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Rapid Communication

How to facilitate the placement of a transesophageal probe in a ventilated patient?

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ABSTRACT

Purpose: Transesophageal probe insertion in the ventilated patients often is difficult. Different complex techniques were suggested for easier placement of the transesophageal probe.
In this work, we describe a simple technique of TEE probe insertion in ventilated patients.
Methods and results: In the period 2015–2018, 66 transesophageal echocardiographic examinations in anesthetized ventilated patients were carried out in accordance with the standard algorithm developed by us. During the transesophageal examination, all the patients were in the left decubital position and with their head tilted forward. In all the patients, TEE was done smoothly, from the 1st attempt, without complications.
Conclusion: In the anesthetized intubated and ventilated patients, the TEE probe can be easily inserted when the patient is in the left decubital position. We suggest this algorithm in all such patients, when appropriate.

1. Introduction

Insertion of transesophageal [TEE] probe in anesthetized patients is often a challenge even in experienced hands. Gastro-esophageal complications can occur: esophageal perforation [1], dysphagia [2], gastro-esophageal bleeding [3], buckling [4] of the probe that is not dangerous per se but can be followed with damage to the esophagus, damage of the oral mucosa and the pharynx. Temporomandibular joint dislocation as a complication of TEE probe insertion also was described [5]. Different devices and techniques were proposed for TEE probe insertion in the anesthetized patients. We describe here our experience with TEE probe insertion that was introduced in our hospital in the anesthetized patients.

2. Methods

During 2015–2018, all TEE examinations were performed in the anesthetized mechanically ventilated patients according to the unified algorithm [Figs. 1–4, Video 1]. The operator is located on the left side of the patient. Patients' bed was straightened, with the foots' and head' parts of the bed at the same level. The gastric content was suctioned and after then the gastric tube was removed. An endotracheal tube was fixed at the left corner of the mouth. The mouthpiece was inserted. 2–3 towels were placed under the patient' head to provide the straight position of the head at the level of the body. The head was slightly tilted forward [Fig. 1]. Then the TEE probe was inserted through the mouthpiece and directed with physicians' finger toward the esophagus [Fig. 2]. Sometimes patients' head was additionally gently flexed and the probe was advanced into the esophagus during the flexion maneuver [Fig. 3]. If resistance was filled by the operator during the probe insertion, a balloon of the endotracheal tube was slightly deflated. Finally, all the examination could be continued in the left decubital position [Fig. 4].

3. Results

During 2015–2018, 66 TEE examinations were performed in 51 anesthetized patients in our hospital according to the unified described above algorithm [six patients underwent TEE twice during the study period, and in one patient TEE was repeated 3 times]. In 49 cases TEE was performed in the Intensive Care Unit, in 15 TEE was done in the Intensive Coronary Care Unit, and in 1 patient TEE was done twice in the Department of Internal Medicine. Mean age was 69 ± 10 years, 34 males. The most frequent indication for performing of TEE was a search of vegetations in 50 cases, other indications included assessment of hemodynamically compromised patients with severe mitral regurgitation in 8, pulmonary embolism in 1, aortic dissection in 2, embolic search in 1, evaluation of left ventricular mass in 1, before cardioversion 2, in a search of mechanical complications of acute myocardial infarction in 1 patient.

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Fig. 1. The patient during TEE examination is in the left decubital position at his left side. Head is supported by the folded towels at the level of the body and is slightly flexed anteriorly. The endotracheal tube is fixated at the left corner of the mouth.

In all the patients, the TEE probe was inserted smoothly, from the 1st attempt. In all the patients, TEE procedure was uncomplicated.

4. Discussion

Transesophageal echocardiography in the anesthetized ventilated patients can be performed in the different settings: usually in the intensive care unit or in the operating room. TEE probe insertion in the anesthetized intubated patients on a ventilator is done in the supine position, from the head of the bed. Placement of the bite block before placement of the transesophageal probe isn't recommended, because this maneuver will displace the tongue posteriorly and will obstruct the passage of the probe. Lifting the mandible anteriorly and caudally usually opens the mouth and displaces the tongue anteriorly to allow smooth probe placement. Despite this, laryngoscope can be needed often and is even recommended [6] to see better pharyngeal anatomy. In many cases, the placement of the probe using laryngoscope can be complex. The mandibular maneuver by itself can result in temporomandibular joint dislocation [5], and gastro-esophageal complications related to the insertion of the probe also may occur [1-5].

Different adjuvant techniques and devices for easier and more accurate transesophageal probe placement were proposed: rigid laryngoscopy [7], airway scope [8], McGrath MAC Videolaryngoscope [9], glideScope [10]. All these techniques usually come after the blind transesophageal probe insertion was attempted few times.

Fig. 2. The tip of the transesophageal probe is inserted through the mouthpiece and is directed by the finger of the left hand toward the esophagus.

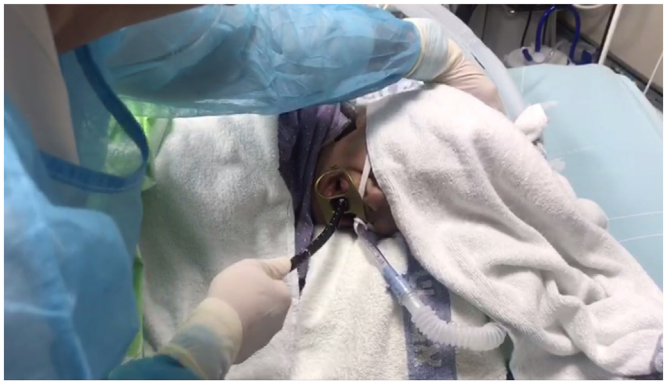

Fig. 3. Patients' head is slightly flexed anteriorly and the probe is advanced into the esophagus during the flexion maneuver.

The prototype of our technique is a standard algorithm of transesophageal probe placement in the echo-lab in awake patients, in the left decubital position with a head that is slightly flexed anteriorly. According to our experience, in anesthetized ventilated patients this method results in the easy and smooth probe placement. Fixation of the endotracheal tube at the left angle of the mouth is an important condition for successful probe placement. The head should be at the level of the body, it is best to choose 2–3 folded towels under the head, but an alternative option is a hard pillow. After the suctioning of the gastric content, we usually remove gastric tube for the time of the study for easier passage of the transesophageal probe and for better contact with the esophageal wall, that provides higher echocardiographic image quality. The operator is located in the usual position toward the patient and near the patients' bed. Sometimes, additional flexion maneuver [Fig. 3, Video 1] is needed for easier placement of the probe into the esophagus. Only in very unstable patients, which position should not be changed or in the operating room, this technique can't be implemented.

5. Conclusions

We suggest a very simple and safe technique for insertion of the TEE probe in the anesthetized ventilated patients, when appropriate.

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Fig. 4. The probe is in the esophagus.

Conflict of interests

There are no disclosures.
There is no conflict of interests.

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