A LEUKOCYTOCLASTIC VASCULITIS SUCCESSFULLY TREATED WITH HYPERBARIC OXYGEN: CASE REPORT

Abstract

We present the case of 27 year old female suffering from non-healing, recurrent, painful ulcers on left lower leg, precipitated by minor trauma, and resulting from underlying cutaneous leukocytoclastic allergic vasculitis.

After two years of conventional systemic therapy and aggressive topical wound care she was presented to Division of hyperbaric oxygen therapy. A hyperbaric oxygenation was applied as monotherapy. After 40 sessions a complete regression of all skin defects was realized. Several previous good experiences and this evidently successful treatment encourage us to advocate the hyperbaric oxygen as mono or adjuvant therapy for such hard-to-treat problem.

Key words*: hyperbaric oxygenation; leukocytoclastic vasculitis; cryoglobulinemia, leg ulcers; limb ischemia*

Leukocytoclastic vasculitis (LCV) is the most frequent form of cutaneous vasculitis There is always an exogenous (infections, drugs, chemicals, foodstuff allergens) or an endogenous (malignant neoplasm, connective tissue disease) trigger.

A pathogenesis of LCV is immune complex form related. Laboratory examination should reveal a mixed cryoglobulinemia type III referring to the presence of polyclonal immunoglobulins in the serum. Deposits within the small- and medium-sized vessel walls leading to complement activation, intravascular and perivascular fibrin deposits, subsequent tissue hypoxia and necrosis can be observed. Erythematous macules and palpable purpura occurring on lower legs are usually observed. The lesions, ranging in size from pinpoint to several centimeters, may progress from papulonodular, vesicular, bullous, pustular, to ulcerative. Progression of LCV leads to ischemic lower limb, which eventually necessitates a surgical approach, including debridement, removal of necrosis, sympatectomy and amputation at the end stage.

We report a patient who suffered for 2 years from persisting non-healing problem wounds, after a minimal traumatic damage of inner side her left ankle. She recovered completely only after HBO therapy was applied. In this article the role of HBO as mono therapy is emphasized.

Case report

A 27-year-old woman was presented to the Department of Anesthesia and ICU, division for hyperbaric oxygen therapy (HBOT) with a history of recurrent painful ulcers on left lower leg. Two years before she refereed a minor trauma on the medial aspect of the left ankle in the form of small laceration, which later turned to inflamed area, and a tender, irregular 1.5-2 cm ulcer surrounded with palpable purpura. Histopathology findings referred to LCV. She had no history of allergic reactions. A direct immunofluorescence demonstrated cryoglobulinemia type III, not related to viral hepatitis infection type C or type B. At late stage of disease, there were signs of secondary sideropenic anemia (serum Fe 4 μmol L-1). According to isolated microorganisms (*Staphylococcus aureus, Pseudomonas aeruginosa, Enterobacter* sp.) she was given antibiotics: amoxicillin with clavulonic acid, cloxacillin, trimethoprim-sulphomethoxazole, ciprofloxacin, klindamycin, gentamycin and finally sulfone, used as leprostatic. Corticosteroids, non-steroid analgesics, acetylsalicylic acid, and adjuvant therapy consisting of ranitidine, diosmin, hesperidin and iron derivatives were used too. At the end stage of treatment azatioprin, and warfarin were given, without any result. Local wound care included corticosteroid and antibiotic ointments, hydrocolloid dressing, hydrogen and normal saline compresses.

The ulcerations deteriorated over time despite the conventional therapy. The next step planed was surgical sympathectomy. As last decision, amputation of affected limb was considered.

Social and psychological factors superposed to her problem of non-healing wound. She became depressive, frustrated and anxious. She walked with crutches, could not sleep, could not work, was distressful and had suicide ideas.

On admission to the HBOT unit, she had several serpiginous ulcers with necrotic purplish edge and slough base. The surrounding skin was covered with polymorphic lesions consisting of areas of erythematous and purpuric papules, hyper pigmentation, brown crusts, and white atrophic scars (Figure 1). Clinical symptoms included swelling of the ankle and foot as well as pain estimated by visual analogous scale as grade 8.

These skin defects were complicated by bacterial infection and increased drainage from the wound. Her therapy on admission was gentamycin 160 mg IM day-1 and

methylprednisolone 8 mg day-1.All ulcers were precisely measured and photographs were taken in order to accurately register a course of the treatment.

Based on clinical statements and histological examination of LCV, a decision was made to stop all parenteral and oral therapy. The HBO as mono therapy at regime 2.2 bar (223 kPa), 60 minutes day-1 was applied. The wound was dressed with moist compresses of normal saline. After only three therapy sessions, a surprisingly early regression of ischemic pain was observed. Subsequent therapy sessions resulted in the rapid healing of migrating ulcers and regression of edema.

After 40 HBOT a complete regression of skin lesions and good leg function were realized. Cryoglobulins were no longer detectable in the patient's plasma. (Figure 2). One year after the treatment she has no recidive changes.

Discussion

Local hypoxia and infection are the primary underlying in non-healing problem wounds (compromised diabetic foot, ischemic ulcers with underlying cutaneous vasculitis, venous ulceration, and radiation necrosis). In LCV a differentiation between disease-related and treatment-induced leg ulcers is always difficult and sometimes may not be possible. Cessation of the drug typically leads to wound healing in this hypersensitivity disorder. HBOT is defined as a mode of medical treatment in which the patient breathes 100% oxygen intermittently at a pressure greater than one atmosphere (101,33 kPa), (at last 1.4 or 3 atmospheres) (142 or 304 kPa). It increased partial pressure of oxygen in all the tissues of the body, mostly by increasing a dissolved fraction of oxygen in the blood. An increase in the oxygen diffusion gradient between blood and tissues enables satisfactory oxygenation in the low perfused tissue. The beneficial effects are: wound healing enhancement; increased neutrophil bactericidal capacity; direct toxic effect against some micro organisms; arteriolar vasoconstriction with subsequent edema reduction, collagen synthesis, and process of neovascularization in ischemic tissues.

Complications of HBOT are related to pressure changes and referee to middle ear barotraumas, sinus pain, pulmonary barotraumas, oxygen seizures, decompression sickness and claustrophobia.

HBOT is currently accepted as the primary therapy in patients with carbon monoxide poisoning, decompression sickness, and arterial gas embolism. HBOT is also indicated in radiation-induced tissue injury, thermal burns, and acute traumatic ischemia, compromised grafts and possibly ischemia and reperfusion (I/R) injury.

Opportunity to apply HBOT as mono therapy, together with stopping the application of possible exogenous causes of LCV (infection, drugs, chemicals and foodstuff allergens) resulted in the excellent overall response: the cryoglobulins disappeared, as did the clinical symptoms. One year after HBOT a patient has no recidive changes.

Many recent case reports indicate the HBOT may be useful technique in the management of problem wounds precipitated by hypoxia and/or infection. A presented case should encourage clinicians to use HBO as mono therapy in the treatment of non-healing painful ulcers resulting from underling cutaneous LCV. High-quality randomized controlled prospective trials are needed to evaluate the short-and long-term risks and benefits of HBOT.

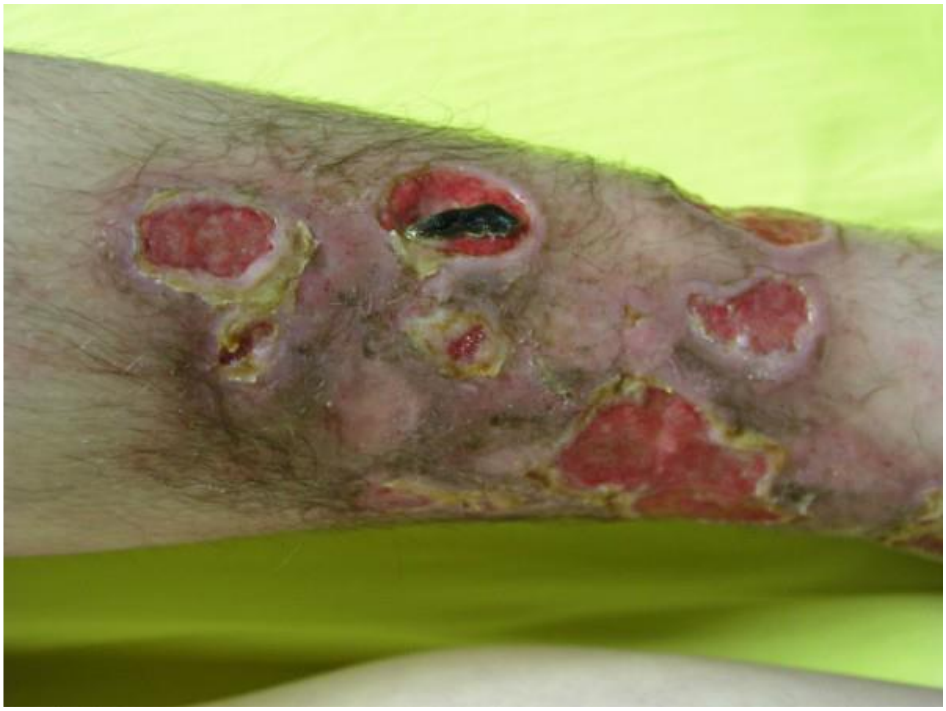

Figure 1. Before HBOT: heterogeneous lesions from "palpable purpura", as clinical hallmark of early LCV, to the painful, swelling, ischemic limb, with deep, suppurating, stinking ulcers.

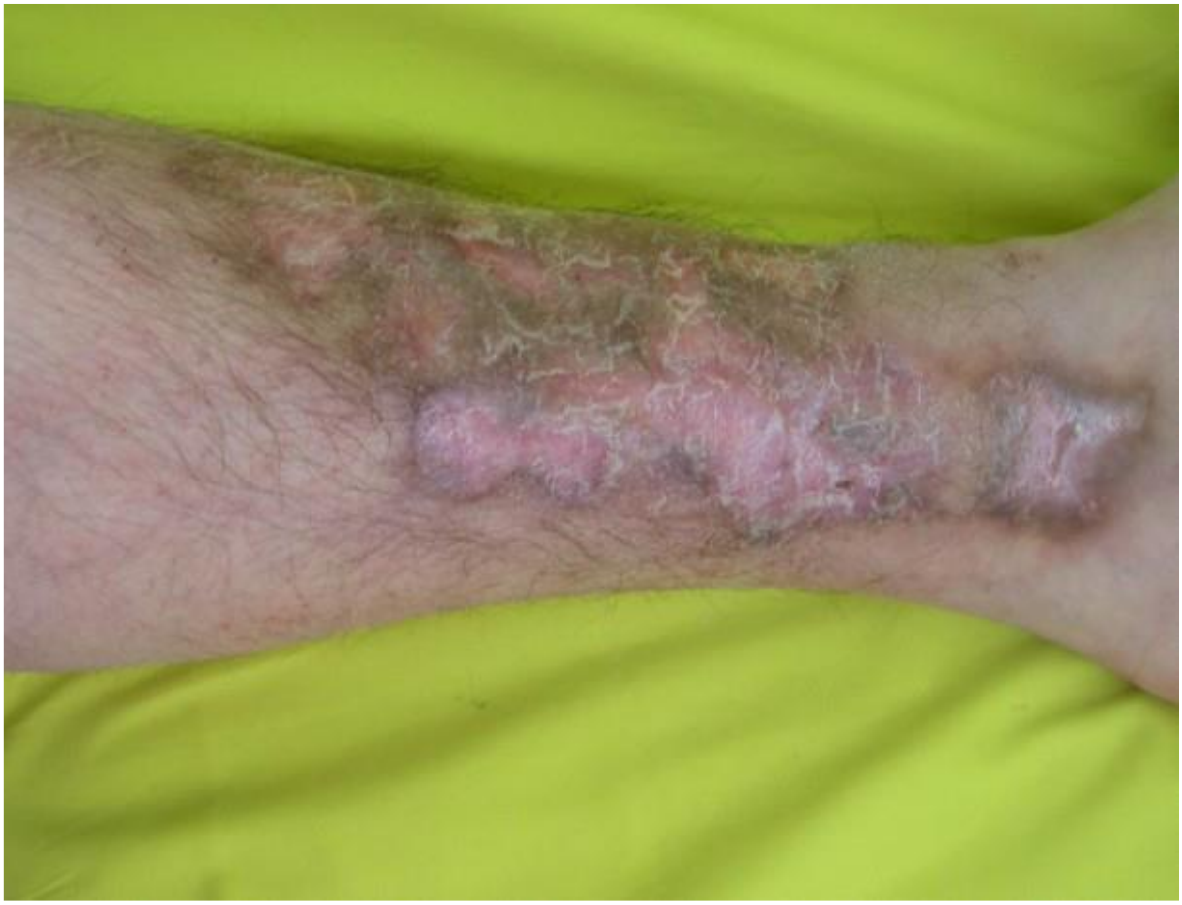

Figure 2. After 40 HBOT sessions: white scars and hyperpigmentation persisted over the intact surface of affected lower leg.