The method of gender selection mask size of the intubating laryngeal mask airway for overweight and obese patients

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The intubating laryngeal mask airway (ILMA Fastrach™) is an advanced device designed to allow ventilation/oxygenation as well as blind tracheal intubation (TI), but method of size selection of ILMA for patients with obesity isn’t clearly defined.

AIMS OF THE STUDY:	Obese patients are traditionally considered as a risk group for difficult-to-manage airways. We tested the hypothesis that the gender selection of ILMA Fastrach™ size is efficient for ventilation and blind TI for patients with overweight and obese with predictive signs of difficult airway or after intubation failure.
METHODS:	The reviewed prospective study of 156 adults undergoing of the general anesthesia I-IV classes ASA (100 males and 56 females) with increased body mass index (BMI) 25-30 kg·m ⁻² and obesity (BMI >30 kg·m ⁻²), in whom ILMA Fastrach™ was used electively or emergently at three clinical institutions from Oct 2007 to Oct 2015. Size selection was based on gender principle: ILM №5 for male and ILM №4 - for female. Estimated parameters: ventilation by a facemask; success of insertion ILMA, quality of ventilation (ILMA-V) and time for insertion/removal of ILMA and ETT (ILMA-TI). 20/156 patients allocated randomly and regurgitation was assessed by pH strips before insertion and after removal of ILMA.

Predictors of difficult airway (N=110 patients)

N of predictors	No signs of DTI (%)	Signs of DTI (%)	Signs of DTI (%)
1	25	55	20
2	35	35	30
3	15	50	35
4	15	30	55
5	50	25	25
6	60	25	15
7	20	55	25
8	15	15	70

X-axis – N of predictors; Y-axis – % of signs

1. Mallampati test: ■ I + II class; ■ III class – 58 ; ■ IV class – 14 patients

2. Test Patil: ■ > 6,5 cm; ■ <6,5 cm – 64; ■ Test Patil <6,5 cm + Mallampati test III - IV class – 38 pts;

3. El-Gonzouri A.R. scale: ■ < 4 scores ; ■ 4 scores – 42; ■ 5 scores – 46 pts;

4. The distance between the frontal teeth:
■ > 3,5 cm; ■ ≤ 3,5 cm – 18; ■ = 3 cm – 28 pts;

5. Compliance submaxillary space: ■ normal; ■ reduced – 68 pts;

6. Upper lip bite test: ■ Class A; ■ Class B – 28; ■ Class C – 3 pts; Macroglossia – 6 pts;

7. The length of the neck: ■ normal; ■ short neck – 82 pts;

8. The thickness of the neck: ■ normal; ■ bull neck – 88 pts.

The result of evaluating predictors of PDTI (N=20 patients) for the study of regurgitation (was assessed by pH strips)

	BMI 25-30 N=1 (5%)	BMI 30-35 N=10 (50%)	BMI 35-40 N=6 (30%)	BMI 40-45 N=2 (10%)	BMI>45 N=1 (5%)
The amount of predictors	4	37	27	9	5
Number of predictors per patient	4	3,7	4,7	4,5	5

CONCLUSIONS:

The ILMA is an easy-to-use airway device with a high success rate of insertion and requires little training time for ILMA-V and ILMA-TI. The choice of ILMA size, based on the gender principle, has been efficient for ventilation and TI of obese patients with predictive signs of difficult airway or after intubation failure. Using of ILMA does not increase the risk of regurgitation in the fasted and prepared patients.

Top left: Close-up of a patient's mouth with an ILMA being inserted. Top right: Profile view of a patient with an ILMA in place. Bottom left: Two medical professionals performing a procedure on a patient. Bottom right: A container of pH strips and two individual strips.

110 patients had 4 or more predictive signs of difficult TI (PDTI); in 46 patients with unpredicted difficult TI and ILMA was inserted after 2 attempts intubation failure (UDTI). 93/156 (59,6%) had ≥ 5 signs of PDTI. 58/156 patients were morbidly obese with BMI >40 kg m⁻²; 13/58 – BMI>45/58 kg m⁻², 10/58 – BMI>55 kg m⁻². The ventilation by a facemask was satisfactory without one cases and ILMA was successfully inserted at the first attempt within 8.2±2.9 s in 100%. The blind TI through ILM (ETT № 7.5 or 8) was successful in 147/156 (94,2%) of cases, and in 91% at first attempt. Total TI time was 7.5±4.8 s with, on ILMA removal – 9,2±1,5 s. 5 blind attempts of TI through ILM wasn’t possible and TI was made with intubating fiberoptic bronchoscope (n=3); ILMA was removed and replaced by LMA ProSeal or Supreme followed TI with direct laryngoscopy (n=2). In one case (49 years old female, ASA III, BMI=58.6 kg·m⁻²) due to clinical circumstances ILM placement and blind TI through ILMA was carried out 3 times at the first attempts. 46/156 patients had only 2-3 DTI predictors, but TI with direct laryngoscopy was unsuccessful. In this patients TI through ILMA was made at the first attempt 40/46 (86.9%) patients; 6 patients (13%) required adjusting manoeuvre for successful ILMA-TI. In 1 case was situation «cannot intubate – cannot oxygenate», ILMA provided ventilation/blind TI at the first attempt. Signs of regurgitation by pH (6.0) strips weren’t registered.