

Clinical case

# Bilateral chronic compartment syndrome of the thenar muscles: A case report

## *Syndrome chronique bilatéral de la loge thénarienne : à propos d'un cas*

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### Abstract

This case report features a patient with chronic bilateral compartment syndrome of the thenar muscles, which had appeared spontaneously 8 years earlier. The condition was progressive and symptoms recently had become worse. Pressure measurements were performed three times to establish the diagnosis: before, immediately after and 10 minutes after hand exertion. Pain relief was achieved by performing a fasciotomy of the right thenar compartment.

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**Keywords:** Chronic compartment syndrome; Thenar compartment; Hand; Fasciotomy

### Résumé

Nous rapportons le cas d'un patient atteint de syndrome chronique bilatéral des loges thénariennes, d'apparition spontanée il y a 8 ans et d'intensité progressivement croissante, avec aggravation récente des symptômes. La mesure des pressions au sein de ces loges avant, à l'arrêt, puis 10 minutes après l'arrêt de l'effort, a permis de confirmer ce diagnostic. La fasciotomie de la loge thénarienne droite a permis de traiter efficacement les douleurs.

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**Mots clés :** Syndrome des loges chronique ; Loge thénarienne ; Main ; Fasciotomie

## 1. Introduction

Compartment syndrome is defined as increased pressure within a relatively inextensible space surrounded by fascia and bone. This increased pressure within the compartment leads to reduced venous return, and thereby tissue ischemia because of the reduced arteriovenous pressure gradient [1]. This condition can be either acute or chronic, with the acute syndrome being most common. Chronic compartment syndrome is due to increased pressure during varying degrees of exertion.

Chronic compartment syndrome in the upper limb has been described mainly in the forearm [2–5]. It is more rarely described in the hand. In the case presented here, it affects the first dorsal interosseous space, and atypically the muscles of the thenar compartment [5–10]. After describing one case of chronic bilateral thenar compartment syndrome, we review the published literature in this area.

## 2. Case report

This was a 30-year-old male patient with disabling pain upon physical exertion on the volar side of both hands over the

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thenar eminence whose symptoms had recently become worse. The patient was right-handed, worked as a mechanic in the army and was a recreational motocross rider. He had previously undergone surgical procedures for the same type of symptoms in both legs in 2008 and in both forearms in 2011. Despite the decompression resulting from fasciotomy of the antebrachial compartments, the symptoms recurred in both hands. His pain was typical of exertional compartment syndrome. It increased with the intensity of the physical activity, mainly during precision pinch movements between the thumb and index finger or when the thumb was moved. The pain was very disabling during occupational and sports activities, but stopped spontaneously 15–45 minutes after the exertion ended.

To confirm the diagnosis of exertional compartment syndrome, pressure was measured in the thenar compartment of each hand under local anesthesia during an intense effort requiring use of the muscles in this compartment. A first set of measurements was taken at rest. The thenar muscles were then activated by having the patient squeeze a 50-mm diameter rubber ball used in rehabilitation until the pain started. A second measurement was taken immediately after the exertion ended, and a third one 10 minutes later. The Stryker® needle was removed from the compartment between each pressure measurement (Table 1).

The patient's right hand was operated under regional anesthesia to carry out fasciotomy of the superficial palmar fascia surrounding the thenar compartment (Figs. 1 and 2) and to open the perimysium of the muscles in this compartment (adductor pollicis brevis, adductor pollicis, flexor pollicis brevis, opponens pollicis) (Fig. 3) in January 2013. The 2.5 cm incision was centered over the thenar compartment (Fig. 4). We performed a fasciotomy in this compartment while dissecting every perimuscular and intermuscular tissue likely to trigger the symptoms felt by the patient. The postoperative recovery was uneventful. The patient was seen again in the clinic 1 month postoperative. His symptoms had completely disappeared. He was able to resume his occupational and sports activities at a nearly normal level. A telephone follow-up 6 months after the procedure confirmed his good postoperative recovery. The patient no longer had pain; the grip strength and pinch strength in his right hand were equal to those before the symptoms started. His quality of life was normal again with a QuickDash score of 11. Despite initially having similar symptoms in his left hand, the patient never returned to have his left hand operated on. During a telephone follow-up 6 months after the initial procedure, he reported little discomfort in his left, non-dominant hand, and wanted



Fig. 1. Surgical approach shown on a cadaver specimen.

to wait for his symptoms to get worse before undergoing the procedure.

### 3. Discussion

Compartment syndrome is a rare condition. It occurs acutely in most cases, generally in compartments of the legs and forearms. It is rarer in the first dorsal interosseous space of the hand, and extremely rare in the thenar compartments. Only three such cases have been described in published studies (Table 2) [5,11]. Two hypotheses have been put forward to



Fig. 2. Superficial palmar fascia before fasciotomy on a cadaver specimen.

Table 1  
Pressures measured in the patient's thenar compartments and normal pressure values.

	At rest	Immediately after exertion	10 min after exertion
Normal	< 15 mmHg	< 30 mmHg	< 15 mmHg
Left hand	17 mmHg	61 mmHg	38 mmHg
Right hand	16 mmHg	58 mmHg	29 mmHg

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