Difficult intubation and Emergency Tracheotomy in morbid obesity

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Summary. Introduction: Difficult intubation (DI) may require emergency tracheotomy (ET) to save patient´s life is a rare complication in the morbidly obese (MO). Probably it occurs more often than is published. Objective. To publicize this vital urgency and treat it with the possible alternatives. Methods: Three patients in a series of 1497 patients required ET and they belong to the latter part of the series. Results: In the three OM the ET was conducted without any technical incident and surgery continued in all of them. Conclusion: DI should be suspected in the patients before it may occur and endoscopic fiber-optic endoscopic intubation (FEOI) carried out, but if the ET is necessary, surgeons and instruments should be prepared to solve this vital problem.

Key words: Difficult intubation; obesity emergency tracheotomy; impossible intubation; impossible airway

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Background:
Anesthetic accidents can occur more frequently in the morbidly obese (MO). Difficult intubation (DI) is a rare complication rarely reported in the bariatric literature but frequently in Anesthesiology ones because it is a complication of his own specialty. However, a DI may need an emergency tracheotomy (ET) at the beginning of the surgical procedure to save the patient’s life.

Material y Method:
From May 1977 to February 2013, 3 patients required an ET among 1497 patients operated for MO, and they are the cause of this report.

Case 1. # 1309. A 44 years-old male patient had a BMI-35 with hypertension. Waist/hip ratio (WHR)-1.05. After several repeated attempts at intubation by two cooperating anesthesiologists, the SO2 stayed under 55. ET by 3 surgeons was done and the ventilation recovery obtained. We proceed with the planned Laparoscopic Vertical Gastrectomy (LVG) without incident. Extubation was done on the 3rd DPO. The ET wound closed but re-opened on 10DPO and second repair was needed. 30 months later he is BMI-26, EBM (expected BMI) -26, %EBMI-102%, %EWL 84% and %EBMIL 90%.

Fig. 1. Pre and pos. Full body and tracheotomy wound

Case 2. # 1423. A 39 years-old male patient has BMI-47 & WHI-1.1. He had Hypertension and diabetes Glucose 165. Gall bladder stones. After more than 10 intubation attempts by two anesthesiologists and inability to oxygenate, the SO2 dropped to 10-15. After a proper ET (carry out by 3 surgeons) oxygenation was restored quickly. Cholecystectomy and LVG performed. Post-op was normal. The tracheal tube removed on successfully. He is BMI-26 at 26 months, EBM-31% and %EBMI-131%, %EWL-87% and %BMIL-98%. He is completely asymptomatic and hypertension and diabetes are under control.

Fig. 2. Pre and pos. Full body and tracheotomy wound

Case 3. # 1458. A 37 years-old male BMI-4 had a previous total thyroidectomy and become hypothyroid. Diabetes was being treated with Metformin and insulin. Hypertensive. Chronic obstructive disease disease (COPD) treated with CPAP. After repeated intubation attempt a ET was done above the thyroidectomy scar. The planned surgery was LVG + duodenal diversion but only GVL was done. He stayed in ICU two days with subcutaneous emphysema on face and neck. Discharged on 11 POD, 3 months later he is BMI-31 and is asymptomatic and without insulin.

Fig. 3. Pre and pos. Full body and tracheotomy wound
In a survey among the surgeon’s readers of BMI 53 surgeons responded. 80% had a case of DI, 10 of them impossible intubation and resuscitation and ICU care without surgery, and only 3 cases of ET. One patient suffered cardiac arrest and trans-diaphragmatic manual resuscitation. A patient with BMI-57 died without being able due to impossible intubation. In several countries and especially among young surgeons they did not feel qualified to make an ET.

**Discussion:**

Difficult intubation among patients the MO are more frequent (8%) than in normal weight subjects [1]. In the NAP4 report of United Kingdom 77 obese patients had DI and 19 suffered death or brain damage due to the event including extubation at the ICU. Of the 53 events in MO during anesthesia were 4 deaths and 1 with persistent brain damage. At the global level is estimated that more than 600 deaths per year occur intubation failure [2].

The incidence of DI has been reported to occur between from 12 to 20% compared with 1-8% of non-obese patients [3-5], and Sheff [5] in 912 obese patients, 25 (2.7%) were asked fibro-optic intubation (IFO), 830 (91%) intubation without problems, and in 57 (6.3%) was ID. The ID even more prevalent in men was not associated with higher BMI, previous apnea or reflux (GERD). The DI was related to Mallampati class 4, abnormally restricted mental jaw motility and history of a prior DI.

Morbidly obese patients may have also sleep apnea (OSA), sleep has short necks and greater circumference. Obesity reduces lung compliance and raises the diaphragm leading to a decrease in functional residual capacity and therefore oxygen reserve. In addition, the supply of oxygen decreases more rapidly in obese than in non-obese intubation.

It is essential, pre-operative to detect those cases with a potential risk of DI exist to choose the most appropriate anesthetic strategy. To reduce the probability and consequences of aspiration rapid sequence induction must be considered and the use of drugs that reduce the volume and pH of gastric contents.

In addition, direct laryngoscopy is easier by placing the patient on “ramp position” (fig. 1) as an alternative to the traditional position. Once intubation is done the position should be maintained during surgery unless it interferes with ventilation, to facilitate facial mask ventilation or re-intubation if necessary after the procedure [7].

The anesthetic care of problems in obese patients include poor preoperative evaluation, failures in regional anesthesia, intubation failures and failures in rescue techniques airway. These faults serve to emphasize the different characteristics present this group of patients. One of the major faults is the failure to recognize obese patients as a high risk group, in order to properly adjust the anesthetic technique.

1. **Preoperative evaluation**

Preoperative evaluation is the key to a safe anesthetic intubation since it allows anticipating possible problems and handling. Planning should always include a bailout in the event of failure of the primary plan.

This prior assessment should evaluate comorbidities that may influence airway management including ischemic heart disease, diabetes mellitus, asthma and especially the OSA. The options for anesthesia should be discussed and explained, which in some patients need extra time. This cannot be done in haste. It would be inappropriate to enter these patients the day of surgery without a prior assessment.

Obesity should be considered a high risk event, even when the surgical procedure is a short one. As a rule, patients with BMI>40 or those BMI>35 with comorbidities should have formally preoperative assessment.

Steps to avoid extreme situations, such as the DI and ET, are:

1. Awake intubation with laryngeal local block for pain. So you can wake the patient and postpone the operation
2. An extra anesthetist in case of difficulties, if possible,  
3. Ramp position  
4. No deep relaxation to perform intubation.  
5. Ask the patient to lose weight pre-op weight and correct co-morbidities [8]

When DI may be suspected the steps to avoid an ET are

- Routine IFE  
- Classic Laryngeal Mask / ProSeal / Flexible  
- Laryngeal Mask Fastrach  
- Cricothyroidotomy cannula with plug  
- Retrograde intubation [2]

Anyway, once the patient is fully relaxed and SO2 is poor or very poor, the alternative to ET is a cricothyroid cannula open or percutaneous, or retrograde intubation. The disadvantage that these techniques are that it requires an standardized protocol, well-trained physicians and all instruments in the operating room.

Surgical crico-thyroidotomy is the simplest one because it is easy to extend it to a full ET. Retrograde intubation takes longer. To do this we must take into account that this DI can happens. In our case with >1300 previous cases it was unexpected since these patients looked apparently "easy" to
intubate. The operating room should be ready should the need for an ER occurs (tracheostomy cannulas, instrumental, etc.).

But the most important factor is the surgical team. All members of a surgical department should be trained to do tracheotomy. The ET is not for beginners with no previous experience. The technique is the usual one, except that due to the conditions of the obese (very thick neck and trachea at greater depth) it can be difficult and high risk. In these cases one addition surgeon (three surgeons) are better than two.

But in many countries young surgeons have not been trained during their residence years or have almost never seen one ET, because this task has delegated to ENT or the ICU teams. To avoid what we believe should be a correct training, all elective tracheotomy in ICU should be done (independent of what service is responsible surgery, OTL or ICU) with a surgical resident as the first assistant otherwise "The road to hell is paved of good intentions .......

Bibliografía:


