
Clostridial Myonecrosis (Gas Gangrene)

Hyperbaric oxygen (HBO₂) therapy is an adjunct to surgery and antibiotics for the treatment of clostridial myositis and myonecrosis (gas gangrene) and spreading clostridial cellulitis with systemic toxicity, or a presumptive diagnosis of either.

Treatment should be started without delay because less surgery needs to be performed and the cessation of alpha-toxin production is rapid.

RATIONALE: Ninety percent of the cases of gas gangrene are caused by the organism *Clostridium perfringens*. However, a number of pathogenic clostridial organisms may be involved. These organisms produce necrotizing tissue toxins. *Clostridium perfringens* is not a strict anaerobe; it may grow rapidly in oxygen tensions of up to 30 mmHg and in a restricted manner in oxygen up to 70 mmHg.

Restricted growth and a halt in alpha toxin production is evident at tissue oxygen tensions above 250 mmHg (remember, at 3 ATA, tissue O₂ levels above 300 mmHg). Ideally, HBO₂ therapy should be started early and continued until progress of the anaerobic infection is completely halted. It is recommended that a patient with gas gangrene receive three treatments in the first 24 hours, then two treatments daily for the next 4 to 5 days. HBO₂ must be continued on the basis of clinical impression and gram stain results without delays for bacterial confirmation. Elevation of oxygen tension in the region of functioning capillaries in the infected wound halts alpha toxin production, and necrotic tissue can be debrided more conservatively salvaging more viable tissue than would otherwise be possible. Although surgery and antibiotics remain the primary treatment, the need for emergency life saving ablative surgery is often avoided as HBO₂ effects a chemical barrier to progression of disease. Major clinical studies indicate that the lowest morbidity and mortality are achieved with initial conservative surgery and rapid initiation of HBO₂ therapy. Results decline progressively when HBO₂ therapy is delayed. Early aggressive surgery and delayed HBO₂ treatment lead to a significantly higher mortality and morbidity than when HBO₂ is administered promptly.

Source: *Hyperbaric Oxygen Therapy: A Committee Report*. Undersea and Hyperbaric Medical Society. 1996 Revision.