

with naloxone (4 mg) had no effect. Because of the laser surgery, systemic air embolism was suspected. Lack of improvement after 1 h of 100% O₂ ventilation guided the decision to use hyperbaric oxygen therapy with only a presumptive diagnosis of cerebral air embolism. The initial compression up to 4 atmospheres resulted in progressive awakening with return to normal consciousness. The patient was successfully extubated 2 h later and returned home on the next day.

Lack of focal neurological signs made a pre-operative intracerebral process or pre-operative bleeding unlikely. The persistence of anesthetic drugs' effects was excluded. The duration of pre-operative oxygen desaturation was too short to lead to a post-anoxic coma. Direct signs such as provided by fundoscopy or CT scan or indirect signs such as measured by capnography were lacking [4]. However, the dramatic improvement after hyperbaric oxygen therapy indirectly supported the diagnosis [3, 4]. Venous air embolism is a well known but rare complication of laparoscopic and hysteroscopic laser surgery [1]. Only two cases have been reported after endotracheal laser surgery [2, 3]. In the first case, postmortem examination revealed a laser created fistula that connected a mainstream bronchus with a branch of a pulmonary vein [2]. In the second case, intraoperative arrhythmia and neurological deficit at awakening were reported [3]. The passage of air into the veins promoted by positive-pressure ventilation during the resection of a highly vascularised tumor was hypothesized [3]. In the present case, the positive direct pressure during assisted ventilation but also the negative intrathoracic pressure resulting from spontaneous breathing [5] together with the high flow (5 l/min) coaxial air-cooling may have promoted air passage.

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Clostridium septicum primary myonecrosis related to cecal neoplasia

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Sir: Primary myonecrosis is a devastating infection that is usually associated to hematologic or intestinal malignancy, being caused frequently by *Clostridium septicum* [1]. We present a case of a 54-year-old female patient, diagnosed with cecal adenocarcinoma, that suffered septic shock due to primary myonecrosis by *C. septicum*. This patient had a two-month history of abdominal pain, constipation, vomiting and weight loss. Colonoscopy documented a cecal adenocarcinoma. Awaiting surgery, the patient suffered two episodes of phlebitis in both upper limbs after venous cannulation, with intense pain and erythema. Twenty-four hours later, she developed hypotension, oliguria and obtundation. The upper limbs had purplish-blue tumefaction, subcutaneous crepitation, intense edema and lack of pulse. The patient was admitted to the Intensive Care Unit with the diagnosis of

septic shock associated with primary myonecrosis. During surgical debridement, muscle tissue was found to be edematous, friable and with putrid serosanguineous exudate. The hemodynamic study (Swan-Ganz) showed: cardiac index, 3.7 l/min/m²; pulmonary artery wedge pressure, 1 mmHg; systemic/pulmonary vascular resistance index, 627/108 dynes/cm⁵/m²; oxygen delivery/consumption, 496/190 ml/min. Upper limb X-rays showed gas in muscle planes (Fig. 1). She was treated with antibiotics and vasoactive drugs, achieving initial hemodynamic stability. Hyperbaric oxygen therapy was not available. The patient later developed a compartment syndrome, needing surgery again. Renal and hematologic failure appeared (clearance, 12.7 ml/min; platelets, 10000/μl), with severe rhabdomyolysis (myoglobinemia, 67400 ng/ml (N < 90), and myoglobinuria, 612000 μg/24 h (N < 50)). Multiorgan failure progressed, with death 4 days later. *C. septicum*, *Xanthomonas maltophilia* and *Staph. hominis* were isolated from blood cultures. The wound exudate showed



Fig. 1 X-ray of upper limb showing gas in muscle planes

Gram positive bacilli, without leucocytes, isolating *C. septicum* and *Staph. epidermidis*. The lack of leucocytes and *C. septicum* isolation were also observed in the following samples.

Primary myonecrosis presents with three types of lesions [2, 3]: a) visceral anaerobic cellulitis (VAC), with sepsis, b) VAC, with spreading to adjacent muscles and c) metastatic myonecrosis, of extremely poor prognosis [4] and present in our case. It is a devastating infection, generally appearing in patients with digestive or hematologic malignancy, and caused by *C. septicum* in 60–80% of the cases [1]. *C. septicum*, an aerotolerant, motile and spore forming organism, is an infrequent pathogen (1.3–20% of clostridial infections) [2, 4–6] and is not a normal inhabitant of the gastrointestinal tract. It is 300-fold more virulent than *C. perfringens* [1] due to its toxins: α toxin (lecithinase), two hemolysins, deoxyribonuclease, hyaluronidase and fibrinolysin [2–4]. The portal of entry for bacteremia is usually through disruptions of bowel mucosa (72–88% of the cases) [1–5] in colorectal malignancy or “enterocolitis” in hematologic malignancy, due to leukemic infiltration, lack of neutrophils or chemotherapy [1, 4, 5]. It later colonizes and proliferates in tissues with favorable local factors [1], such as the bilateral phlebitis in our patient, releasing toxins that produce necrosis and edema [2]. Primary myonecrosis by *C. septicum* presents with: extreme pain of the affected muscles, erythema, hemorrhagic phlictenas and soft tissue crepitation, although it may not be specific sign [1, 4, 5], with the finding of gas in X-rays [2, 4]. Progression is rapid and mortality is high (67–100%) [1, 2, 4, 5], some cases developing multiorgan failure and death in less than 24 h [1, 3, 5]. Dermoeepidermic lesions shows Gram positive bacilli and a typical lack of neutrophils [1, 4], as in our case. This finding aided to differential diagnosis with streptococcal myonecrosis, pyomyositis and synergistic necrotizing cellulitis [4]. Incision of muscle may release large amount of gas and exudate, showing a pale, edematous muscle tissue that does not bleed or contract when cut [4, 6]. Poor prognosis factors are shock, hemorrhage, pneumonia, diminution of neutrophils and hemolysis [3]. Treatment should include antibiotics and surgery. The antibiotics of choice is penicillin [1, 4]; other suggested antibiotics are clindamycin, ceftriaxone, cefoxitin, erythromycin, vancomycin, tetracycline, chloramphenicol, metronidazole and rifampin [1, 4]. Surgery ranges from debridement to amputation, but is always associated to antibiotic therapy [2, 4]. Hyperbaric oxygen therapy can be adju-

vant [1] but its efficacy has not been demonstrated [1–4].

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Principles and Practice of Mechanical Ventilation. M. Tobin. New York: McGraw-Hill 1994. 1300 pp. (ISBN 0-070-64943-X).

Martin Tobin, also editor of this journal, just produced for McGraw-Hill, Inc., publishing company, the most recent and comprehensive book on mechanical ventilation.

This big volume – 1300 pages – with a forty page-index, thousands of references and hundreds of figures, tables and photos, provides the best presently available update on mechanical ventilation, and actually on acute respiratory failure. The book goes from history (a nicely illustrated chapter by G.L. Colice) to the most recent concepts, such as microprocessing, barotrauma, and modes (PAV, pressure-controlled ventilation). It gives the basics of mechanical ventilation (gas exchange, heart-lung interaction, neuromuscular function...) and also answers very practical questions such as the strategy of weaning, the management of the airway, and patient-ventilator fighting. All the modes currently provided by ventilators are explained and compared on the basis of published reports and the experience of renowned experts.

It is a common pitfall of such big textbooks that they are already obsolete the very first day they are printed, due to the large number of authors – all very busy and very much in demand – and the quasi-impossibility for any editor to collect all the manuscripts in time. The miracle in this case is that all the newer concepts in the field are presented here, with no lack of relevant information, from barotrauma (D. Dreyfuss) and permissive hypercapnia (D. Tuxen) to healthcare economics (B. Krieger) and the ethics of withholding life-sustaining therapy (J. Luce).

I am also grateful to Dr. Tobin to have invited such a large number of European authors, who indeed have contributed to improve our knowledge in this particular field. Due to the comprehensiveness, balance and broadness, and also due to the quality of authors, this book will certainly remain a landmark in the field of mechanical ventilation and respiratory intensive care. It has to be recommended to all trainees and practitioners in ICUs, and should be available in any personal, departmental and university library.

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