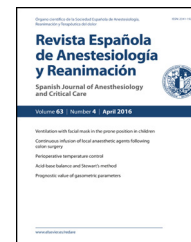




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ORIGINAL ARTICLE

A predictive test for difficult intubation in laryngeal microsurgery. Validation study[☆]

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KEYWORDS

Difficult intubation;
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Abstract

Background: In 2003 a simple test to detect difficult intubation (DI) in patients underwent laryngeal microsurgery was described. The present study was conducted to validate the test.

Methods: Patients with laryngeal disease scheduled for laryngeal microsurgery were included. The variables evaluated were eleven parameters: Mallampati Score \geq III, thyromental distance $<$ 6.5 cm, mouth opening $<$ 40 mm, limitation of the temporomandibular joint, pathological dentition, arched paladet, maxillary deficiency, neck mobility $<$ 90°, body mass index, symptoms of laryngeal dysfunction, and tumour of supraglottic region. A rapid examination of the airway by an expert anaesthesiologist was carried out just before induction. DI was defined by a Cormack laryngeal view grade III–IV and/or if auxiliary equipment was required to achieve orotracheal intubation. A comparison of ROC curves was conducted to estimate the best predicting cut-off, as well as differences between the index described in 2003 and the rapid assessment by an expert anaesthesiologist.

Results: One hundred and five patients were included in the study. The incidence of DI according to the predefined criteria was 45% (47 patients). The score at the cut-off of 5 provides a sensitivity of 89% and a specificity of 55%. The fast-evaluation by an expert anaesthesiologist obtained similar sensitivity (89%) and better specificity (81%). Area under curve (AUC) was 0.87, similar to a fast evaluation (AUC: 0.85; $P = .71$).

Conclusion: The index was validated at a cut-off of ≥ 5 , being a useful and reliable test to predict DI in patients with laryngeal diseases and it is a useful tool for anaesthesiologists with conventional training.

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PALABRAS CLAVE

Intubación difícil;
Microcirugía laríngea;
Manejo vía aérea

Test predictivo de intubación difícil en microcirugía de laringe. Estudio de validación**Resumen**

Introducción: En el año 2003 nuestro grupo describió un test simple para la detección de intubación difícil (ID) en pacientes sometidos a microcirugía de laringe. El presente estudio se ha realizado para validar dicho test.

Métodos: Se incluyeron pacientes con patología de laringe sometidos a microcirugía laríngea. Las variables puntuadas fueron el test de Mallampati \geq III, la distancia tiromentoniana $<$ 6,5 cm, la apertura bucal $<$ 40 mm, la movilidad de la articulación temporomandibular, la dentición patológica, la presencia de paladar ojival, la movilidad del cuello, deficiencia maxilar, el índice de masa corporal, los síntomas de disfunción laríngea y la localización supraglótica de la lesión laríngea. Además se realizó un examen rápido de la vía aérea por el anesthesiólogo experto en el área, justo antes de la inducción. Se definió como ID la visión de la glotis Cormack grado III-IV obtenida por laringoscopia directa y/o el requerimiento de algún equipo auxiliar para lograr la intubación orotraqueal. Se utilizaron curvas ROC para estimar el valor de corte con mejor predicción para ID, y se evaluaron las diferencias entre el índice descrito en 2003 y la valoración rápida por un anesthesiólogo experto.

Resultados: La incidencia de ID, de acuerdo con los criterios predefinidos, de los 105 pacientes estudiados fue del 45% (47 pacientes). Para un valor de corte \geq 5 del test se obtuvo una sensibilidad del 89% y una especificidad del 55%. La evaluación rápida por un anesthesiólogo experto obtuvo una sensibilidad similar (89%) y una mejor especificidad (81%). El área bajo la curva (AUC) fue de 0,87, similar a la de la evaluación rápida por el anesthesiólogo (AUC: 0,85; $p=0,71$).

Conclusión: El test para un valor de corte \geq 5 se validó como una prueba válida y fiable para predecir ID en pacientes con enfermedades de laringe, siendo una herramienta útil para los anesthesiólogos con formación convencional no expertos en esta área.

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Introduction

Difficulty in airway management and its assessment has been changed in the last years. Algorithms for detecting difficult intubation (DI) have been defined and modified depending on new tools like videolaryngoscopes, fiberoptic bronchoscopes or improved supraglottic devices. Despite these advantages, the ability of the anaesthesiologist to detect DI prior to induction, to establish proper strategy for intubation is the key point in avoiding deleterious effects in patients undergoing general anaesthesia.¹

Nowadays, the laryngeal surgery for the most of patients is performed by transoral laser microsurgery. It is of utmost importance in laser microsurgery to achieve orotracheal intubation (OTI), since the tumour excision removes the laryngeal obstacle and considerably improves respiratory function.^{2,3} As such, performing a tracheostomy with the sole aim of achieving intubation is only justified in extreme cases. OTI may be challenging in patients who have an anatomic alteration of the superior airway and a laryngeal obstruction due to a tumour, thus, it is considered as a difficult airway (DA). In any case, it is accepted that the concept of DA is an interaction between specific factors of each patient, associated pathology, the emergency of the situation and the degree of training and ability of the anaesthesiologist.^{4,5}

There are many predictive tests useful in general populations which value classical parameters of DI such as Mallampati, thyromental distance, mouth opening neck extension, etc.⁶⁻⁸ The individual signs of DI have a poor predictive value that are modelled using complex interaction among single variables, thus enabling accurate predictions.⁹

However the predictive test applications in the general population are not adequate for use in patients with laryngeal disease in whom the incidence of DI is greater.^{4,10-12}

In 2003 a simple score was described by our group to identify patients who underwent larynx microsurgery with high risk of DI.¹³ The index included classical factors associated with DI, but also, specific factors in this population. This index which has been called the "Barcelona Score" has not been validated in prospective group of patients. Moreover, clinical experience in management of these patients must be important to identify the risk of DI and it has not been compared with the score.

A study to validate the "Barcelona score" was conducted to estimate the risk of DI in patients with laryngeal pathology and compare this index with a fast clinical airway evaluation just prior to induction by an expert anaesthesiologist in laryngeal surgery. The purpose of the test is to warn conventional anaesthesiologists of possible DI, and to establish an optimal plan to intubate patients with maximum safety.

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