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Quadriceps retraction, problem of late diagnosis in one case

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Abstract
Introduction: Treatment is well codified and produces good results when carried out correctly.
In cases where the diagnosis is made early, orthopedic treatment with a series of casts is sufficient to restore normal knee mobility. Delayed treatment leads to complications that make treatment difficult and results unsatisfactory. In these cases, surgery remains the only alternative.
In this paper, we report a case of quadriceps retraction associated with bone deformities due to late diagnosis.
Observation: We report the case of a 15-year-old girl with no particular medical history who presented with quadriceps retraction and bone deformities following intramuscular injections in the thigh. She was treated in our department under spinal anesthesia. We performed a quadriceps release using the Judet technique combined with a distal femoral flexion osteotomy fixed with a locked anatomical plate. The postoperative course was uneventful, with primary healing of the surgical wound and knee rehabilitation.
Conclusion: Post-injection quadriceps retraction still exists in our settings. It can go unnoticed. Late diagnosis leads to morphological bone changes and makes treatment difficult. Surgery then remains the only alternative.

Keywords: Retraction, quadriceps, diagnosis, Judet

Introduction
Quadriceps muscle retraction causes limited knee joint mobility. This condition is not uncommon. In the medical literature, the most common cause remains intramuscular injections in the thigh [1].
Treatment is well codified and produces good results when carried out correctly.
In cases where the diagnosis is made early, orthopedic treatment with a series of casts is sufficient to restore normal knee mobility. Delayed treatment leads to complications that make treatment difficult and results unsatisfactory. In these cases, surgery remains the only alternative.
In this paper, we report a case of quadriceps retraction associated with bone deformities due to late diagnosis.

Observation
A 15-year-old girl. The eldest of five children. Born after a monitored, full-term pregnancy. She had no malformations at birth. Her birth weight and height were 3100g and 49cm. In the months following her birth, she received intramuscular injections in her thigh as part of the newborn vaccination program. Eight months after birth, when the baby began crawling on all fours, her parents noticed a lack of knee flexion. Several medical consultations were undertaken from that point on, without any favorable outcome.
We received a patient in our department who walked with a limp and had a deformity of the right lower limb. The deformity consisted of a recurvatum knee and an equinus foot with support on the tip of the right foot when walking.
The recurvatum of the right knee was 24° with posterior protrusion of the femoral condyles, such that when the patient was in the supine position, the heel of the foot could not rest on the bed. The equinus deformity of the ankle was reducible, with normal and painless movements.

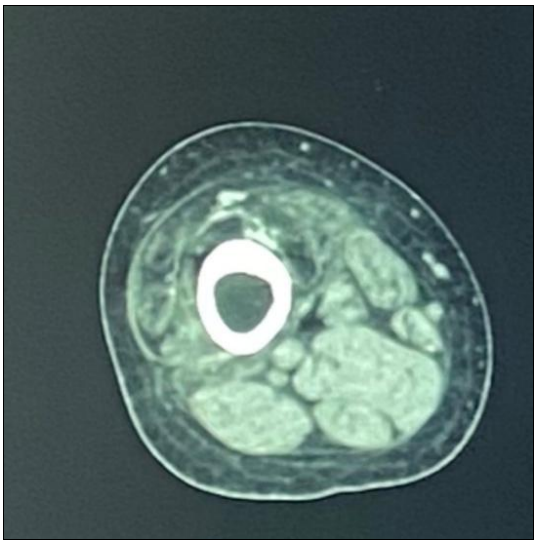
Fig 1: Clinical image of the right knee deformity

The patella was elevated. No sagittal plane mobility of the knee was possible. There was laxity in the frontal plane. There was a 5 cm difference in leg length (80 cm on the right and 85 cm on the left). There was 8 cm amyotrophy of the right quadriceps compared to the contralateral side.
Examination of the ipsilateral hip and spine was unremarkable. There were no signs of any neurovascular involvement.
The requested knee X-ray revealed:

1. Dysplasia of the femoral condyles
2. An elevation and demineralization of the patella
3. Posterior tilt of the upper end of the tibia

Fig 2: Front and side X-ray of the right knee

The muscle-window CT scan revealed: A decrease in the volume of the entire quadriceps, associated with fibrous degeneration of the muscle.



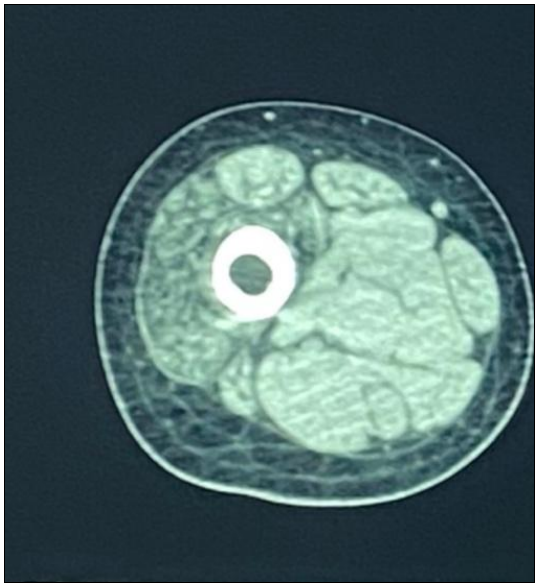


Fig 3: Axial CT scan of the right thigh

Blood tests were normal. We decided to perform a distal femoral osteotomy with posterior subtraction flexion, combined with quadriceps release using the Judet technique. We achieved 100° of knee flexion on the operating table.

Fig 4 and 5: Judet release

The follow-up X-ray showed the correct level of osteotomy, correction of the recurvatum, and correct positioning of the implant.

Fig 6: Follow-up X-ray.

The postoperative course was uneventful. We did not observe any skin necrosis. Rehabilitation began on day 5 after removal of the Redon drain.

Fig 7 and 8: Postoperative skin condition.

Six months after the operation, knee flexion was 95°. The patient was able to sit properly.

Fig 9: Knee flexion 6 months post-op.

Discussion

Quadriceps retraction with knee stiffness was first described by Hnevkovsky [2].

Since this publication, several theories on the etiology have been put forward. The causes have been grouped into congenital and acquired.

Acquired causes include intramuscular injections, infections, and trauma [3, 4]. Rare causes such as sickle cell disease have been reported [5].

In some subtle cases, the diagnosis may not be obvious. MRI makes it easy to diagnose and classify the condition. It reveals: a decrease in thigh muscle volume, the presence of fibrous structure, and fatty atrophy [1, 6]. In developing countries where access to MRI is not always easy, it is important to consider this possibility.

Parents should be questioned thoroughly and repeatedly if necessary. Always ask about intramuscular injections into the quadriceps. CT scans remain a good alternative if MRI is not available.

In severe cases with significant knee stiffness, diagnosis seems easier. However, in our context, due to a lack of orthopedic specialists, this condition may go unnoticed. As access to MRI is not easy, we preferred to request a CT scan.

The skeleton of a growing child is subject to morphological changes. Hueter-Volkman's law or Delpech's law [7] explains the bone changes observed in our patient. These bone deformities are mainly a reflection of the long duration of the disease.

This delay in diagnosis is responsible for disabling sequelae and makes treatment tedious.

Several surgical techniques are available for the management of this condition [8, 4]. These include the Judet technique and the Payr-Thomson technique. All these techniques are based on the principle of releasing and lengthening the quadriceps. We used the Judet technique. Although this technique is debilitating, it allows for significant release of the quadriceps.

The complications specific to this procedure are mainly skin necrosis, healing problems, and fracture during rehabilitation [4]. None of these complications were found in our patient.

Conclusion: Post-injection quadriceps retraction still exists in our settings. It can go unnoticed. Late diagnosis leads to morphological bone changes and makes treatment difficult. Surgery then remains the only alternative.

Conflict of Interest
Not available

Financial Support
Not available

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