

# Anterior chronic exertional compartment syndrome of the leg

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# CHAPTER 9

## VALORIZATION

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## **INTRODUCTION**

Chronic exertional compartment syndrome (CECS) of the leg is a condition seen mostly in young and otherwise healthy individuals. However, as is demonstrated in this thesis, elderly may also suffer from CECS during sportive activities or walking. Although the exact incidence in the general population is unknown, CECS is believed to be the underlying cause in a considerable portion of patients with exercise related leg complaints.<sup>1</sup> In specialized outpatient clinics evaluating a highly selected population, up to half of the patients with exercise-induced leg complaints is diagnosed with CECS (**chapter 2**). Moreover, the fact that yearly one out of every 2000 active military service members is diagnosed with CECS may be indicative that CECS is also not uncommon in the general population.<sup>2</sup>

We are convinced that CECS is greatly underdiagnosed and, thus, undertreated. Many affected individuals reduce their sportive activities on their own initiative, thereby lowering complaints to an acceptable level and deterring them from consulting a clinician. Those who do seek medical help, risk to be confronted with unawareness as most physicians and physiotherapists are unfamiliar with specifics of the condition. As a consequence, many individuals with CECS experience prolonged leg complaints or may never be diagnosed as such.

## **SOCIAL AND ECONOMICAL RELEVANCE**

Recent years have seen an increasing interest in preventative medicine.<sup>3</sup> A growing body of evidence suggests that it is better to prevent chronic diseases rather than treat once symptoms emerge. Prevention of certain diseases such as lung cancer and chronic obstructive pulmonary disease by reducing known risk factors such as smoking is well accepted by the community. Numerous other chronic illnesses are related to a sedentary lifestyle, and promoting a healthy and sportive lifestyle may serve as highly effective primary prevention. In fact, it has been shown that individuals who adhere to a healthy and active lifestyle at mid-life have a longer life expectancy free of major chronic diseases.<sup>4</sup> In addition, evidence suggests that engaging in exercise has a positive influence in patients with cardiovascular disease, pulmonary disease, metabolic diseases and some psychiatric diseases.<sup>5</sup>

Patients with CECS experience complaints during sports and even during regular everyday activities. This thesis reports that a substantial portion of patients is hindered also during rest, in contrast to generally accepted beliefs. Due to these invalidating complaints, most patients with unrecognized and/or untreated CECS will adapt their lifestyle or abandon sports. Many CECS patients already experience complaints in everyday life and some are not able to continue their current job and may withdraw from the labor market. On the other hand, undiagnosed patients may undergo a host of non-specific therapies that are often costly and time-consuming. Being unable to participate in sports and/or everyday activities will negatively affect quality of life. Furthermore, lowering physical activity will increase the likelihood of chronic diseases later on in life including obesity, cardiovascular disease, pulmonary disease, and diabetes.<sup>4</sup> As such, early recognition and proper treatment of CECS may prevent individuals from quitting sports and reducing physical activity. Moreover, invalidating or incapacitating and costly chronic diseases that may occur later on in life may be prevented.

## RELEVANCE IN THE MEDICAL FIELD

CECS is a condition that most physicians do not diagnose on a daily basis. As such, it may be difficult to recognize as is illustrated by the average doctor's delay of several years. The first chapters in this thesis were aimed at increasing knowledge on CECS and helping clinicians in its recognition. In **chapter 2**, we have constructed a predictive nomogram that may aid in identifying CECS in patients with exercise-induced leg complaints. With this tool, clinicians may select patients requiring invasive intracompartmental pressure measurements. In **chapter 3** we demonstrate that characteristics and symptomatology of older CECS patients ( $\geq 50$  years) differ from their younger counterparts. As current knowledge on CECS is based on young and healthy patients, these findings may aid in recognizing CECS in older patients with exercise-induced leg complaints. In **chapter 4** we compared a cohort of CECS patients with a cohort of peripheral artery disease (PAD) patients who experienced intermittent claudication (IC). The differences in characteristics and symptomatology between both populations were substantial and may be used to recognize CECS in individuals who visit a vascular surgeon with IC.

The second main goal of this thesis was to introduce and test a novel tool for the surgical treatment of CECS in the anterior compartment of the leg (ant-CECS). Several techniques exist but none were compared in a randomized manner. Moreover, continuously varying outcome parameters make comparison of efficacy and safety of the different techniques difficult. In **chapter 5** we demonstrated that our newly introduced FascioMax system was safe and feasible. In **chapter 6** we investigated the potential risk on one of the most invalidating complications after a fasciotomy of the anterior compartment, namely injury of the superficial peroneal nerve (SPN). Using this novel system, the SPN was never injured in 9 cadaveric legs nor in 64 patients. Lastly, **chapter 7** compared efficacy, postoperative pain and complications of the Fasciomax system with a well-known alternative fasciotome during a semiblind fasciotomy of the anterior compartment. In addition, a questionnaire was introduced that allows for quantifying the effect of surgery on all 5 cardinal symptoms associated with CECS. Introduction of these methods may facilitate future comparison of efficacy of treatment modalities for CECS.

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