two by Ely's test which is very important as if the quadriceps is fully contracted, it is preferably released or lengthened

distally while if it is isolated rectus femoris contracture better outcomes are obtained with proximal release [1,7],

There are several techniques for quadricepsplasty whether the contractures are iatrogenic or post-traumatic [10,11], Burnei, Gheorghe et al. found in severe iatrogenic infantile quadriceps retraction when comparing the modified Judet technique and the Payr-Thompson technique, the latter to be more effective at 3 years follow up [12].

Jackson, A M, and P A Hutton studied 32 contractures of the quadriceps in 17 children comparing conservative, distal quadricepsplasty, and proximal release and found the best outcomes with proximal release where 70 % of the distal quadricepsplasty had extensor lag, and the conservative group at best prevented further progression [1].

Sasaki, T et al. studied Sixty-five patients (73 legs) with quadriceps contracture involving mainly the rectus femoris muscle, and they used three different techniques and the best outcomes were obtained by the release of the fibrosis [13].

Mukherjee, P. K., & Das, A. K. studied Fifty cases of quadriceps contracture in thirty-seven children treated by quadriceps elongation and they obtained good outcomes only in thirty cases [14].

Milcan, A et al. reported a case of a 2.5 years old girl who received several muscular injections into the left thigh and developed quadriceps contracture, but the outcomes of proximal release were poor although she had a positive Ely's test so she underwent a Thompson distal quadricepsplasty which rendered 110° of flexion [4].

So, it is still controversial and every case should be assessed and managed individually, there is no effective definitive procedure for all cases, as the exact etiology is not yet fully understood, the two forms of the contracture can be congenital, or induced by fractures, prolonged immobilization, infection or intramuscular injection [2,14-16].

The rate of successful outcomes is not always high [3,14], recurrence is not uncommon, and physiotherapy is mandatory although it will not overcome unsuitable surgical decision or improper technique.

These types of contractures are very common in Syria, since intramuscular injections are the preferred method for drug administration by most health practitioners, however, we should be in an era where most medicine should be prescribed orally or intravenously if necessary.

4. Conclusion

When combined with extended physiotherapy, proximal release of the hip flexion contracture with positive Ely's test can be effective in restoring knee flexion and improving function in patients with quadriceps contracture due to multiple iatrogenic injections. Close follow-up is mandatory as recurrence may occur.



Fig. 1. Ely's test showing normal knee flexion when the hip is flexed but extreme lack of knee flexion when the hip is extended.

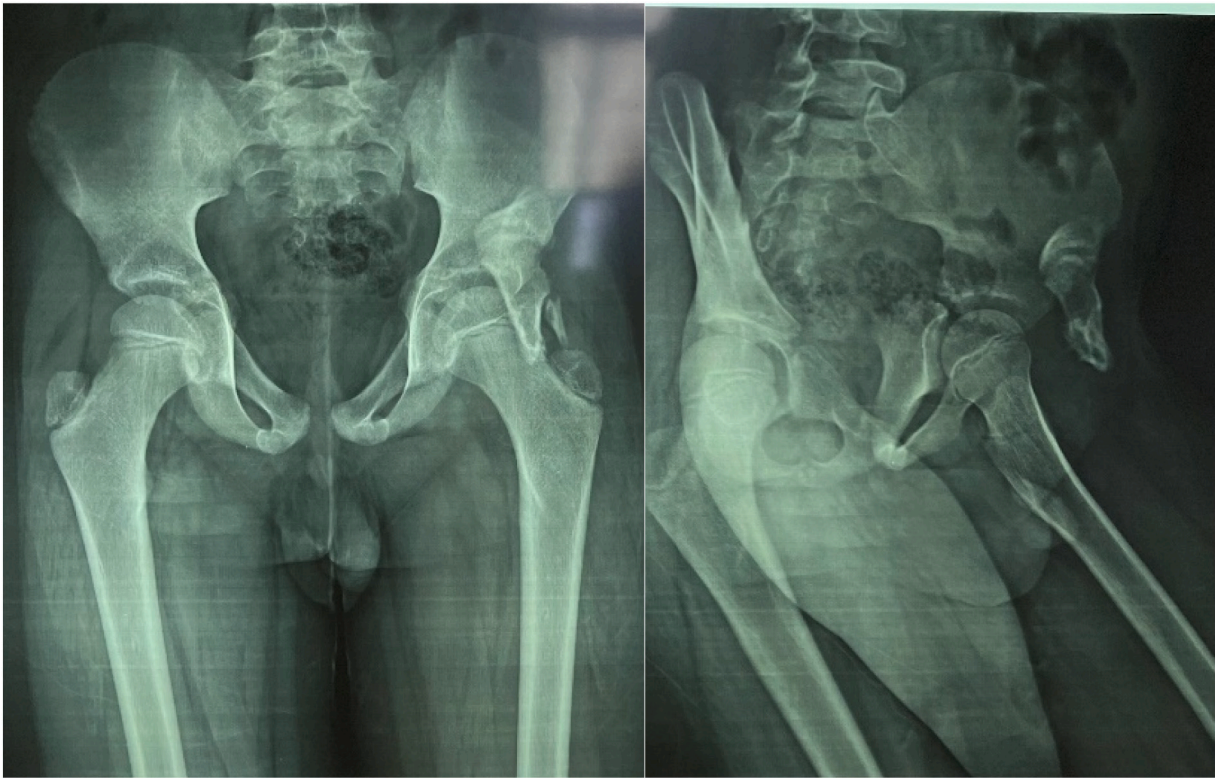


Fig. 2. Plain x-ray shows no abnormalities but heterotopic ossification.



Fig. 3. Immediate improvement after the surgery which we successfully maintained with the continuum of physiotherapy.

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Ethical approval

This study is exempt from ethical approval in our institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Declaration of competing interest

The author has no conflicts to disclose.

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