

Secondary infection with *Streptococcus pyogenes* can trigger acute poststreptococcal glomerulonephritis and rheumatic fever.<sup>5,6</sup>

The exact pathogenic mechanism associated with the organisms isolated in skin lesions with secondary infection has not yet been determined. In our case, the pathogenic role of *S aureus* was clear, as it was isolated in the blood, the pleural fluid, and the skin lesion. Thus the parasite entered the epidermis through a break in the skin leading to bacteremia and the consequent empyema.

Early diagnosis of scabies is essential in order to initiate appropriate treatment with a scabicide. Similarly, secondary bacterial infection must be managed through local or, occasionally, systemic antibiotics, and pus must be drained from abscesses<sup>3</sup> in order to avoid complications that could potentially endanger the life of the patient.

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# Eruptive Xanthomas After Onset of Diabetes Mellitus

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## To the Editor:

We recently treated a 33-year-old man who was admitted to our hospital with abdominal pain accompanied by nausea, vomiting, and hyperglycemia that had begun 4 days earlier and reflected the onset of diabetes mellitus. The patient had a history of hypertension diagnosed in the last 3 months, predominantly abdominal obesity, with a body mass index of 31.5 kg/m<sup>2</sup>, severe alcoholism, and hypercholesterolemia diagnosed a year ago. He was receiving dietary treatment. The patient's father had

type 2 diabetes mellitus that began in his thirties.

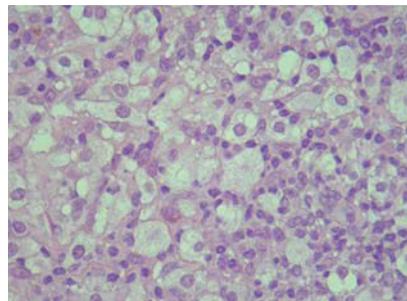
The patient reported polyuria, polydipsia, and polyphagia for the last 3 weeks, along with weight loss of 10 kg. Around that time, he began to develop erythematous papules of 1 to 4 mm in diameter on his back, and these turned yellow within a few days. Some of the lesions had a peripheral halo and were accompanied by mild pruritus. The lesions were initially distributed on the back but later spread to the arms and legs, buttocks, and in particular, the sacral region (Figure 1).

Laboratory analysis during admission revealed the following: glucose, 257 mg/dL; total cholesterol, 418 mg/dL; triglycerides, 853 mg/dL; high-density lipoprotein cholesterol, 32 mg/dL; low-density lipoprotein cholesterol, 218 mg/dL; direct bilirubin, 0.1 mg/gL; indirect bilirubin, 6.1 mg/dL; aspartate aminotransferase, 18 mU/mL; alanine aminotransferase, 20 mU/mL;  $\gamma$ -glutamyltransferase, 66 mU/mL; lactate dehydrogenase, 398 mU/mL; and alkaline phosphatase, 230 mU/mL. Gasometric analysis of venous blood revealed slight metabolic acidosis. Thyroid function, insulinemia, and C-peptide concentrations were within normal ranges and analysis of anti-islet cell antibodies was negative.

Abdominal ultrasound revealed diffuse hepatic steatosis with hepatomegaly. Histology of the skin lesions (Figure 2) revealed infiltration of the superficial and middle dermis by uniform polygonal mononuclear macrophages with a foamy cytoplasm, with a tendency toward perivascular aggregation and without accompanying



**Figure 1.** Multiple yellow papules with a peripheral erythematous halo on the back of the arm and the back.



**Figure 2.** Macrophages loaded with intracellular lipids (foam cells) (hematoxylin-eosin,  $\times 400$ ).

lymphocytes. There were no notable changes in the epidermis.

Following stabilization of the patient, treatment was initiated with a diabetic diet, insulin therapy, fenofibrate 160 mg/d in slow-release tablets, and metformin 850 mg every 12 hours.

A month and a half later, after the patient had lost weight, done regular physical exercise, and received medical treatment, the lesions had remitted, though some had left residual hypertrophic scars. Blood glucose and triglycerides had returned to almost normal levels (glucose, 111 mg/dL; triglycerides, 163 mg/dL).

Eruptive xanthomas are yellow or orange papules measuring only a few millimeters in diameter and generally with an inflamed base. They are distributed on the thighs, legs, and extensor surfaces the extremities. They can display a Koebner phenomenon<sup>1</sup> and are sometimes accompanied by pruritus and pain. The lesions usually remit within weeks and can heal leaving behind residual keloid scars. Foamy macrophages are observed by histology, accompanying a variable mixed infiltrate of lymphocytes and neutrophils.

The lesions can occur in the context of hyperchylomicronemia or hypertriglyceridemia as a result of abnormalities in lipid metabolism,<sup>2</sup> producing intracellular and extracellular lipid deposits. Most cases occur as a result of deficient lipoprotein lipase activity. This lack of lipoprotein lipase function occurs in situations of primary lipoprotein lipase deficiency (apoprotein CII abnormality, such as Frederickson type-1 hyperlipoproteinemia) or secondary to reduced insulin activity (eg, diabetic dyslipidemia) or hepatic overproduction of chylomicrons (Frederickson type-4 hyperlipoproteinemia or endogenous familial hypertriglyceridemia).

The hypertriglyceridemia associated with diabetes occurs via a dual mechanism. Firstly, there is a reduction in chylomicron clearance that leads to an increase in very low-density lipoproteins and, consequently, to hypertriglyceridemia. Secondly, lipoprotein lipase requires minimum levels of functional insulin in peripheral blood, and lack of insulin activity or insulin resistance lead to acquired lipoprotein lipase deficiency. For that reason, some authors have proposed the term diabetic dyslipidemia.<sup>3</sup>

Diabetes is one of the most common causes of secondary hypertriglyceridemia. Other common causes include liver cirrhosis, hypothyroidism, and pancreatitis. Eruptive xanthoma has been described less often in cases of hypothyroidism, nephrotic syndrome, von Gierke disease, excessive alcohol consumption, chronic cholestasis,<sup>4</sup> treatment with systemic corticosteroids, estrogens, or retinoids, and generally with any processes that involve hyperlipidemia, whatever the underlying mechanism.

Differential diagnosis should include disseminated, tendinous, and tuberous xanthoma, eruptive histiocytoma, granuloma annulare, juvenile xanthogranuloma, molluscum contagiosum, and necrobiotic xanthogranuloma.<sup>5</sup> Hypertriglyceridemia should always be ruled out in cases of eruptive xanthoma, along with the possible association with diabetes mellitus, because eruptive xanthoma can sometimes form part of the initial presentation of the disease, as in our case.<sup>6</sup> Even with a presumptive diagnosis of eruptive xanthoma, biopsy is advisable, since cases of histiocytosis can appear similar.<sup>7,8</sup>

Adequate treatment requires rigorous control of the underlying hyperlipidemia. This requires a diet low in fats and rapidly absorbed carbohydrates, as well as

reduction of weight and regular physical exercise, particularly in patients with insulin resistance.<sup>9</sup>

In summary, eruptive xanthomas may be associated with diabetic dyslipidemia, not just with hypertriglyceridemias, and with a complete accompanying metabolic syndrome that may require urgent medical treatment.

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