Gas gangrene

A patient's history from an OR nurse's perspective Part 2

By Diane Aboud, R.N. and Jan Williams, R.N.

Recently, at the Riverside Hospital in Ottawa, an active treatment community hospital of 274 beds, the operating room encountered a case of gas gangrene in a young female patient. The case touched the entire operating room nursing staff, most of whom are mothers with teenage daughters. We were all shaken by the fact that the patient was also in her teens.

To help us understand this infection (gas gangrene) and to work through our grief at what was happening to this patient, we assiduously undertook the task of being well informed about gas gangrene and the events that lead up to the surgery that our young patient had to endure.

Before her first admission to our hospital, Lianna (not her real name) had been a normal, healthy, active and sports-minded teenager. She had been ill with cramps and diarrhea for a month. She had been treated with Imodium, which was discontinued as it made her vomit.

She was sent to the Emergency Department by her family doctor in mid-March, 1990, with a diagnosis of diarrhea and anemia. She was very pale and weak on admission and had lost ten pounds in one month.

Her haemoglobin was 8.0 g/dl (normal is 12-16 g/dl). She was typed and cross-matched, transfused with blood and the investigation into her illness was initiated.

A sigmoidoscopy and biopsy were done, which were found to be normal. A chest x-ray and ultrasound found nothing out of the ordinary. Blood and stool cultures showed no abnormalities or growth.

A barium enema and colon air contrast studies showed extensive deep mucosal ulceration involving the cecum, ascending, transverse and descending colon. A preliminary diagnosis of Crohn's disease was made.

She was discharged home two weeks later and was prescribed Prednisione and six Mercaptopurines and was to be followed by her family physician. At home, her diarrhea improved, but her haematological status worsened.

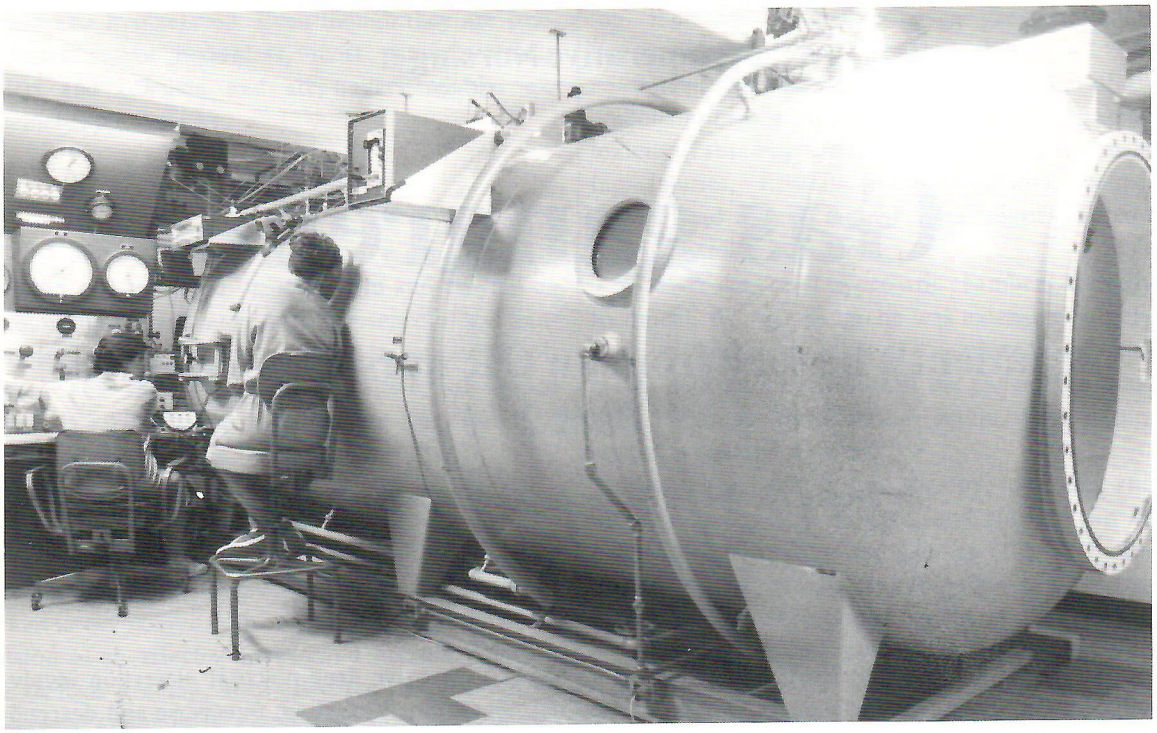
Crohn's Disease

Lianna was re-admitted twenty-four hours after her discharge on April 24, 1990, with a diagnosis of Crohn's disease and profound anemia. Her haemoglobin was 5.5 g/dl. She was weak, pale, tachycardiac and febrile.

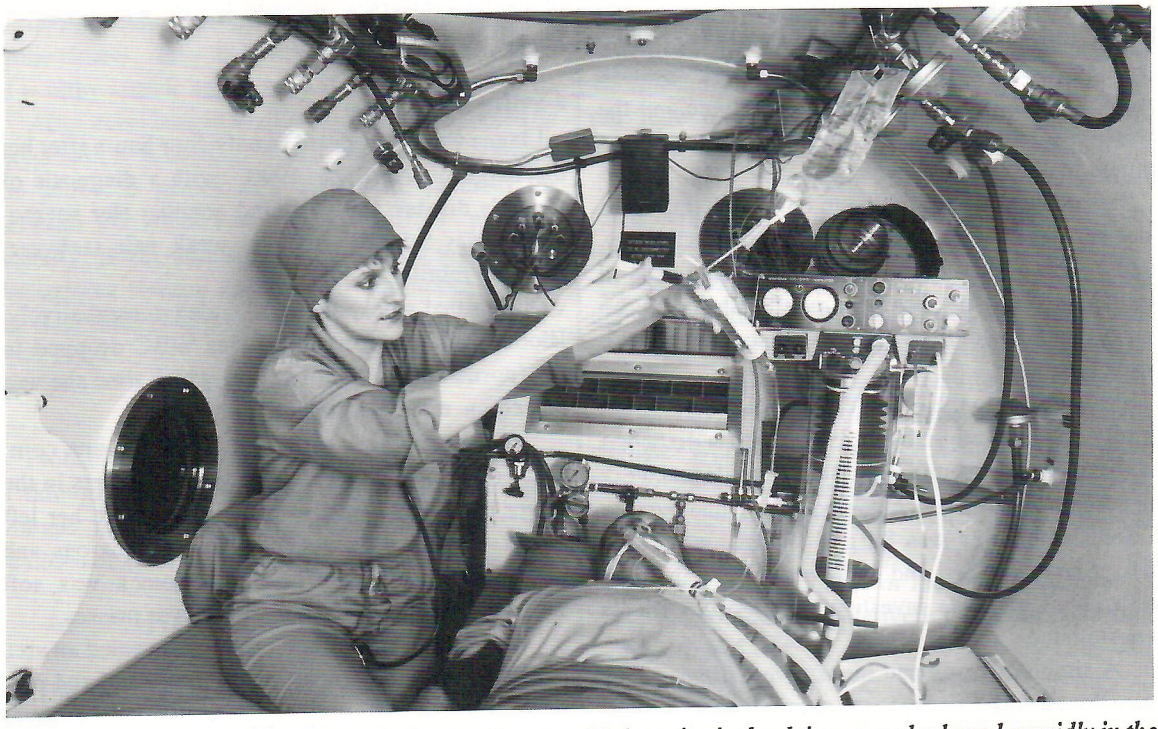
During that week, she was treated conservatively. Blood work was done daily. Her WBC dropped to 0.9 (normal being 4.0 - 11.0), at which time she was placed on reverse isolation.

On the morning of May 1, 1990, Lianna complained of pain in her left thigh, numbness in the lower extremity, and an inability to move her left ankle. Examination revealed a pale, anxious and distraught young women. Her abdomen was soft with no distention and no tenderness or masses.

An examination of her left thigh revealed an area of bluish-purple discoloration on the medial and posterior skin surfaces, with swelling in the middle one-third of the thigh. There was obvious crepitus and extreme tenderness on palpation. The knee jerk reflex was preserved, but the ankle jerk was absent, and she



Hyperbaric oxygen therapy is an outgrowth of diving medicine. Over the decades, the treatment of divers, compressed air workers and eventually aviators was refined. Experimentation with oxygen breathing under pressure eventually led to the realization that oxygen was the breathing gas of choice. Oxygen therapy under pressure had other applications and hyperbaric therapy came into its own. Acute Ischemia, Gas Gangrene, Carbon Monoxide Poisoning, Gas Embolism and Compromised Wounds are other conditions treated.



Gas Gangrene is caused by a bacteria that produces multiple toxins in dead tissues and rebreeds rapidly in the absence of oxygen. Hyperbaric oxygen therapy results in the cessation of toxin production, which is life saving. Photos show the interior and exterior of the monoplace hyperbaric chambers at The Toronto Hospital.

had no sensation from the level of her knee down. Leanna was unable to planter flex or dorsal flex her feet.

A diagnosis of gas gangrene with an involvement with the sciatic nerve was made. This diagnosis was made by the general surgeon called in for a consultation. Intravenous antibiotics (Pipercillin - 2G, Gentamycin - 80mg, and Flagyl - 500 mg) and morphine were given stat and the patient, who by now was in septic shock, was rushed to the operating room. Although only semi-conscious, Lianna was extremely apprehensive.

After intubation, a double lumen C.V.P. catheter was inserted by the anaesthetist in the right internal jugular vein. In addition, an arterial line was established.

After the incision was made, (a long vertical cut on the posterior-medial border of the thigh) a foul odour was noted. The entire posterior and medial compartment muscles were bluish-black in color and were totally necrotic, with a large amount of crepitation. The deep fascia was also necrotic. Gas gangrene was the confirmed diagnosis.

The gracilis adductor longus and magnum muscles were debrided to expose the sciatic nerve. This nerve, from the pubic area to the knee, was surrounded by necrotic fatty tissue. There was crepitation along the anterior aspect of the thigh as well.

After consulting with two orthopaedic surgeons and another general surgeon, a mid-thigh amputation was done with further extensive debridement of the medial compartment. Drains were placed and part of the skin incision was closed. The rest of the incised area was packed open with idioform gauze.

The patient was then transported to the ICU. The surgical pathology report confirmed gas gangrene in the tissue of the leg amputated. The blood cultures done on May 1 incubated *Clostridium septicum.*

A decision was made that evening to send Lianna by air ambulance to Toronto where a hyperbaric oxygen therapy chamber was deemed necessary to stop the growth of the Clostridium.

The next day, a total colectomy (for extensive Crohn's disease) was done. This left her with a permanent ileostomy. After a two week stay in Toronto, she was transferred by air ambulance to the pediatric hospital in Ottawa.

Clostridium was again being cultured a week later and she was returned to Toronto where she received two more treatments in the hyperbaric chamber.

Again she was transferred back to Ottawa for convalescence and rehabilitation.

It has now been five months since we had Lianna in our OR. She appears to be on her way to a complete recovery. She has adjusted well to her ileostomy and is comfortable in looking after it. Her stump from the amputation is still healing and when it has completely healed, she will be fitted for a prosthesis. In the meantime, she is mobile on crutches, is back in school and plans on attending university next fall. ■

Bibliography

1. Braude, A.I., M.D., Ph.D., "Infectious Diseases and Medical Microbiology," W.B. Saunders Company, Toronto; 1986.
2. Wyngaarder, James B. and Smith, Lloyd, "Textbook of Medicine," W.B. Saunders Company, Toronto;1988.
3. Robbins, Slantry, Cotran, Ramzi, "Pathological Basis of Disease," W.B. Saunders Company, Toronto.
4. Nurses Reference Library, Nursing '81 Books, "Diseases," Intermed Communications Ltd., Philadelphia, PA.
5. "The Uses of Oxygen Under Pressure," Emergency Medicine, 86 Man 15: 18(5): 33-48.

Crohn's Disease

Crohn's Disease is an inflammation of any part of the G.I. tract (usually terminal ileum), which extends through all layers of the intestinal wall. The exact cause is unknown, but possible causes include allergies, and other immune disorders, lymphatic obstruction and infection.

Whatever the cause of Crohn's disease, lacteal blockage in the intestinal wall leads to edema, and eventually to inflammation, ulceration, stenosis and abscess with fistula formation.

About the authors

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