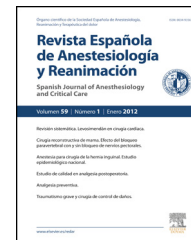




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ORIGINAL ARTICLE

Influence of pharyngolaryngeal anomalies diagnosed through indirect laryngoscopy in the prediction of difficult intubation[☆]

J. Sánchez-Morillo*, L. Gómez-Diago, M.J. Hernández-Cádiz, J. Balaguer-Doménech, G. Barber-Ballester, M. Richart-Aznar

Servicio de Anestesiología y Reanimación, Hospital Universitario Dr. Peset, Valencia, Spain

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Airway management/
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intubation;
Epiglottis—pathology;
Logistic models

Abstract

Objective: To determine the pharyngolaryngeal anomalies not usually included in the evaluation of difficult airway, in order to investigate the influence of these anomalies in the prediction of difficult intubation. To do this, indirect laryngoscopy with a 70° rigid laryngoscope was performed on all patients during the preoperative period.

Methods: This is an observational, prospective study on 300 consecutive patients who were scheduled for endotracheal intubation under general anesthesia. In addition to assessing the airway in the preoperative period by demographic and clinical predictors of difficult airway, rigid indirect laryngoscopy was performed to diagnose pharyngolaryngeal anomalies. Later, under general anesthesia and direct laryngoscopy it was checked to see if there was difficulty in intubating the larynx, and its association with all previous variables was investigated. A logistic regression model for prediction purposes was developed, and its power of discrimination was achieved by assessing the area under the curve.

Results: During the examination by indirect laryngoscopy 46 anomalies were found, which were as follows: 31 abnormalities of the epiglottis (22 omega epiglottis, nine flaccid or hypertrophic epiglottis); six findings of hypertrophic lingual tonsils, three cases of upper airway tumors, and six patients with tongue disorders. Intubation difficulty was found in 14 cases (4.66%). The regression model found and its coefficients to develop it were: $f(x) = 1.322 + (2.173 \text{ thyromental distance } < 6.5 \text{ cm}) + (1.813 \text{ omega epiglottis}) - (1.310 \text{ cm opening mouth})$. Global power of discrimination was 0.83, with a 95% confidence interval from 0.709 to 0.952.

Conclusion: Indirect laryngoscopy allowed pharyngolaryngeal anomalies to be diagnosed, including omega epiglottis, which was one of the variables included in the logistic regression model.

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* Corresponding author.

E-mail address: jorgesm@nexo.net (J. Sánchez-Morillo).

PALABRAS CLAVE

Manejo de la vía aérea: métodos;
Laringoscopia: métodos;
Laringoscopios;
Intubación intratraqueal;
Epiglotis: patología;
Modelos logísticos

Influencia de las anomalías faringolaríngicas diagnosticadas mediante laringoscopia indirecta en la predicción de la dificultad de intubación

Resumen

Objetivo: Detectar anomalías faringolaríngicas no valoradas habitualmente en la evaluación de la vía aérea difícil mediante la realización en el preoperatorio de una laringoscopia indirecta con el laringoscopio rígido e investigar su influencia en la predicción de la dificultad de intubación traqueal (DIT).

Métodos: Estudio observacional prospectivo en 300 pacientes consecutivos sometidos a intervenciones quirúrgicas programadas bajo anestesia general. Además de evaluar los predictores demográficos y clínicos comunes de la vía aérea difícil, les fue practicada en el preoperatorio una laringoscopia indirecta con el laringoscopio rígido para diagnosticar las anomalías faringolaríngicas. Después, bajo anestesia general y laringoscopia directa comprobamos en qué pacientes existía DIT. Se investigó la asociación de todas las variables anteriores con la DIT, se confeccionó un modelo de regresión logística con fines predictivos y su poder de discriminación se consiguió valorando el área bajo la curva ROC obtenida.

Resultados: Se contabilizaron 46 anomalías: 31 alteraciones de la epiglotis (22 epiglotis abarquilladas, 9 epiglotis flácidas o hipertrofiadas), 6 amígdalas linguales hipertróficas, 3 tumores en la vía aérea superior y 6 alteraciones de la lengua. Se encontró DIT en 14 casos (4,66%). El modelo elaborado y sus coeficientes para confeccionarlo fueron: $f(x) = 1,322 + (2,173 \text{ distancia tiromentoniana} < 6,5 \text{ cm}) + (1,813 \text{ epiglotis abarquillada}) - (1,310^* \text{ cm abertura boca})$. El poder global de discriminación era 0,83 (IC 95%: 0,70–0,95).

Conclusiones: La laringoscopia indirecta permitió el diagnóstico de las anomalías faringolaríngicas, y de ellas la epiglotis abarquillada fue una de las variables incluidas en el modelo de regresión logística.

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Introduction

The Mallampati scale, dental anomalies, macroglossia and tonsillar hypertrophy are the most common predictors of difficult airway (DA). Nevertheless, indexes such as that developed by Arné¹ have low sensitivity and specificity for predicting DA in ENT surgery patients. For this reason, preoperative upper airway (UA) examination of ENT surgery patients by means of indirect laryngoscopy (IL) using a nasal fibroscope or rigid laryngoscope will show any pathological abnormalities present, predict DA, and allow surgeons to choose the best intubation method.^{2–4}

Pharyngolaryngeal anomalies such as those involving the epiglottis^{3,5–7} and tonsillar hypertrophy (TH)^{7–9} can be found at any time in patients undergoing general anesthesia (GA), and can also contribute to DA. Epiglottic anomalies¹⁰ can be divided into: curved, floppy and hypertrophic (or leaf shaped). These anomalies are only detected if patients undergo preoperative IL examination of the UA.^{3,6,8} A recent study¹¹ reported using a laryngeal mirror to predict difficult intubation (DI) in obese patients. The mirror technique was compared with the results of other tests, finding that it was more discriminatory, although no mention was made of anomalies that could contribute to DI prediction. The rigid laryngoscope has only recently been introduced in ENT departments for UA examination. In addition to other advantages over the conventional laryngeal mirror (greater patient comfort, short learning curve), it allows clinicians to

record the examination. The recording can then be viewed to determine the presence of anomalies.^{3,4}

The main aims of this study were to diagnose patients with pharyngolaryngeal anomalies only visible on preoperative rigid indirect laryngoscopy, and to study the importance of these anomalies as DI predictors in relation to other demographic and clinical predictors. The secondary aims were to determine whether our intubation protocol would be altered on the basis of the IL examination, and whether diagnosis of the anomalies found on IL differed between anesthesiologists and otolaryngologists.

Materials and methods

This prospective observational study was approved by our hospital's ethics committee and carried out between September 2009 and November 2010 in 300 patients scheduled for surgery under GA with tracheal intubation. All prospective patients signed an informed consent form prior to inclusion in the study. Exclusion criteria were: aged under 18 years, unable to sit upright, ankylosing spondylitis, nasogastric tube in place, heart disease or infections such as hepatitis, HIV or TB, emergency or obstetric surgery, or recent neck surgery.

The same protocol was followed in all patients; on entering the surgery unit on the day of the intervention, the anesthesiologist reviewed the preoperative examination

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