

Resuscitative Challenges in the Obese Patient

Reginald J Eadie, MD, Rochester Center for Obesity Treatment, Rochester, Michigan

Summary

Emergency Department resuscitations are intended to maintain blood flow to vital organs to prevent tissue death. Although emergency medicine physicians are masters of resuscitation, obese patients pose more of a challenge during emergent resuscitative procedures than non-obese patients. The challenges range from transportation restrictions, anatomic dissimilarities, to inadequate hospital accommodations.

Case Report

Obesity is a disease affecting families across America at an alarming rate. Over 33% of North Americans are obese (4). It extends its wrath far beyond the household and into the local emergency departments. Routine visits to the emergency department are handled similarly for patients of all weight groups. However, in the event that resuscitation is indicated, the obese patient presents a much greater challenge than the non-obese patient.

Often times, these challenges begin prior to hospital arrival. After successfully transferring such patients to the hospital,

health care providers must begin resuscitative measures, which present another host of challenges. It is at this point that health care providers must secure and protect the patient's airway, breathing and circulation. With anatomical and physical alterations in obese patients, every obese patient presenting to the emergency department is a potential airway management disaster. In order to provide adequate emergent care to the obese patient, health care professionals must first provide appropriate accommodations.

Introduction

Emergency Department resuscitations are designed to maintain circulation of oxygenated blood to the vital organs, especially the heart, brain, and kidney in an attempt to prevent the degenerative processes associated with anoxia and tissue death until spontaneous cardiopulmonary function can be restored. The most important factors in determining the success of such efforts are the time elapsed before resuscitative procedures begin and overcoming the challenges that face the health care providers. The obese patient provides a

Address correspondence to:
**Reginald J Eadie, MD, Clinic Physician,
Rochester Center for Obesity Treatment,
441 South Livernois, Rochester, Michigan
48307**

unique mental, anatomical and physical presentation to the physician, which makes their resuscitation efforts more difficult. A case of an obese middle-aged male in need of immediate resuscitation is presented here.

Case Presentation

The family of a 48-year-old male called 911 after he complained of shortness of breath x 3 days and a sudden onset of chest pain. Upon the arrival of EMS, the paramedics found an obese male lying on his bed in obvious respiratory distress. His family estimated his height to be seventy-two inches and his weight to be over four hundred and eighty pounds (BMI >55). The paramedics were unable to safely carry him down to the first floor therefore additional assistance was requested. Local firefighters arrived approximately 20 minutes later and successfully placed the patient onto the transport vehicle. Within minutes, EMS arrived at the nearest Emergency Department but again needed assistance to transfer the patient from the truck to the resuscitation suite.

Physical examination revealed a now lethargic male with severe respiratory distress. He was slightly hypotensive (BP 90/50 mm Hg), tachycardiac (heart rate 130 beats per minute), tachypneic (respiratory rate 44 breaths per minute), and had an oxygen saturation of 88% on room air. His pupils were equal and reactive to light. Lungs with diffuse expiratory wheezing bilaterally and bibasilar crackles. The cardiac examination revealed an S3 gallop. He had bilateral lower extremity edema. His skin was cool and clammy. The patient could not speak in complete sentences

and was using accessory muscles to breath.

For airway protection, the emergency department prepared for rapid sequence intubation. Rapid sequence intubation is the quick, nearly simultaneous, administration of both a neuromuscular blocking agent and a potent sedative agent to facilitate endotracheal intubation while decreasing the risk of aspiration, combativeness, and potential damage to the patient. The patient was successfully sedated and paralyzed only after a subclavian central line was placed as the nursing staff were unable to obtain peripheral IV access. The three attempts at endotracheal intubation were unsuccessful because of his large tongue and short thick neck (which inhibited mobility and made laryngeal visualization very difficult). The patient became increasingly unstable thus an emergent cricothyroidotomy was performed.

The patient's vital signs began to normalize after an airway was established. An EKG showed an acute inferior wall myocardial infarction. His chest X-ray displayed mild pulmonary edema and cardiomegaly. His lab work was unremarkable with the exception of glucose of 284 mg/dl and a troponin of 6.4 ng/ml. After further history was obtained from the family, it was learned that he had a past medical history of hyperlipidemia, hypertension and cardiomegaly. He had been obesity since childhood.

Discussion

Obesity is a fairly common disease in the United States particularly in urban areas. During medical emergencies,

these patients pose a wide range of challenges to health care professionals. Obese patients may not present until late in the course of their illness due to mobility and transportation problems, sedentary life-styles, and depression. For obese patients, it takes a great deal of effort to get to an emergency department, and the patient may feel embarrassed and frequently have an awareness of the resentment that is too often manifested by medical personnel because of their size (5). Often times an obese patient comes to an emergency department with significant pathology and a sense of not belonging.

Emergency Medicine physicians specialize in airway protection, control of breathing and maintaining circulation (Airway, Breathing and Circulation). Airway protection is one of the most critical interventions in emergency medicine and is the first step in saving a patient's life (4). Airway compromise can lead to cardiac arrest in 4-10 minutes, and irreversible CNS damage occurs within 3-5 minutes of ventilatory shut down (4). Once the airway has been secured, the breathing must be controlled either by hand or mechanically. Difficulties with mask ventilation and endotracheal intubation may be considerable in the obese with the incidence of complicated intubations being greater than 13% (1). Several factors increase the risk of an unsuccessful intubation or difficult ventilation:

- ✓ Fat face and cheeks
- ✓ Short neck
- ✓ Large tongue
- ✓ Excessive palatal and pharyngeal soft tissue
- ✓ High and anterior larynx

- ✓ Heavy head
- ✓ Limitation of cervical mobility

Establishing intravenous access permits physicians to control circulation via the administration of indicated medications. The goal being to sustain adequate blood pressure and flow to the essential tissues. This may be a problem because of the excessive amount of subcutaneous tissue present in obese patients (2). Deeper veins are seldom seen and very difficult to palpate. Many advocate establishing central venous access, but this in it self can be difficult in emergent conditions. The landmarks, skin infections (yeast) and skin folds make central line placement nearly impossible. Also, emergency department beds are designed for patients weighing up to 120-140 kg (1). Exceeding this limit may put the patient and staff at risk. Specially designed beds may be required for such patients.

A large part of the U.S. patient population consists of obese patients. Emergency medicine physicians, nurses, paramedics and other health care providers must become patient advocates for the obese patient. They must rally hospital administrators to ensure that they provide the appropriate amenities and services to accommodate obese patients. This must be done to guarantee that obese patients receive appropriate health care in a timely manner.

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