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CASE REPORT

THERMOGRAPHY IN THE EVALUATION OF "TENNIS ELBOW" TREATMENT OF A VIOLINIST – CASE REPORT

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ABSTRACT

Measurements during physical therapy and rehabilitation process are considerable contribution to the patient and therapist cooperation, better compliance and persistence. In this regard, thermography (TG) as a diagnostic method can be very helpful. It is also suitable for tracking the course of the disease because it may show activation or calming the process and can be repeated without harm to the patient. Technological progress has now made it easy and economically acceptable use of TG via a smartphone with a FLIR camera. By elaborating the TG application process, while respecting the thermal environment during measurement (the desired temperature of the environment between 50 and 75 F), we will confirm the credibility of non-aggressive Physical and Rehabilitation Medicine procedures, as well as enable scientific monitoring and better interpretation of treatment results. Due to technological progress, we consider that there is a great potential for wider application of thermography in physical and rehabilitation medicine in the future. In this paper we have presented the course and effectiveness of treating the violinist with tenosynovitis and epicondylitis of the left hand.

INTRODUCTION

The necessity of measurement in Physical and Rehabilitation Medicine as a contribution to evidence-based medicine is also supported by Lord Kelvin: "I often say that if you can measure what you are talking about and express it in figures, then you know something about it; but when you cannot figure it out, your knowledge is miserable and inadequate. This may be the beginning of knowledge, but whatever it is, this knowledge could hardly be the beginning of science (Bork, 1993). In earlier papers (Krapac and Zergollern, 1981; Krapac and Jajić, 1983; Krapac *et al.*, 1990; Krapac *et al.*, 1992; Krapac *et al.*, 1995; Krapac *et al.*, 2001; Vodanović *et al.*, 2009; Grubišić *et al.*, 2009) we emphasized the importance of verification (expressed in numbers) morphological and functional changes in the musculoskeletal structures of professional musicians. Each violinist, even the identical twins, have a characteristic left hand grip, which is significantly more biomechanically loaded in comparison to the right arm in which the bow is (Krapac *et al.*, 1990), (Fig. 1). The musicians are often disimulants (Krapac, 2012) – they have problems (swelling and joint pain) but they do not pay attention because they are satisfied with their work. They neglect a fatigue, and even the back pain, resulting in diseases known as "overuse syndrome",

but also painful cervicobrachial syndrome, tendinitis and tenosynovitis. All of these diseases interfere with their work (Krapac and Jajić, 1983; Krapac *et al.*, 1990; Krapac *et al.*, 1992; Krapac *et al.*, 1995; Krapac *et al.*, 2001; Vodanović *et al.*, 2009; Grubišić *et al.*, 2009).

CASE REPORT

D. P. (45), is a violinist member of the prestigious orchestra in Zagreb - Croatia. In the fall of 2017, due to the pain in the elbows, expressed on the visual analogy scale (VAS right 5/10 and left 6/10), he was treated at orthopedist, followed by physical therapy. He started to work at the end of 2017. Because of the extremely severe pain (VAS 9/10) of left elbow he interrupted his work and checked into the NADO Polyclinic in Zagreb at the beginning of the 2018. Clinical examination, measurements of pain in VAS, estimation of Oswestry index has been performed. Thermographic imaging, using a thermovision camera embedded in the CAT S 60 smartphone (E moded FLIR apton camera), verified strong inflammatory reaction in the right elbow, but more pronounced in the left elbow. Swelling, but also tenosynovitis of the extensor left forearm muscles has been shown (Fig. 2) The mechanical dynamometry also recorded the reduced force of the hands

(right = 60kg, left = 50kg). After 10 daily therapies in the Polyclinic NADO (locally one Infiltration of Depo Medrol 40 mg, 5 electroanalgesic TENS, 5 decompression traction of the cervical spine) we recorded a decrease in VAS pain from 9 to 5/10. By using the CAT smartphone we verified the decreased temperature of the left forearm - tenosynovitis as a consequence of "overuse syndrome" caused by violin playing. D. P. is now a successful violinist, playing in orchestra with mild pain in both elbows (VAS 3/10) but with minimal inflammatory reaction of left lateral epicondyl, verified by thermography (Fig. 3).



Figure 1.

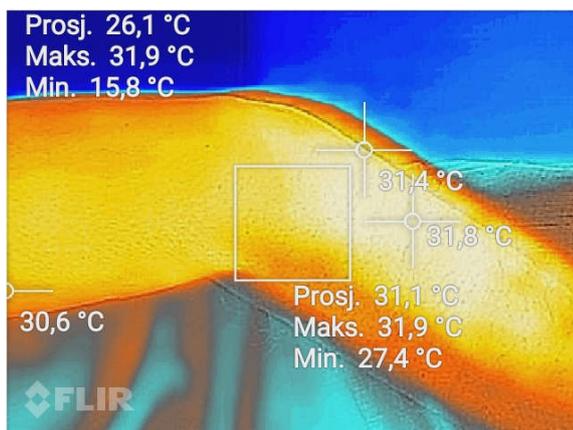


Figure 2.

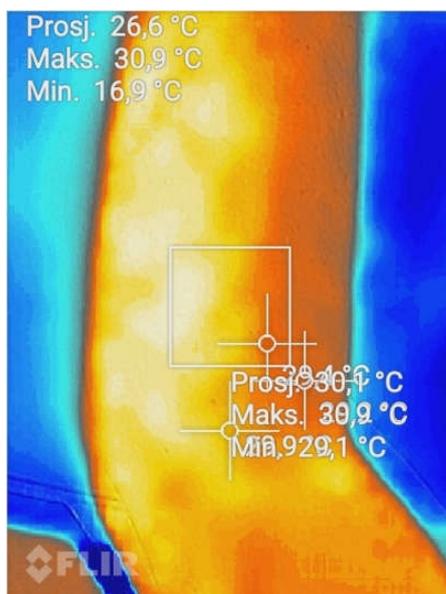


Figure 3.

DISCUSSION

Measurements during physical therapy and rehabilitation process are considerable contribution to the patient and therapist cooperation, better compliance and persistence. Electrodiagnostics, advanced dynamometry, ultrasound technology in diagnostics, life quality tests (Oswersty index etc.) help us greatly. Thermography (TG) has been introduced as a diagnostic tool in rheumatology approximately 35 years ago (Vujčić, 1989). The high price made it more difficult to apply it then. Technological progress has now made it easy and economically acceptable use of TG via a smartphone with a FLIR camera. By elaborating the TG application process, while respecting the thermal environment during measurement (the desired temperature of the environment between 50 and 75 F), we will confirm the credibility of non-aggressive Physical and Rehabilitation Medicine procedures, as well as enable scientific monitoring and better interpretation of treatment results (Ring, 2012; Eddie, 2017). Performing artists, as a particularly sensible and vulnerable population, as well as IT professionals (3-7), can quickly perform scanning and secondary prevention of frequent discomforts and /or diseases of spine and upper extremities, and monitoring the effect of therapy. This paper was presented as a poster on the VII Congress of the Croatian Society for Physical Medicine and Rehabilitation, Solaris, Šibenik 19 to 22 April 2018 (Thermography in the Evaluation of the Tennis Elbow Treatment of a Violinist - case report, in Physical and Rehabilitation Medicine 2018).

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