

Case Report and Brief Review: A Puzzling Case of Leg and Ankle Swelling

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ABSTRACT

Here we present the case of a medical student in his twenties who had experienced episodes of heat edema that had been previously evaluated at other EDs and had been thought to be from a DVT etiology, with consecutive negative ultrasound studies. An awareness of heat edema as a minor heat-related illness is important in order to avoid unnecessary testing and in order to help prevent future episodes.

Keywords: Heat Illness, Heat Edema, Environmental Illness.

INTRODUCTION

Heat edema is a mild dependent edema that represents on the mild or minor forms of heat related illness—the other two being exercise associated muscle cramps (heat cramps) and miliaria rubra (heat rash). It occurs in the non-acclimatized individual.

CASE PRESENTATION

A medical student in his twenties presented to the Emergency Department (ED) with a history of bilateral lower leg edema of a six hour duration. He reported that he had attended a music festival and had been standing in 90 degree F plus weather for 8 hours. He reported that this had happened before on two occasions and that he had presented to two different EDs where he underwent ultrasound studies of the lower extremities and unspecified lab work. He recalled that an ultrasound study of his lower extremities was negative for deep vein thrombosis (DVT) on both occasions. He stated that he had been told that he probably had ultrasound negative and had been advised on both occasions to have a repeat ultrasound 6 days after discharge. His symptoms resolved within 24 hours on both occasions and he did not follow up for repeat ultrasound studies. It appears that the ultrasound studies were done despite negative d-dimer testing, but that the clinical suspicion of DVT was felt to warrant the ultrasound testing. He denied shortness of breath. He denied any medications or significant past medical or surgical history.

On physical exam, he was noted to have 2 plus pitting edema of his bilateral feet and ankles with no tenderness. There was no calf tenderness. Bilateral lower leg swelling was noted. The remainder of his

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physical examination was negative. Vital signs were within normal limits, including a normal temperature. A d-dimer test was negative. A presumptive diagnosis of heat related pedal edema was made. No ultrasound testing was done. He appeared mildly dehydrated. He received a liter of saline.

He was discharged with follow up with primary care if the swelling did not resolve. He was advised to take breaks from standing in hot weather and not to stand more than 2 hours. It was recommended that he bring a portable chair to such concerts in the future. He was advised to lie down with elevated legs for six hours. At telephone follow-up at 48 hours, the patient reported that the swelling resolved within six hours of rest and leg elevation.

DISCUSSION

Heat edema is a mild dependent edema that represents on the mild or minor forms of heat related illness—the other two being exercise associated muscle cramps (heat cramps) and miliaria rubra (heat rash). Seto places heat tetany in this group of minor heat related illnesses [1]. It occurs in non-heat-acclimatized individuals [2]. The body temperature is normal by definition in the minor heat related illnesses [3]. The mechanism is increased plasma volume that occurs in response to the heat along with dependent edema forces. There is vasodilation with associated increased interstitial fluid. As acclimatization occurs, as in a runner who trains in warm weather, less plasma volume increases are seen [4]. The management is with rest and elevations of the legs. Diuretics have no role in treatment [5]. The primary risk factor for pedal edema is a lack of acclimatization to warm weather. However, diabetes mellitus and renal disease can be predisposing factors as can underlying heart disease.

It is noteworthy that heat edema can occur in any gravity dependent area including the hands. Some non-acclimatized runners will experience edema of the hands as well as the lower legs.

CONCLUSIONS

Heat edema is a mild dependent edema that represents on the mild or minor forms of heat related illness—the other two being exercise associated muscle cramps (heat cramps) and miliaria rubra (heat rash). An awareness of heat edema as a minor heat-related illness is important in order to avoid unnecessary testing and in order to help prevent future episodes.

CONFLICT OF INTEREST

There was no funding related to this case report. The authors declare that they have no conflicts of interest.

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