A Fatal Case of Super-super Obesity (BMI >80) in a Patient with a Necrotic Soft Tissue Infection

Toshihiko Yoshizawa, Kouhei Ishikawa, Hiroki Nagasawa, Ikuto Takeuchi, Kei Jitsuiki, Kazuhiko Omori, Hiromichi Ohsaka and Youichi Yanagawa

Abstract:
A 35-year-old man (height, 169 cm; body weight, 240 kg; BMI, 84) visited the Department of Dermatology due to left leg pain and swelling. Focused enhanced computed tomography (CT) of the left leg ruled out complications of deep venous thrombosis. Surgical exploration of the left leg resulted in a diagnosis of necrotic soft tissue infection, but amputation was ruled out due to his weight. The patient ultimately died of multiple organ failure on the fourth day of hospitalization. A culture of the surgical material revealed Streptococcus dysgalactiae. The present case suggests that super-obese patients should be aggressively treated before lethal complications occur.

Key words: super-super obesity, cellulitis, Streptococcus dysgalactiae

1. Introduction

The World Health Organization Consultation on obesity defines the following body mass index (BMI) categories: underweight (BMI <18.5), normal weight (BMI 18.5-<25), overweight (BMI 25-<30), and obese (BMI ≥30). Obesity is subcategorized into the following grades: grade 1 (BMI 30 to <35), grade 2 (BMI 35 to <40), and grade 3 (BMI ≥40) (http://apps.who.int/bmi/index.jsp?introPage=intro_3.html). Flegal et al. performed a meta-analysis to calculate the hazard ratios (HRs) of all-cause mortality for overweight and obese individuals relative to individuals of normal weight in the general population (1). As a result, obesity (all grades) and grade 2 and 3 obesity were associated with significantly higher all-cause mortality in comparison to normal weight. In addition, being overweight was associated with significantly lower all-cause mortality. Pepper et al. reported the results of a meta-analysis on the correlation between BMI and mortality due to sepsis or septic shock (2), and concluded that being overweight or obese reduced the adjusted mortality rate in adults admitted to intensive-care units with sepsis, severe sepsis, or septic shock. In these two reports, patients with a BMI of ≥40 was classified into a single group. However, categories of malignant obesity, specifically super obesity (BMI ≥50) and super-super obesity (BMI ≥60), have been established (http://medical-dictionary.thefreedictionary.com/Super+Super+Obesity). Of note, super-super obesity tends to be associated with elevated mortality in patients undergoing the duodenal switch procedures (3).

Necrotizing soft tissue infection is a life-threatening condition. Early operative debridement is necessary to restore the appearance of the tissue or to confirm the diagnosis and to reduce mortality among patients (4, 5). We herein report a fatal case of super-super obesity (BMI >80) complicated by a necrotic soft tissue infection.

2. Case Presentation

A 35-year-old man (height, 169 cm; weight, 240 kg; BMI, 84) visited the Department of Dermatology due to left leg pain, redness and swelling. Focused enhanced computed tomography (CT) of the left leg ruled out complications of deep venous thrombosis. He was diagnosed with cellulitis...
and was sent home with a prescription for Cefdinir. The next day, the symptoms of his left leg deteriorated, and he re-visited the Department of Dermatology. A biochemistry analysis of his blood revealed multiple organ dysfunction, so our department was consulted. The patient had a history of recurrent cellulitis, and he had been obese since he was a child. He was employed in home demolition. On a physical examination, he could not stand by himself due to pain. As a stretcher could not accommodate him, a bed was retrieved from a ward; nine people lifted him onto the bed. The side bars on the bed had to be removed in order to accommodate the patient.

On admission, the patient’s Glasgow Coma Scale score was 15. A physical examination revealed the following: blood pressure, 174/65 mmHg; heart rate, 108 beats per minute; respiratory rate, 30 breaths per minute; SpO2, 98% (with 3 L/minute of oxygen using a nasal cannula); and body temperature, 36.7°C. His left leg had redness, swelling, and tenderness (Figure). A venous gas analysis revealed the following: pH, 7.352; PCO2, 28.8 mmHg; PO2, 61.7 mmHg; HCO3−, 15.5 mmol/L; and lactate, 6.2 mmol/L. An electrocardiogram showed sinus tachycardia. A chest roentgenogram revealed cardiac enlargement. CT could not be performed to detect the focus of the sepsis because the CT gantry revealed cardiac enlargement. CT could not be easily moved by a few people, and changing the patient’s position was very difficult, thus a special lift machine was required for even the most basic of maneuvers. Furthermore, CT could not be performed as the gantry could not accommodate such a large patient. Securing a venous route was very difficult, and some materials did not reach the vascular bed due to the thickness of the patient’s subcutaneous fat. The appropriate volume of infusions and drug dosages were also difficult to determine. The administration of 30 mL/kg crystalloid for hypotension or lactate ≥4 mmol/L is recommended for sepsis patients, based on the 2016 Surviving Sepsis Guidelines (6) (30 mL/kg ×240 kg =7,200 mL). However, the administration of ≥5 L of fluid to sepsis patients during the first ICU day is associated with a significantly increased risk of death and markedly increased hospital costs (7). The drug dosage determined on a per-kilogram basis easily exceeds the maximum dosage covered by medical insurance. Accordingly, it is very difficult for general hospitals to treat patients with a BMI of >80.

Obesity is prevalent in the United States of America (US), and bariatric surgery is often performed to improve weight control. Hospitals in which bariatric surgery is performed are equipped with special beds, lifts, and medical equipment designed to accommodate obese patients (8, 9). The 2015 guidelines for the perioperative management of obese surgical patients in England also emphasizes the preparation of special equipment for such patients (10). Accordingly, a special hospital with appropriate equipment and specially trained staff members might be required to treat super-obese patients in Japan. However, even US-based hospitals face a number of challenges when super-obese patients are admitted to the intensive-care unit. One report suggested that, among patients undergoing laparoscopic gastric operations, the rates of postoperative mortality and morbidity in patients with BMI values of >60 are not higher than those of patients with lower BMI values (11). However, there have been no reports concerning the mortality and morbidity rates of patients with BMI values of >80 (super-super-super...
This degree of obesity might lead to severe disturbance of the microcirculation disturbance in the fatty tissue, which may be complicated by infection (12, 13). Accordingly, even in hospitals outfitted with special equipment to accommodate super-super obese patients, a fatal outcome might be expected when a patient with a BMI of >80 develops infection. Tatusov et al. reported the case of a patient with a BMI of 115 and obesity hypoventilation syndrome whose hospital course was remarkable (14).

Super obesity is often accompanied by multi-system organ dysfunction, a condition associated with rates of high morbidity and mortality and few treatment options. In addition, standard imaging techniques and procedures are difficult or impossible to apply and often require expert intervention, similar to the present case. Surgical options have been used to treat super-obesity. These result in rapid weight loss, an improvement in the respiratory function, an improved metabolism and decreased inflammation (15). Accordingly, aggressive treatments, including early surgical intervention for super-obese patients, should be recommended before lethal complications occur.

The authors state that they have no Conflict of Interest (COI).

Acknowledgement
This manuscript received financial support from the Ministry of Education, Culture, Sports, Science and Technology (MEXT)-Supported Program for the Strategic Research Foundation at Private Universities, 2015-2019, concerning [The constitution of a total research system for comprehensive disaster and medical management, corresponding to a wide-scale disaster].

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