

Infrared Thermographic Imaging in the Detection of Sympathetic Dysfunction in Patients with Patellofemoral Pain Syndrome

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ABSTRACT

Objective: This study investigates the clinical utility of infrared thermography in the detection of sympathetic dysautonomia in patients with patellofemoral pain syndrome. The patients exhibited anterior knee pain, radiographic evidence of patella alta and the clinical signs and symptoms of patellofemoral pain syndrome.

Design: A case control study was carried out with two groups of patients: patients with anterior knee pain, and patients with no knee pain as a control

Setting: Private practice.

Patients: Group 1 consisted of 30 patients with patellofemoral pain syndrome. Group 2 consisted of 40 control patients with no history or presence of knee pain. Control patients were consecutively selected, and the knee pain patients were consecutively selected from a population-based sample.

Outcome Measure: Infrared thermography scans were obtained on the knee pain patients and control patients to determine the sensitivity and specificity of

infrared thermography for detecting patellofemoral pain syndrome.

Results: Twenty-nine of the 30 knee pain patients in group 1 had patellar thermal asymmetry from right to left sides (sensitivity 97%). Thirty-six of the 40 control patients exhibited thermal symmetry from right to left sides (specificity 90%). The incidence of patellar thermal asymmetry was found to be statistically significant when tested by χ^2 analysis ($p < .001$).

Conclusion: Infrared thermography appears to be a useful, noninvasive diagnostic test in the diagnosis and management of patellofemoral pain syndrome. The high incidence of patellar thermal asymmetry and dysautonomia at the patella in patients with patellofemoral pain syndrome implicates somatosympathetic mediation in this disorder. This may be helpful in understanding the evolution of patellofemoral disorders. (J Manipulative Physiol Ther 1992; 15:164-170).

Key Indexing Terms: Infrared Thermography, Sympathetic Nervous System, Patellar Pain, Chiropractic.

INTRODUCTION

Patellofemoral pain syndrome (PFPS) is one of the most common problems that afflicts competitive and recreational athletes. Anterior knee pain is a common symptom seen in runners and athletes and is not uncommonly seen in patients involved in motor vehicle accidents. Many etiologies of PFPS have been suggested, including abnormal patellar tracking, malalignment, contusive trauma, subluxation and a weak or imbalanced extensor mechanism. Chondromalacia patellae is a common label given to this disorder; however,

this is controversial since many patients with anterior knee pain do not exhibit chondral degeneration upon arthroscopic examination (1). The diagnosis of PFPS is often clinically based on the patient's report of symptoms and positive orthopedic testing (i.e., patellar grind, apprehension and compression tests). Radiographic evaluation is sometimes helpful with skyline (sunrise view) and lateral images used to note evidence of patella alta. However, there is no single definitive diagnostic test for PFPS. The purpose of this study was to demonstrate the sensitivity and specificity of infrared thermography in the diagnosis of PFPS and to propose a mechanism for the development of chondromalacia.

The patient will typically complain of anteromedial, peripatellar or retropatellar pain. Ascending or descending stairs will cause more discomfort, as will sitting for prolonged periods ("cinema sign") (2, 3). The pain is

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Paper submitted November 30, 1990.