Airway Assessment

Airway Assessment

Why Assessment?

- Optimal patient preparation
- Selection of equipment and technique
- Participation of personnel experienced in difficult airway management.

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Prediction of Difficult Mask Ventilation

Olivier Langeron, M.D., Eva Masso, M.D.,† Catherine Huraux, M.D.,‡ Michel Guggiari, M.D.,‡*
André Bianchi, M.D.,‡ Pierre Coriat, M.D.,§ Bruno Riou, M.D., Ph.D.‖

Background: **Maintenance of airway patency and oxygenation are the main objectives of face-mask ventilation. Because the incidence of difficult mask ventilation (DMV) and the factors associated with it are not well known, we undertook this prospective study.**

Methods: **Difficult mask ventilation was defined as the inability of an unassisted anesthesiologist to maintain the measured oxygen saturation as measured by pulse oximetry > 92% or to prevent or reverse signs of inadequate ventilation during positive-pressure mask ventilation under general anesthesia. A univariate analysis was performed to identify potential factors predicting DMV, followed by a multivariate analysis, and odds ratio and 95% confidence interval were calculated.**

Results: **A total of 1,502 patients were prospectively included. DMV was reported in 75 patients (5%; 95% confidence interval, 3.9–6.1%), with one case of impossible ventilation. DMV was anticipated by the anesthesiologist in only 13 patients (17% of the DMV cases). Body mass index, age, macroglossia, beard, lack of teeth, history of snoring, increased Mallampati grade, and lower thyromental distance were identified in the univariate analysis as potential DMV risk factors. Using a multivariate analysis, five criteria were recognized as independent factors beard, lack of teeth, history of snoring), the presence of two indicating high likelihood of DMV (sensitivity, 0.72; specificity, 0.73).**

Conclusion: **In a general adult population, DMV was reported in 5% of the patients. A simple DMV risk score was established. Being able to more accurately predict DMV may improve the safety of airway management. (Key words: Airway management; anesthesia complication; anesthesia risk; difficult intubation.)**

DIFFICULTIES or failure in managing the airway are the major factors underlying morbidity and mortality related to anesthesia.[1] To facilitate the management of the difficult airway and to reduce the incidence of severe adverse outcomes during airway management, practice guidelines have been established,[2–4] and several algorithms have been developed. One component of many such algorithms is the preoperative assessment and recognition of the difficult airway.[2–4] Prediction is mainly based on factors associated with difficult tracheal intu-

Original Article

Prediction of difficult mask ventilation using a systematic assessment of risk factors vs. existing practice – a cluster randomised clinical trial in 94,006 patients

A. K. Nørskov,[1,2] J. Wetterslev,[2] C. V. Rosenstock,[1] A. Afshari,[3] G. Astrup,[4] J. C. Jakobsen,[2,5] J. L. Thomsen,[6] L. H. Lundstrøm[1] and Collaborators*

1 Resident, Associate Professor, Consultant, Department of Anaesthesiology, Nordsjællands Hospital, Hillerød, Denmark
2 Resident, Chief Physician, Consultant, Copenhagen Trial Unit, 3 Consultant, Juliane Marie Centre, Rigshospitalet, Copenhagen, Denmark
4 Consultant, Department of Anaesthesiology and Intensive Care, Aarhus University Hospital, Aarhus, Denmark
5 Consultant, Department of Cardiology, Holbæk Hospital, Holbæk, Denmark
6 Resident, Department of Anaesthesiology, Herlev Hospital, Herlev, Denmark

Summary

We compared implementation of systematic airway assessment with existing practice of airway assessment on prediction of difficult mask ventilation. Twenty-six departments were cluster-randomised to assess eleven risk factors for difficult airway management (intervention) or to continue with their existing airway assessment (control). In both groups, patients predicted as a difficult mask ventilation and/or difficult intubation were registered in the Danish Anaesthesia Database, with a notational summary of airway management. The trial's primary outcome was the respective incidence of unpredicted difficult and easy mask ventilation in the two groups. Among 94,006 patients

A. K. Nørskov,[1,2] J. Wetterslev,[2] C. V. Rosenstock,[1] A. Afshari,[3] G. Astrup,[4] J. C. Jakobsen,[2,5] J. L. Thomsen,[6] L. H. Lundstrøm[1] and Collaborators*

1 Resident, Associate Professor, Consultant, Department of Anaesthesiology, Nordsjællands Hospital, Hillerød, Denmark
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Correspondence to: A. K. Nørskov
Email: anderskehlet@hotmail.com
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Airway Assessment

- History
- General Assessment
- Special assessment tools to predict difficult airway.

History

- Previous surgery-Anaesthetic exposure
- Previous difficulty in intubation: Anaesthetic chart/Airway alert
- Snoring, OSA
- Hoarse voice/stridor
- Acquired airway difficulties: Trauma,Burns,Tumor in and around oral cavity

General Assessment

- Body Stature
- Head and neck movement
- Congenital anomalies
- Obesity
- Pregnancy
- Arthritis

General Assessment

- Presence of beard
- Abnormal dentition
- Jewellery and facial piercing

Specific Airway **Assessment**

- Mallampati Classification.
- 3-3-2 assessment.
- Advanced assessment tools.

Evaluate 3-3-2

- *3- Fingers Mouth Opening*
- *3- Fingers Hypomental Distance*: 3 Fingers between the tip of the jaw and the beginning of the neck (under the chin)
- *2- fingers between the thyroid notch and the floor of the mandible (top of the neck)*

Neck movement

Prior condition

- Surgery
- Rheumatoid arthritis
- Osteoarthritis
- Others

Advanced assessment tools.

LEMON criteria:

- L=Look externally (facial trauma, large incisors, beard or moustache, and large tongue)
- E=Evaluate the 3-3-2 rule (incisor distance <3 fingerbreadths, hyoid/mental distance <3 fingerbreadths, thyroid-to-mouth distance <2 fingerbreadths)
- M=Mallampati (Mallampati score 3)
- O=Obstruction (presence of any condition that could cause an obstructed airway)
- N=Neck mobility (limited neck mobility).

Specific Screening Tests to Predict Difficult Intubation.

- **Thyromental distance** The normal distance is 6.5cm or greater and is dependant on a number of anatomical factors including the position of the larynx.

- **Sternomental distance** is measured from the sternum to the tip of the mandible A sternomental distance of 12.5cm or less predicted difficult intubation .

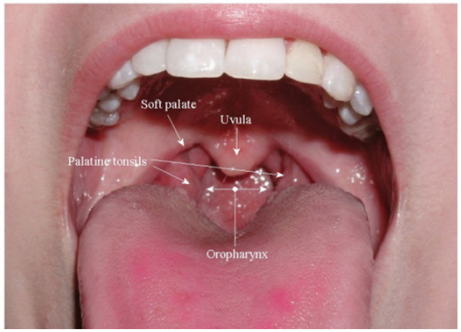
- **Extension at the atlanto-axial joint** Reduction of movement at this joint is associated with difficulty.

- **Protrusion of the mandible** If the patient cannot get the upper and lower incisors into alignment intubation is likely to be difficult.

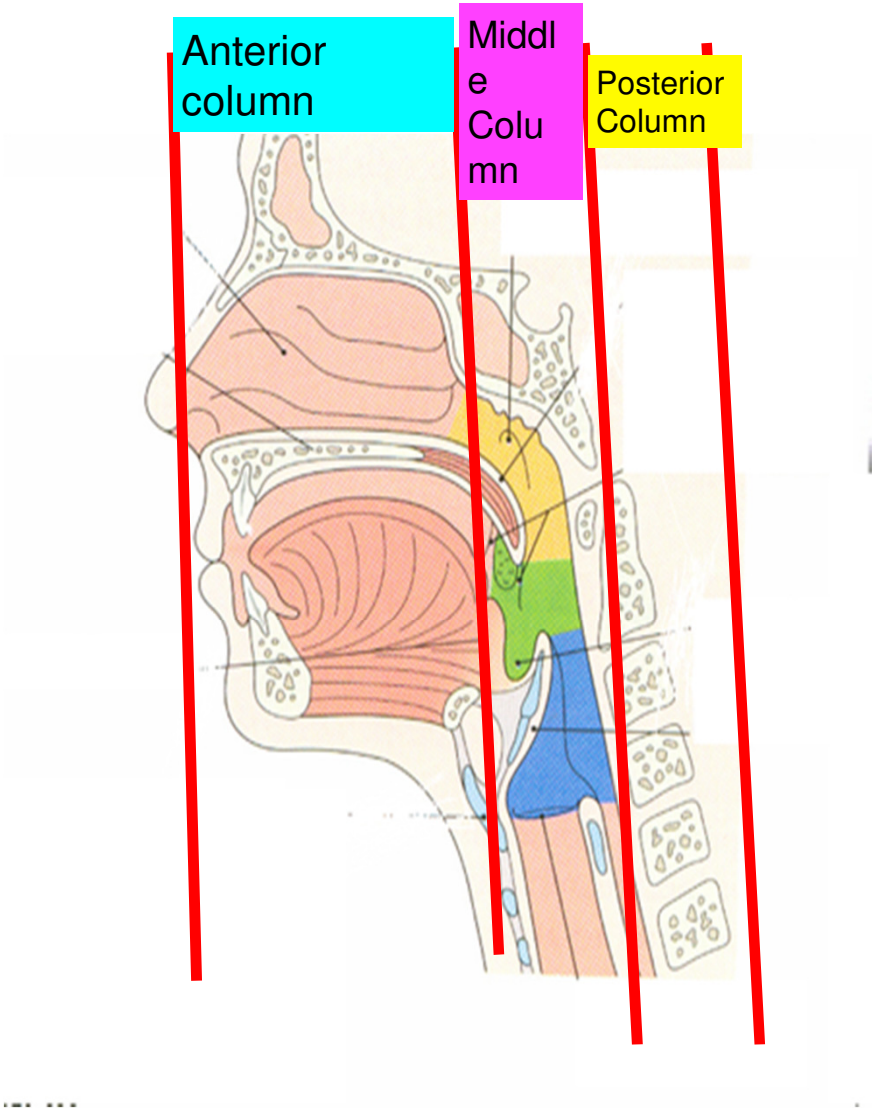
- **Wilson et al** studied a combination of these factors in a surgical population assigning scores based on the degree of limitation of mouth opening, reduced neck extension, protuberant teeth and inability to protrude the lower jaw

- **X-ray studies**

Airway Assessment & Planning



Airway Assessment



Greenland

Three column model of airway assessment

Anterior column

- Volume of submandibular space: thyromental distance and MP score
- Compliance of submandibular space: Radiotherapy, burns, infection
- TMJ function: Mouth opening and mandibular protrusion

Middle Column

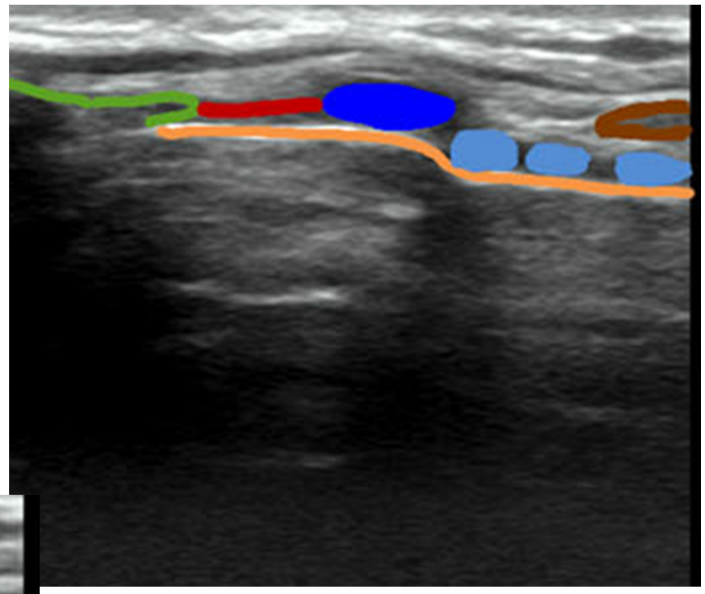
- Airway passage: History
  CT/ MRI for pharyngeal & laryngeal pathology & Nasendoscopy

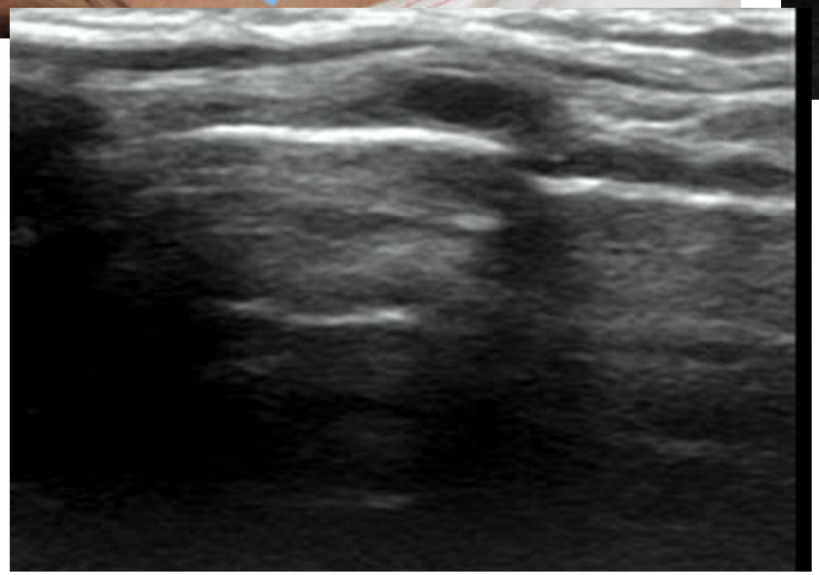
Posterior Column

- Neck extension at Atlanto-occipital joint and lower c-spine flexion

Cricothyroid membrane

Tracheal rings and cricoid ring





String of beads or pearls

Airway assessment

- Mask ventilation – possible?
- LMA/ igel insertion-possible?
- Intubation – possible ?
- Cricothyroidotomy –possible?
- Extubation plan – Re-intubation possible?

Thank You