

**UNIVERSITY OF MEDICINE AND PHARMACY CRAIOVA
PhD STUDIES SCHOOL**

PhD THESIS

**DIFFICULT INTUBATION IN ENT PATHOLOGY
VIDEOLARYNGOSCOPY – ALTERNATIVE METHOD IN
ADVANCED MANAGEMENT IN PERMEABILITY OF THE
UPPER AIRWAY**

ABSTRACT

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CRAIOVA

2014

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Keywords: difficult intubation, difficult ventilation, malignant tumor pathology, predictive factors for difficult intubation, direct laryngoscopy, videolaryngoscopy.

Introduction

This paper presents a study of difficult intubation, falling directions of research literature, reaching especially faringo-laryngeal pathology problems, management in difficult airway instrumentation situations and new ways of using the technique of video-assisted intubation.

Stage of knowledge

Stage of knowledge was divided into seven chapters, including: notions of anatomy, physiology and pathophysiology of the upper airway, general information about difficult intubation and its important recognition especially in ENT pathology, also being presented the most important scores and scales described in the literature; are described in detail pathological conditions associated with difficult intubation in ENT, and how and specific techniques to maintain the patency of difficult airway.

Chapter I - Chapter V present the anatomy, physiology and pathophysiology of the upper airway, describing in detail the internal configuration, vascularization and innervation of the larynx, also anatomical and histological characteristics of infantile larynx (Chapter III).

In **Chapter VI** are described pathological conditions associated with difficult intubation: laryngeal and trachea trauma, accidental burns of larynx, trauma face (maxilla and mandible fractures), cervical spine injuries, infectious-inflammatory diseases, intubation in the malignant and benign tumors and difficult intubation in anatomical variants of congenital anomalies, in laryngeal diplegia intubation - respiratory form.

Chapter VII presents difficulties assessment methods of tracheal intubation by: Mallampati scale (grades I, II, III, IV), Cormack-Lehane scale (grades I, II, III, IV), the scale of the European Society of Intensive Care Congress (LEMON formula) and approach the difficult airway intubation techniques / difficult ventilation (laryngeal mask, LMA Fastrach, Combitube, retrograde intubation, awake intubation with flexible

fiberscope, stiletto-optic, videolaryngoscope-C-MAC Storz), invasive approach in case of failure intubation (percutaneous techniques of tracheotomy, tracheotomy performed by ENT doctor, transtracheal jet ventilation).

PERSONAL CONTRIBUTIONS

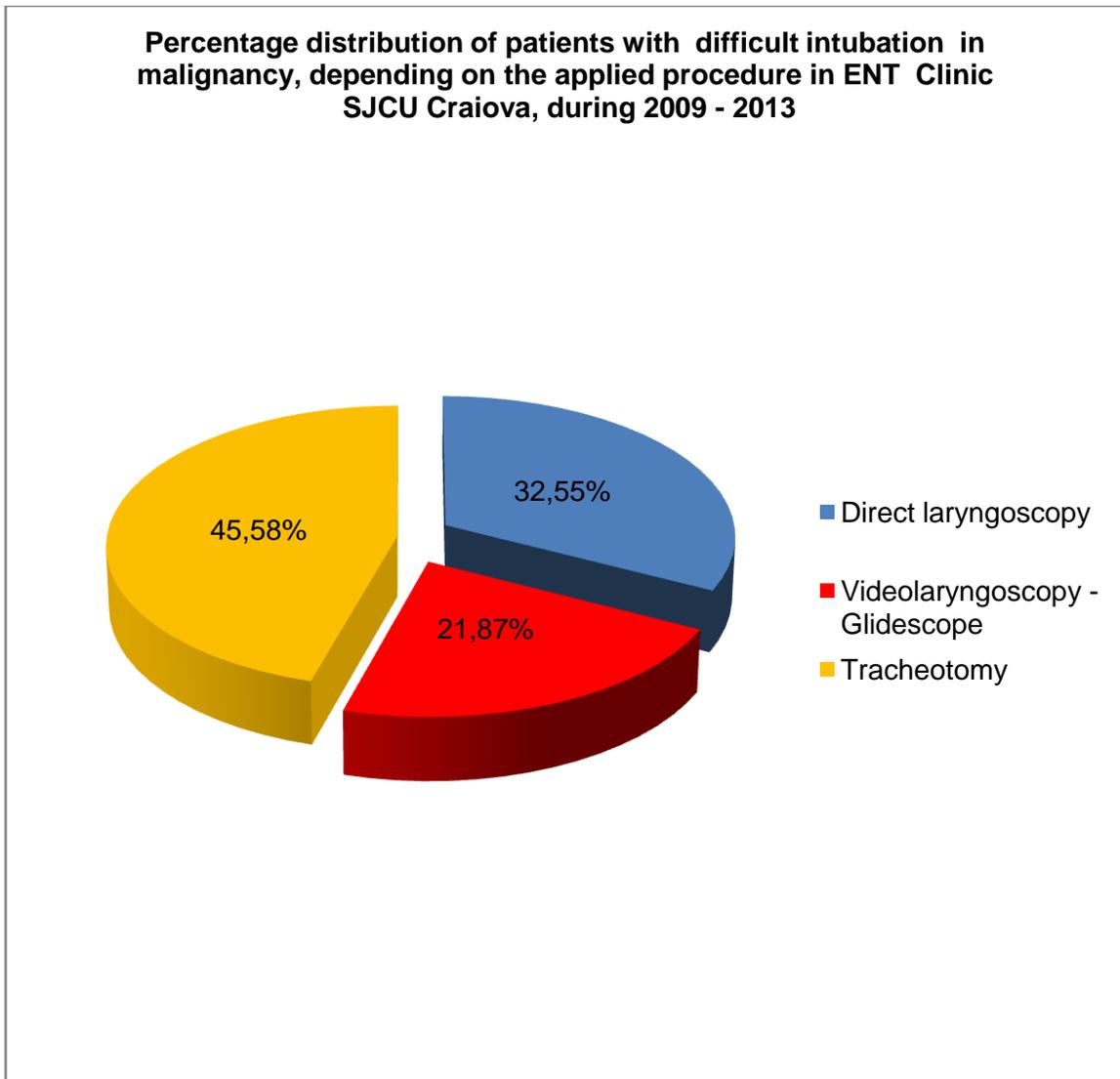
Chapter VIII is present in the second part of the thesis, the intended own study and includes a clinical trial conducted on two statistically groups (I - ENT patients admitted to the Emergency County Hospital Craiova, II - patients hospitalized in ENT Vâlcea County Emergency Hospital, undergoing surgery with general anesthesia and intubation), for a period of five years (2009-2013). Patients in both groups were included in the study based on:

- history, if the patient's condition permits;
- general clinical examination;
- preanesthetic consultation to establish the criteria for inclusion in difficult intubation (Mallampati scale, Cormack-Lehane score);
- assess predictive factors of a difficult intubation;
- laboratory and biological examinations;
- treatment (chemotherapy and radiotherapy).

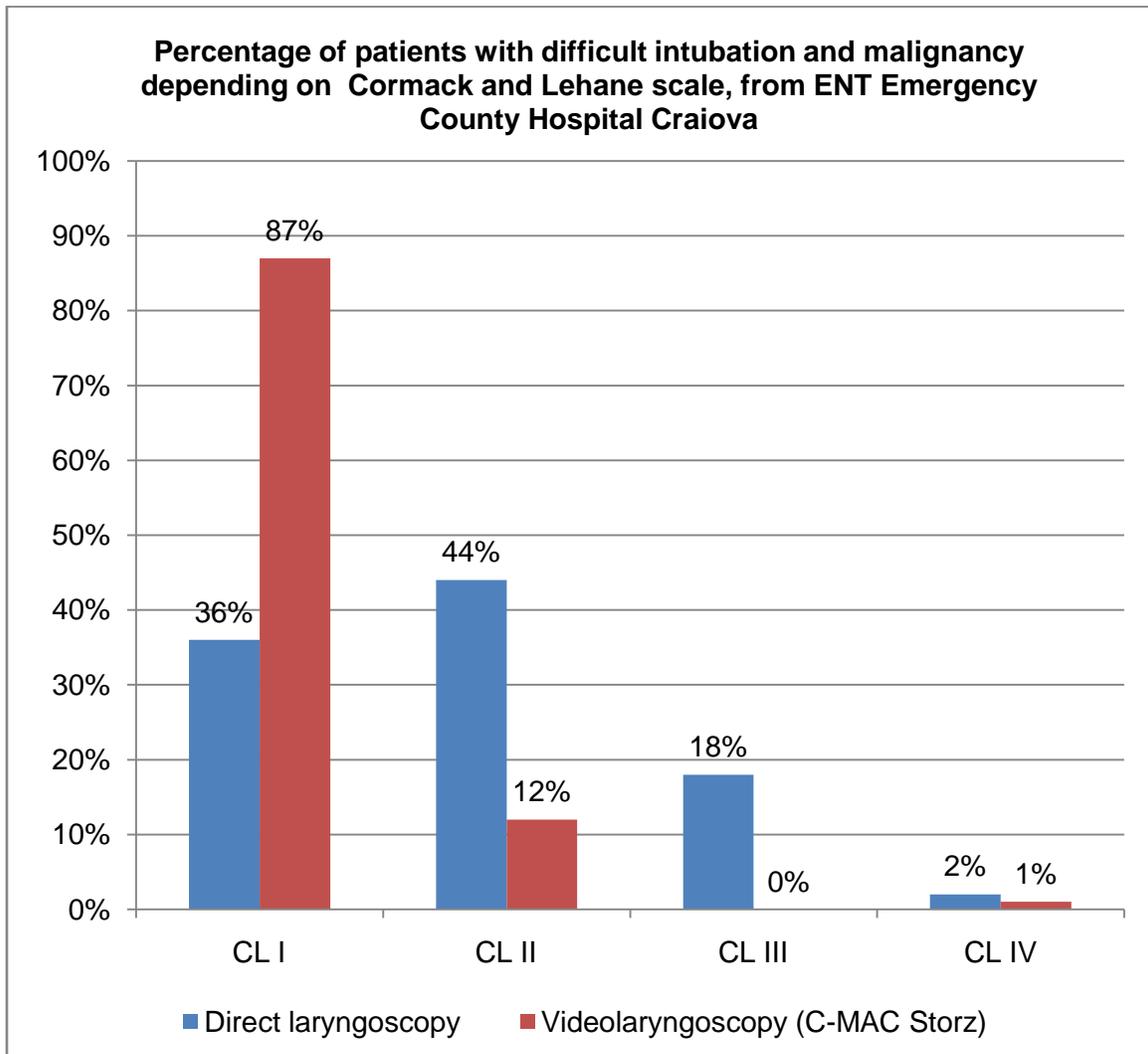
Preanesthetic consultation was conducted according to guidelines ASA (American Society of Anesthesiologists).

In **Chapter IX** I analyzed the first batch of patients admitted to ENT Emergency County Hospital Craiova, requiring the maintenance of the upper airway permeable and studied the percentage of difficult intubation, and the alternatives used in advanced management and represented by videolaryngoscopy. Thus, we conducted a statistical

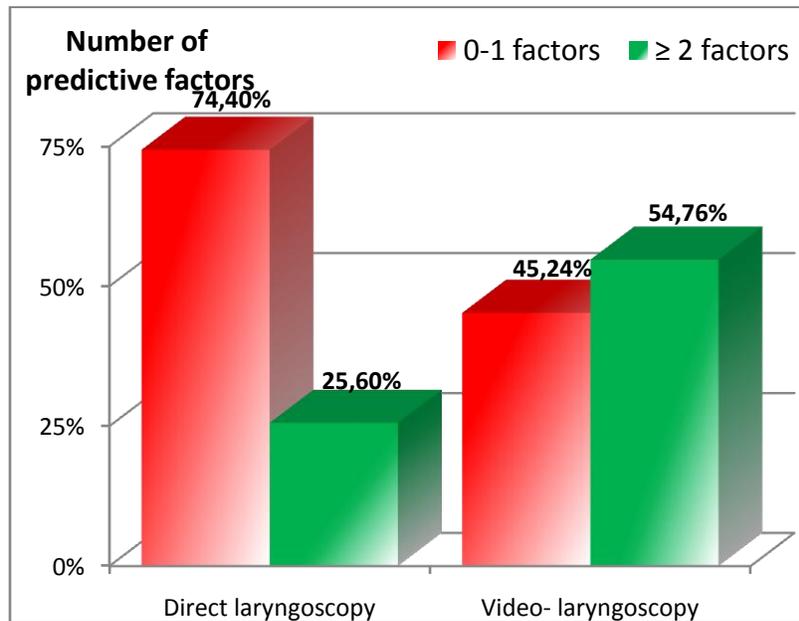
study on videolaryngoscopy technique advantage compared to direct laryngoscopy and its applicability in benign and malignant tumors, facial and cervical trauma, especially in the presence of several predictive factors of difficult intubation. Patients with malignant tumors and difficult intubation (384) are included in the study, which is a rate of 25.98% of the total of 1478 patients with malignancy, intubated. Percentage distribution according to the procedure followed shows: 32.55% cases with direct laryngoscopy, 21.87% cases with videolaryngoscopy, and 45.58% cases of intubation failure (tracheotomized).



From the study we observed that videolaryngoscopy transforms the Cormack-Lehane scale from a higher class in a lower class, so most patients present an overwhelming percentage grade (87%), while the patients with direct laryngoscopy are only 36%. In a class IV are the patients who used videolaryngoscopy and the percentage was only 1%, resulting a superior technique.

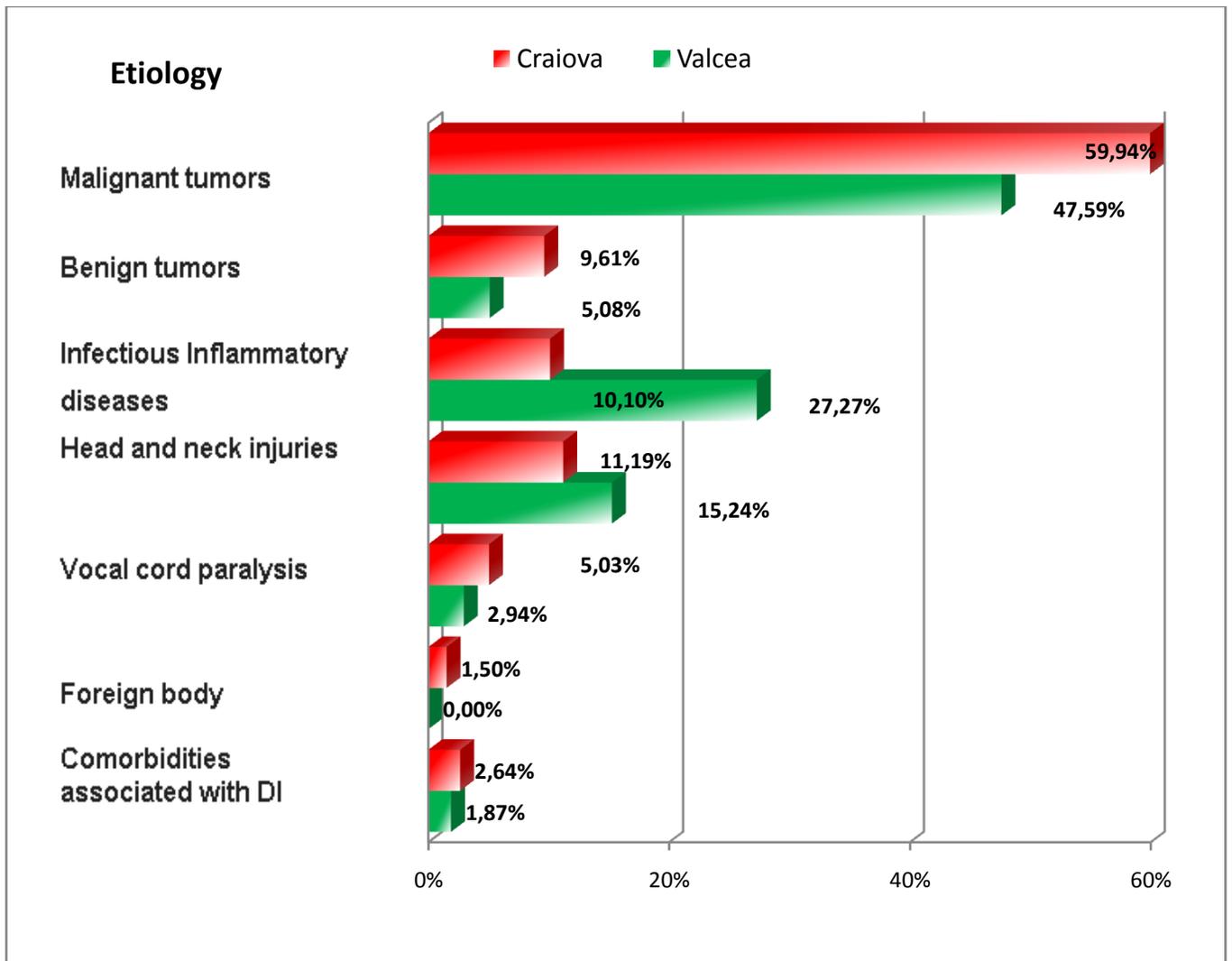


There is a highly significant difference in the number of predictive factors (in difficult intubation) between patients who underwent direct laryngoscopy and those undergoing videolaryngoscopy (54.76% of patients intubated with VLS and more than two predictive factors of difficult intubation compared with 25.60% of patients intubated with direct laryngoscopy with more than two predictive factors of difficult intubation).



In the second batch of patients hospitalized in the Department of ENT Vâlcea County Hospital we studied the distribution depending on the etiology of patients who required maintaining airway patency; etiology the most commonly implicated was in malignant tumors (178 patients-47.60%), followed by infectious and inflammatory pathology- (102 patients - 27.27%) and trauma (57 patients - 15.24%). Benign tumors are found at a rate of 5.08% (19 patients), while larynx diplegia-sd. Gerhardt represent the percentage of 2.94% (11 patients) and comorbidities associated with DI (rheumatoid Arthritis, morbid obesity) are in a percentage of 1.87%(7 patients).

Analyzing the etiology of patients required maintaining airway permeable, we found a highly significant difference between the two groups from the study. The biggest differences were recorded in causes of infectious and inflammatory Acute respiratory failure, who were the majority in the case of ENT Vâlcea County Hospital (almost 75%). Acute respiratory failure due to malignant tumors, were accounted for over 50% of cases encountered in ENT Craiova County Hospital.



Polyps in the posterior third of the vocal cord



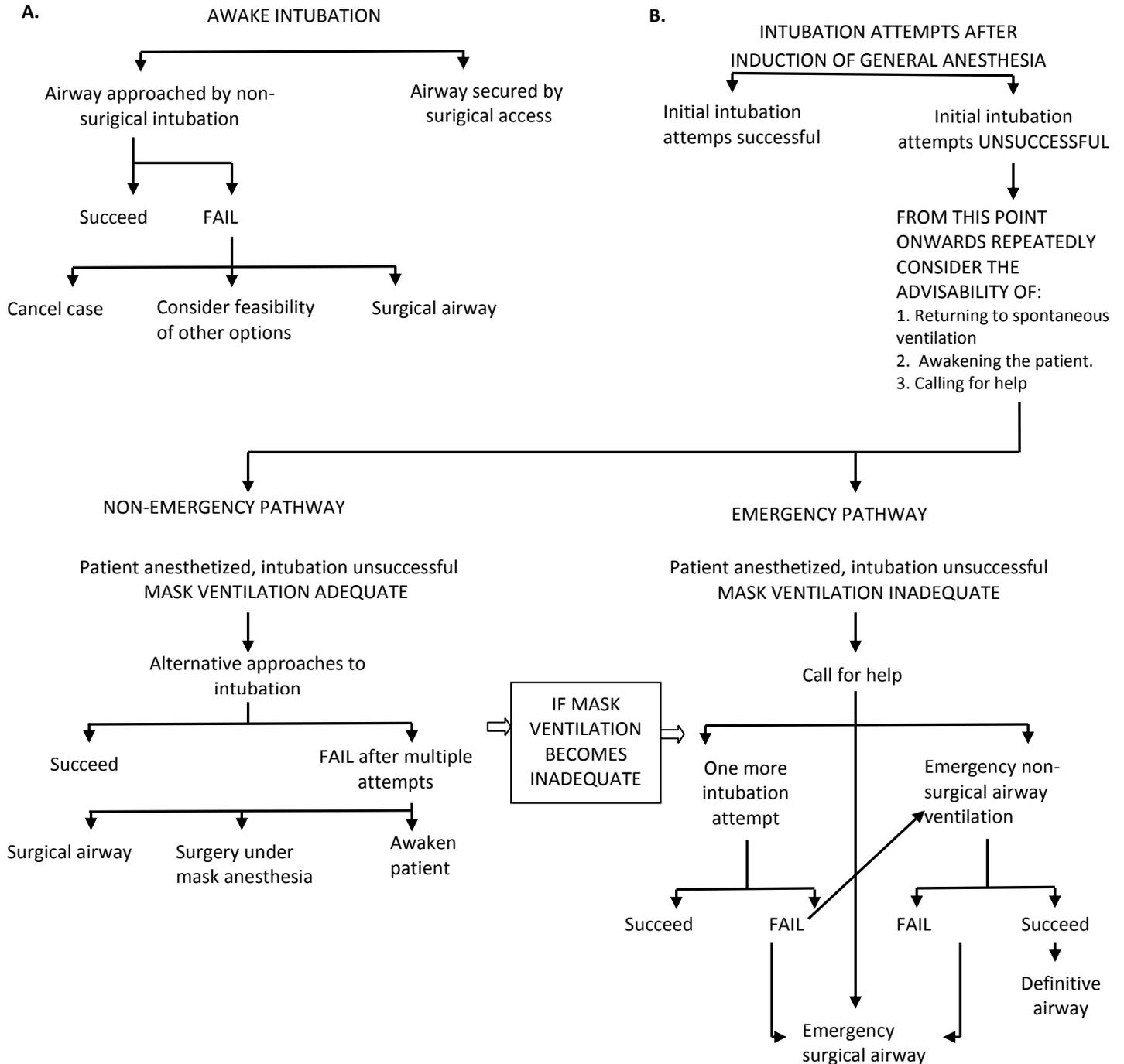
Pharyngolaryngeal cancer



The images above are two cases of patients with difficult intubation hospitalized in ENT Vâlcea County Hospital.

Chapter X contains difficult airway algorithm and the decisive role which videolaryngoscopy has in the management of patients who have difficulty anticipated airway intubation or failure.

DIFFICULT AIRWAY ALGORITHM (AMERICAN SOCIETY OF ANESTHESIOLOGISTS)



CONCLUSIONS

1. Difficult intubation and maintain upper airway patency are some of the conditions of survival of the patient.

2. The main causes are identified in difficult intubation belong to: malignant or benign pathology at various sites in ENT, traumatic injuries to the head caused by assault or accidents that may sometimes be associated with cervical fractures, burns of the face and neck; another category of diseases is the infectious inflammatory diseases such epiglottitis in children and chronic degenerative diseases (rheumatoid Arthritis, severe cifo-scoliosis).

3. The obvious conclusion in case of difficult intubation is that should always be a very accurate algorithm to be followed in these cases when it can occur the situation "Can not intubate, can not ventilate".

4. I believe that it must be a strategic plan for difficult situations in critically ill patients including: detailed history, personal medical history, examination complete and correct and not at least the difficult intubation algorithm of the American Society of Anesthesia to prevent failed intubation.

5. To improve the management of difficult intubation is necessary for the anesthetist to know and use indirect laryngoscopy technique (videolaryngoscopy).

6. Extreme cases in ENT pathology require to solve interdisciplinary collaboration between ENT surgeon and anesthesiologist, who turns out to be life saving.

7. Last but not least I consider it appropriate to draw up a medical record stating which shows that the patient has **difficult intubation**, which will be handed by the anesthetist before any surgery.

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