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Marta Sofia Penso de Barros

A Prospective Study to Compare Patient Laryngo-pharyngeal Complaints after Laryngeal Mask Airway versus Orotracheal Tube Insertion

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Resumo

CONTEXTO: As queixas laringofaríngeas são frequentes no pós-operatório após abordagem da via aérea.

OBJETIVO: No nosso estudo pretendemos comparar a incidência de dor de garganta, disfonia, disfagia e lesões traumáticas dos tecidos moles entre os pacientes submetidos a entubação orotraqueal e máscara laríngea.

TIPO DE ESTUDO: Estudo prospectivo observacional.

LOCAL: Num único centro hospitalar entre Setembro de 2011 e Dezembro de 2011.

PARTICIPANTES: Foram avaliados 48 pacientes de ambos os sexos (idade compreendida entre 19-85 anos), que foram submetidos a cirurgia electiva sob anestesia geral. Critérios de exclusão foram: idade inferior a 18 anos, história recente de dor de garganta, cirurgias da cabeça e pescoço, disfonia pré-operatória e cirurgia de emergência.

INTERVENÇÃO: Avaliamos 48 pacientes: 26 foram submetidos a entubação orotraqueal (54%) e em 22 foi usada a máscara laríngea (46%). A seleção da técnica de abordagem da via aérea ficou à responsabilidade do anestesiologista que era cego para o estudo. Foi seguido o protocolo hospitalar para controlo da dor pós-operatória.

MEDIDAS PRINCIPAIS: No recobro, 4h a 24h depois da cirurgia os pacientes foram questionados sobre a presença de dor de garganta, disfonia e disfagia. A boca foi inspeccionada para avaliação de lesões nos lábios, língua e úvula.

RESULTADOS: Após entubação orotraqueal 46% dos doentes queixaram-se de disfonia assim como 50% dos doentes referiram o mesmo sintoma após a utilização de máscara laríngea (p=0.79). A disfagia foi mais frequente após entubação orotraqueal comparativamente à inserção da máscara laríngea (15,4% vs 9%, p=0.67). Relativamente à dor de garganta foi relatada por 31% dos pacientes do grupo de entubação orotraqueal, enquanto que 14% do grupo de máscara laríngea referiu este sintoma (p=0.29).

CONCLUSÃO: A disfonia após o uso da máscara laríngea é mais frequente que a reportada em estudos anteriores. As duas técnicas de abordagem da via aérea, máscara laríngea e tubo orotraqueal, são semelhantes nas variáveis estudadas.

Palavras-Chave: Máscara laríngea; Entubação orotraqueal; Laringoscopia; Anestesia geral; Dor de garganta; Disfonia; Disfagia; Trauma de tecidos moles.

A Prospective Study to Compare Patient Laryngo-pharyngeal Complaints after Laryngeal Mask Airway versus Orotracheal Tube Insertion

Running title: Assessing Patient Complaints After Airway Management

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Abstract

CONTEXT: Postoperative laryngo-pharyngeal complaints are common following airway management of patients.

OBJECTIVE: In this study we compare the incidence of sore throat, dysphonia, dysphagia and soft tissue trauma between patients underwent endotracheal tube and laryngeal mask airway.

DESIGN: This was a prospective observational study.

SETTING: In a single university between September 2011 and December 2011.

PATIENTS OR OTHER PARTICIPANTS: 48 patients evaluated, both genders (aged 19-85 years) who were submitted to elective surgery under anesthesia general. Exclusion criteria were: age under 18 years old, recent history of sore throat, head and neck surgeries, preoperative dysphonia and emergency surgery.

INTERVENTION: We evaluated 48 patients: 26 underwent endotracheal tube (54%) and 22 laryngeal mask airway (46%). Selection of the airway technique was up to the anesthesiologist's choice that was blind for this study. Postoperative analgesic management followed hospital protocol.

MAIN OUTCOME MEASURES: In the recovery room, 4h to 24h after the surgery the patients were asked about the existence of sore throat, dysphonia and dysphagia. The mouth was inspected for any damage in the lips, tongue and uvula.

RESULTS: Dysphonia was felt in 46% of the patients after endotracheal tube and 50% after laryngeal mask airway patients (p=0.79). Dysphagia was higher following endotracheal tube compared with laryngeal mask airway insertion (15,4% vs 9%, p=0.67). Sore throat was reported by 31% of patients in the endotracheal tube group and 14% of the laryngeal mask airway group (p=0.29).

CONCLUSIONS: Dysphonia following laryngeal mask airway seems to be more frequent than previously reported in other studies. Both airway devices, laryngeal mask airway and endotracheal tube, are similar in the studied variables.

Keywords: Laryngeal mask airway; Endotracheal tube; Laryngoscope; Anaesthesia general; Sore throat; Dysphonia; Dysphagia; Soft tissue trauma.

Introduction

Laryngeal Mask Airway (LMA) is a well-established alternative airway access to endotracheal tube (ETT) for elective surgical procedures and it can be inserted without the aid of a laryngoscope or neuromuscular blockade.

Postoperative airway complications such as sore throat, dysphonia and dysphagia (discomfort in swallowing) are common complaints following either ETT or LMA.(1) Bilateral vocal cord palsy is a possible complication associated with the use of LMA.(2)

In this prospective clinical study we compared the incidence and severity of sore throat (constant pain), dysphonia and dysphagia from LMA or ETT. The severity of all symptoms was assessed on a 10 point numerical rating scale. In our study, a standardized questionnaire with direct questions was used.

Previous studies have associated endotracheal intubation with a greater incidence of sore throat and dysphonia than LMA with complaints limited in their intensity and duration.(3-5) The incidence of sore throat due to LMA varies between 5.8-34%, and after ETT between 14.4-50% in another study.(6) This difference is presumably due to different techniques and different skillset of the performing anesthesiologists and will also change depending on different types of questionnaires. It is well recognized that the method of questioning is an important determinant of the incidence of sore throat, with incidence varying if this symptom is asked about directly or indirectly.(4, 6, 7)

The LMA does not transverse the vocal cords and therefore, the incidence of dysphonia is less than that induced by ETT.(8) In some cases, there is a direct contact of the LMA with the vocal chords and the arytenoid cartilage, leading LMA to induce dysphonia.(8) LMA associated dysphonia can also arise from the inhalation of cold and dry inspiratory gases passing through the vocal chords and from the air flow during positive pressure ventilation which can cause involuntary vibration thus irritating the unparalyzed vocal chords possibly leading to postoperative dysphonia.(5, 9)

When evaluating dysphagia, the incidence is 23.8% with LMA and 12.5% in ETT.(5) In our literature review, dysphonia is lower with LMA 0-25.3% compared to ETT which varies between 25-46.8%. (5, 10, 11)

Several studies have identified numerous risk factors related with impaired laryngeal mobility following ETT such as endotracheal size, cuff pressure, use of N_2O (diffuses through the tube's cuff), demographic factors (women), duration of anaesthesia, type of surgery and quality of tracheal intubation.(12) The incidence and severity of the complications increases with the difficulty of the intubation. Hematomas and lacerations can also be caused by the passage of the endotracheal tube through the vocal chords.

Methods

An approval form the institutional Ethics Committee of the Hospital of S. João, Oporto, Portugal on September 29th 2011 was obtained as well as an informed written consent from American Society of Anesthesiologists (ASA) physical status I, II and III patients of both genders who were included in the present study. All patients were scheduled for elective surgery under general anaesthesia and with ages between 19 to 85 years old. The surgical procedures included in the study were general surgery, orthopedic, gynecological and vascular surgery. We gathered data from 48 patients, 26 underwent ETT (54%) and 22 LMA (46%).

As this investigation was a non-randomized prospective study, the recruitment of patients did not interfere with the everyday routine so the medical and organization conditions remained unchanged.

We recorded the patient´s age, sex, body mass index (BMI), and ASA physical status on a standardized information sheet (Table 1). The type and duration of surgery and operative airway management (ETT or LMA) were also recorded.

Patients under 18 years old, with a recent history of sore throat, undergoing head and neck surgeries, presenting with preoperative dysphonia and emergency procedures were excluded from the study.

Demographic characteristics such as age, sex, and BMI are similar between both groups.

Duration of surgery was evaluated with the surgical time differing between the ETT and the LMA groups.

The choice of airway access was decided by the anesthesiologist as well as the anesthetic agents used based on their assessment of the patient, personal preference, and experience with airway techniques. A 6.5mm to 8mm ETT for woman and 7mm to 8mm for men were used in the ETT group. A size 3 or 4 LMA were used for woman and size 4 or 5 were used for men, according to the patient´s weight.

In the Laryngoscope group a direct classic Macintosh laryngoscope was placed except in one patient who was intubated with a McCoy Laryngoscope.

For the ETT group, the endotracheal tube was placed after laryngoscopy using standard techniques.

In the LMA group, the cuff was inflated with air to ensure sealing of airway. Proper placement of the airway was confirmed by bilateral equal air entry on auscultation, normal rectangular shape capnograph tracing and visible chest rise.

No constraint was placed on the technique of general anesthesia so that the anesthesiologists were free to perform the procedures as they intended to. Induction regimens varied widely according to anesthesiologist preference. The usual hypnotic anaesthetics were used. Rocuronium or Cisatracurium were used only in the ETT group to facilitate tracheal intubation. No muscle relaxants were used the LMA group.

All patients were monitored using electrocardiography, pulse oximetry, non-invasive blood pressure, end-tidal CO_2 analysis and airway pressure.

At the end of surgery the residual neuromuscular blockade was reversed with neostigmine and atropine when clinically necessary.

Postoperative analgesic management was comparable in the two groups because the departments established routines were followed. All the patients systematically received the same protocol of postoperative analgesia, based on intravenous paracetamol (1g 8/8h) and parecoxib (40mg/day). In addition, when patients complained of pain [Visual Analogue Scale (VAS) >3/10 despite paracetamol and parecoxib administration], they received tramadol (100mg 8/8h) or morphine (2mg ev every 10min, with a maximum dose of 6mg).

After removal of the airway device in the operating room when patients were able to open their eyes to command, they were transferred to the post-anesthesia care unit (PACU).

In the recovery room, 4h to 24h after surgery, the oral cavity was inspected for any damage and pain in the lips, tongue and uvula. Oral opening width,

Mallampati classification, anatomical changes in the head and neck region as well as neck extension (normal or limited) and thyromental distance (Patil-Aldreti test) were assessed. Patients were asked directly whether they had sore throat, and whether they had any dysphonia and dysphagia. Sore throat was defined as continuous throat pain regardeless swallowing, dysphonia was defined as impairment in the ability to produce vocal sounds and dysphagia was defined as any discomfort during swallowing. We evaluated laryngeal complaints with the following score: 0 - absent, 1 - present. If patients had pain we used a visual analogue scale (0 – no complaint, 10 – worst imaginable complaint). Dysphonia was also categorized as absent or present. The need of medication for pain relief was also recorded.

The interview was carried out by the same person and always followed a standardized pattern. The incidence of laryngo-pharyngeal complaints was noted by using standardized direct questions.

Statistical analysis was performed using SPSS statistics program version 20.0.0. Normal distribution of samples was determined by the Kolmogoroff-Smirnoff test. Significant differences of quantitative variables of independent samples were tested by Student´s t-test and Mann-Whitney test. Significant differences between groups for binomial variables were tested by Chi-Square test or Fisher´s exact test. In all cases, statistical significance was assumed to be $p<0,05$.

Results

We analyze 48 patients: ETT was used in 54.2% and LMA in 45.8% patients. Four patients were excluded from the study, one patient refused to participate and another 3 were outside the inclusion criteria. Median age in both groups was 56.1±15.4 SD years and two thirds (66%) of the patients were female.

There were no significant differences between the groups with respect to age, gender and BMI. Potential risk factors for difficult intubation such as Mallampati score, inter-incisor gap, neck circumference, head and neck flexion and extension, jaw configuration and thyromental distance were similar in both groups. (Table 2)

Surgical procedure, ASA physical status and Mallampati classification differ between both groups, a lesser degree of ASA physical status was seen in the LMA group as well as a lower scoring Mallampati score (score I,II and only one patient III) in contrast with the ETT group. (Table 1)

In our study, the overall incidence of postoperative sore throat was 23%, dysphonia 47.9% and dysphagia 12.5%.

All 22 LMA insertions were performed by specialists, in the ETT group 6 intubations were performed by interns and 18 by specialists.

The mean duration of surgery was longer in the ETT group (120 min ±38.4 vs 34 min ±15.8)($p<0.05$). In our study, the duration of surgery, didn´t correlate with laryngeal complaints: sore throat ($p=0.254$), dysphagia ($p=0.849$), dysphonia ($p=0.488$) and tissue lesions ($p=0.454$).

Of the 48 patients, 23% reported a sore throat. That was more frequent following ETT than following LMA (31% vs 14%, $p=0.29$).

The average pain score, calculated from all 48 patients and expressed on a scale from 0 to 10 (Visual Analogue Scale=VAS), was 0.89 ±1.7. This very low result is misleading, as the data from the 37 who indicated no sore throat at all (value=0) has been included. Excluding value=0, the average pain score from

11 patients who indicated sore throat was 3.55±1.44. The severity of the individual complaints of laryngo-pharyngeal morbility, assessed on VAS, was comparable between groups. (Table 3)

Surprisingly, dysphonia occurred more commonly in the LMA group than in the ETT group (50% vs. 46%, p=0.79). In all cases, except for one in the LMA group, dysphonia was considered by the patients to be mild. Only one patient in the LMA group reported severe dysphonia (aphonia) that was transitory and resolved spontaneously.

The incidence of dysphagia was higher following ETT compared with LMA insertion (15.4% vs 9%, p=0.67).

In our study we found a close relation between dysphagia and other laryngeal complaints. We witnessed that dysphagia complaints are always associated with sore throat (p=0,00) as well as dysphonia (p=0,01). No other relation between laryngeal complaints was found.

Soft tissue trauma in lips, soft palate and uvula in the ETT group was seen in 30.7% of cases and in 18.2% of cases in the LMA group (p=0.50). We did not detect any dental injury in any patient.

We found a higher incidence of sore throat in women than in men (25% vs 18.8%, p=0.73) although in our study, more men complained of dysphagia (18.8% male and 9.4% female, p=0.38) and of dysphonia in regards to women (56.2% vs 43.8%, p=0.61).

The ETT group had more cases of sore throat, dysphagia and soft tissue trauma (lips, uvula, tongue or soft palate) than the LMA group.

Merely assessing for sore throat, dysphonia and dysphagia, we found that the simultaneous occurrence of the three symptoms is higher in the ETT group than the LMA group (p=0.67) (Table 4)

Discussion

The aim of this study was to assess which device, LMA or ETT, is most useful to reduce postoperative sore throat, dysphonia and dysphagia after general anesthesia, under clinical routine conditions. In our study, a standardized questionnaire was made face to face with the patients and direct questions were used. We compared demographic characteristics of the patients, as ASA score and surgical procedures.

The LMA is positioned in the hypopharynx and the major advantages of this are its easy insertion, minimal contact with the vocal cords, absence of any residual discomfort and stress of laryngoscopy and avoiding muscle relaxants. Use of ETT requires administration of muscle relaxants for insertion and other agents for reversal of the effects of the latter.

In our study, all patients subjected to ETT placement used neuromuscular blockade, showing evidence of a significantly lesser proportion of patients who had postoperative dysphonia in the group with the relaxant induction regimen (13). In the LMA group neuromuscular blockade wasn´t used in any patient.

Complications secondary to endotracheal intubation include sore throat, dysphagia, dysphonia and trauma of the lips and oropharynx. The passing of the ET tube through the vocal chords can cause hematomas and lacerations, and visible laryngeal trauma occurs in 6% of cases due to endotracheal intubation, that was similar to what was found in our study.(14)

Laryngeal morbidity may not only occur during intubation, but may also be the result of intraoperative factors. The literature describes that increasing duration of surgery led to an increased incidence of postoperative dysphonia, mainly because of mucosal damage caused by the endotracheal intubation, however, we found no relation between surgical time and the onset of laryngeal complaints.(5, 8) The baseline incidence of postoperative dysphonia has been reported to exist independently of the quality of tracheal intubation, which could explain why laryngeal damage could be observed in some patients despite optimal intubation conditions.(13)

Approximately 46% of ETT patients demonstrated dysphonia after surgery and this is comparable with previous findings. (5, 10) However, dysphonia following surgery was also present in about 50% of LMA patients, something not found by others. (5, 8, 10, 11) Riger et al. found that in the LMA group complaints of dysphonia were less frequent, but dysphagia was more frequent. (5) However, the study by Rieger et al, Figueiredo et al and Seung H et al and our study were of the few that assessed dysphonia after LMA placement. In our study the pressure cuff wasn´t measured and this could be an explanation of this findings.

It is known from fiberoptic studies that direct contact of the LMA with the vocal cords and the arytenoid cartilage may occur, leading to airway complications like pharyngeal erythema, nerve palsies such as recurrent laryngeal, hypoglossal and lingual nerve with vocal cord palsy, arytenoid dislocation, epiglottitis, uvular bruising. (2, 6, 15) Vocal cord paralysis can also be associated with tracheal intubation. Direct trauma to the vocal cords by the LMA is uncommon, it is presumed that the cold and dry inhalation of anesthetic gas in positive pressure ventilation that passes over the vocal cords may substantially contribute to the transient impairment in vocal production following a LMA. (12)

Postoperative sore throat complaints frequently arise after management of airway for general anesthesia, but they are of limited intensity as in our study, all patients complained of mild pain. (3) Our results concerning intensity of sore throat corresponded well with the results found in the literature. Sore throat is a common symptom and it can be attributed to ischemia-reperfusion injury, local inflammatory reaction, or abrasion.

After endotracheal intubation, the incidence of sore throat varies from 14.4% to 50% and after laryngeal mask insertion from 5.8% to 34%. (6) In our study, the incidence of sore throat in the ETT group is approximately double that of sore throat in the LMA group (31% vs 14%), similar to what's described in the literature. (1, 4, 11, 16) This finding is in contrast with the findings by Rieger A. et al that reports an incidence of sore throat that did not substantially differ between groups.(5)

Dysphagia is seen more often following ETT management than following LMA in our study, the presence of this complaint doesn´t deter from eating in any of the patients.

Studies resorting to fibro-laryngoscopy have shown that abnormalities such as oedema and laryngeal ulcerations can by themselves compromise laryngo-faryngeal sensibility and harm the airway protection mechanism during swallowing. (15)

The higher the intubation difficulty is, the higher the incidence and severity of the following complications. Difficult intubation occurs in 1-18% of cases but, in our study no such case was reported. (17)

In our study we compared several independent risk factors associated with difficult intubation such as Mallampati score, inter-incisor distance, thyromentonian distance, jaw configuration, head and neck flexion and neck circumference. We found no differences between both groups that would justify the higher reports of sore throat and dysphagia in the ETT group, because these characteristics were in the normal range.

Many different variables can influence the incidence of the postoperative sequelae. Postoperative sore throat following anesthesia with LMA is multifactorial and its incidence can be influenced by the depth of anesthesia at the moment of insertion, the method of insertion, the number of attempts at placement, and also has been attributed to N_2O diffusion through the cuff wall, cuff lubrication, and warming and humidifying anesthesia gases.(8) During anesthesia with the LMA, continuous cuff pressure increases can frequently be seen due to N_2O diffusion in the cuff. The pressure exerted by the cuff against surrounding pharyngeal structures can exceed the capillary perfusion pressure and is seen as a decrease of pharyngeal perfusion.(2, 8, 18) However in our study, the cuff pressure wasn´t evaluated because the anesthesiologist was blind for the study and this parameter wasn´t taken into account.

Many studies have identified several risk factors related with laryngeal mobility following ETT in which endotracheal size, cuff design, cuff pressure, use of N_2O, demographic factors (woman), duration of anaesthesia, type of surgery

and quality of tracheal intubation and postoperative nausea and vomiting, general morbility of the patient, is also associated with technical difficulty. (3, 12, 19)

The laryngo-pharyngeal complaints after surgery such as sore throat and dysphagia could indicate bleeding, oedema, or more serious complications like perforation of the esophagus or trachea.(16)

Our overall incidence of post-intubation laryngeal complaints for the LMA group was 55.5% and for the ETT group was 57.7%.

Female patients had more sore throat complaints than male patients (25% vs 19%), but lower dysphonia and dysphagia, and this could be explained by a smaller larynx.

Although there is a chance for lower risk of airway complications when an LMA is used because its superior placement in the larynx could result in less irritation to the vocal cords and trachea, but surprisingly we found otherwise. Our study has demonstrated that using the LMA instead of the ETT leads to diminished postoperative sore throat and difficulty in swallowing, but an increase of hoarse voice. No patient required medication for laryngeal complaints.

Limitations of our study were: a small sample size; underestimation of sore throat in both groups because the questionnaire was performed in the first 24 hours after surgery, which could lead to lower incidence of this symptom since the patients are still under the effects of post-operative analgesia.

We came to the conclusion that sore throat and dysphagia were more frequent after ETT. Dysphonia following LMA seems to be more frequent than previously reported. We described one case of LMA group with severe dysphonia (aphony). There were minimal differences between both groups, the advantage of the LMA vs ETT with regards to these parameters is questionable.

In our study we found that all patients with dysphagia also had dysphonia and pain. We thus hypothesize that the presence of dysphonia could represent an aggression to the oesophageal mucosa and adjacent structures suggesting a more serious injury, although transitory and of self-resolution in nature. Thus,

we should expect to find in patients presenting with dysphagia associated simultaneous dysphonia and pain. Taking in to account that these last symptoms are more frequent, perhaps a lesser extent of injury is necessary during intubation to cause them.

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Anexo 1

TABLE 1 Anthropometric and Peroperative Data

	LMA group (n=22)	ETT group (n=26)	P – value*
Age (years)	51,55±10,57SD	60,0±17.90SD	0.058
Gender Female Male	 16 (72,7%) 6 (27,3%)	 16 (61,5%) 10 (38,5%)	0.609
BMI (Kg/m^2)	28,1±4,9	29,4±7,3	0.535
ASA physical status I II III	 11 (50%) 9 (41%) 2 (9%)	 0 (0%) 22 (85%) 4 (15%)	0.00
Mallampati I II III IV	 14 (63,6%) 7 (31,8%) 1 (5%) 0 (0%)	 9 (34,6%) 6 (23,1%) 7 (27%) 4 (15,4%)	0.023
Duration of Surgery (min)	34±15,8	120±38,4	0.00
Surgical procedure General Surgery Ginecological Orthopedic Vascular	 3 (13,6%) 6 (27,3%) 1 (5%) 12 (55%)	 26 (100%) 0 (0%) 0 (0%) 0 (0%)	-

*Statistical tests used: Chi-Square test, Mann Whitney test and Independent Sample T-test.

BMI – Body Mass Index; ASA - American Society of Anesthesiologists

TABLE 2

Potential Risk Factors for Difficult Intubation

	LMA group (n=22)	ETT group (n=26)
Inter-incision gap (cm)	5.35±0.82 SD	5.95±0.91 SD
Neck circumference (cm)	39.55±3.36 SD	42.20±5.64 SD
Head and neck flexion >90° <90°	 22 (100%) 0 (0%)	 22 (92.3%) 2 (7.7%)
Retrognathism Normal Prognathism	1 (4.5%) 20 (91%) 1 (4.5%)	0 (0%) 26 (100%) 0 (0%)
Thyromental distance (cm)	6.75±0.63 SD	6.77±1.19 SD

TABLE 3

Laryngeal Complaints

	LMA group (n=22)	ETT group (n=26)	P – value
Sore throat VAS*	3 (14%) 3,67±1.53	8 (31%) 3,5±1,51	P = 0.288**
Dysphonia	11 (50%)	12 (46%)	P = 0,790**
Dysphagia	2 (9%)	4 (15,4%)	P = 0,674***
Soft tissue trauma (lips or uvula or soft palate)	4 (18,2%)	8 (30,7%)	P = 0,503**

*VAS – visual analogue scale

** Chi-Square test

*** Fisher´s Exact test

TABLE 4

Number of Symptoms of Laryngo-pharyngeal complaints (Sore throat, dysphonia and dysphagia) in patients with LMA and ETT

Number of symptoms*	LMA group (n=22)	ETT group (n=26)	P – value**
0	10 (45.5%)	11 (42.3%)	P = 1.00
1	10 (45.5%)	10 (38.5%)	P = 0,770
2	0 (0%)	1 (3.8%)	P = 1.00
3	2 (9.1%)	4 (15.4%)	P = 0,674

*Including dysphonia and/or dysphagia and/or sore throat. “0” symptoms mean that none of these three complaints are present.

** Chi-Square Test and Fisher´s Exact Test.

Anexo 2

Avaliação do dano orofaríngeo no pós-operatório

1. **Nº Processo:** **Nº Codificador:**

2. **Data do exame:** ____ **/** ____ **/** ____
3. **Sexo: 1-** Masculino _____ **2-** Feminino _____
4. **Idade** ____ anos

5. **Dor** **1-** Prévia → exclusão
   2- Pós-op: 1) Sem dor ___
   2) Gengiva/Mucosa (úvula/palato) ___
   3) Odinofagia ___ Classificação VAS ___

6. **Disfonia** **1-** Prévia → exclusão
   2- Pós-op: 1) Ligeira ___
   2) Grave ___

7. **Disfagia** **1-** Prévia → exclusão
   2 – Pós-op ___

8. **1- Peso** ____ Kg; **2- Altura** ____ m **3- IMC** ____

9. **Classificação de Mallampatti:** **1-** Grau I __ **2-** Grau II __ **3-** Grau III __ **4-** Grau IV __

10. **Largura do pescoço:** _____ cm

11. **Distância tiromentoneana:** _____ cm

12. **Abertura máxima da boca:** _____ cm

13. **Mobilidade do pescoço:** **1-** <90° ___ **2-** >90° ___

14. Configuração Mandibular: 1- Normal ___

2- Retrognatismo ___

3 - Prognatismo ___

15. Avaliação de lesões na úvula: 1- Presentes ___ **2-** Ausentes ___

Registos Anestésicos

1. Tipo de Intubação:

1- Máscara Laringea ____

2- Laringoscopia ____

2.1 – Intubação Difícil: 1- Sim ___ 2 - Não___

2.2 – Nº. de Tentativas da Intubação ____

2.3 – "Intubador": 1- Especialista ____ 2- Interno ____ (ano de internato)

2.4 – Lâmina utilizada:1-McKintosh __ 2-Miller __ 3-MCCoy __ 4-Outro__

2.5 – Intubação sob relaxamento muscular: 1- Sim ____ 2- Não ____

2. Tempo da Cirurgia _____

3. Classificação ASA

3.1 – I ___

3.2 – II ___

3.3 – III ___

3.4 – IV ___

4. Patologia Associada: **1 -** Sim ____ Qual? _____

2 - Não ____

5. Necessidade de analgesia no pós-operatório devido à presença de odinofagia/disfagia:

5.1 – Sim ____ Qual? _____

5.2 – Não ____

Anexo 3

DECLARAÇÃO DE CONSENTIMENTO

Eu, abaixo-assinado,_____

_____,declaro que compreendi a explicação que me foi fornecida acerca da investigação que se tenciona realizar, bem como do estudo em que serei incluído/a. Foi-me dada a oportunidade de fazer as perguntas que julguei necessárias, e de todas obtive resposta satisfatória.

Além disso, foi-me afirmado que tenho o direito de recusar a todo o tempo a minha participação no estudo, sem que isso possa ter como efeito qualquer prejuízo na assistência que me é prestada.

Por isso, estou interessado/a em participar no estudo.

Data: _____ / _____ / _____

Assinatura do doente_____

Trabalho de Tese de Mestrado Integrado em Medicina por:

Marta Sofia Penso de Barros

Assinatura:

_____

Orientada por:

Mestre Joana Irene de Barros Mourão

Anexo 4

À Direcção Clínica 1T/11
26/9/11

SÃO JOÃO HOSPITAL

- Hospital São João -
Paulo Pattencourt
Adjunto da Direcção Clínica

AUTORIZADO

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(Presidente do Conselho de Administração)

Directora Clínica | Enfermeira Directora | Administrador Executivo | Administrador Executivo

Dra. Margarida Tavares | Enfermeira Eurídice Pereira | Dr. João Oliveira | Dr. Ricardo G. Matos

Exma. Sra.
Dra. Margarida Tavares
Directora Clínica do Centro Hospitalar de São João

Assunto: Parecer da Comissão de Ética para a Saúde do Centro Hospitalar de São João

Projecto de Investigação: "*Estudo comparativo entre a introdução de máscara laríngea e intubação orotraqueal por laringoscopia*"
Investigadora Principal: Marta Sofia Penso de Barros

Junto envio a V. Exa. para obtenção de decisão final do Conselho de Administração o parecer elaborado pela Comissão de Ética para a Saúde relativo ao projecto em epígrafe.

Com os melhores cumprimentos.

Porto, 23 de Setembro de 2011

Dr. Pedro Brito
Secretário da Comissão de Ética para a Saúde

Anexo 5

Guidance for Authors on the Preparation and Submission of Manuscripts to the European Journal of Anaesthesiology

Note: These instructions comply with those formulated by the International Committee of Medical Journal Editors (ICMJE). For further details, authors should consult the following article: International Committee of Medical Journal Editors. "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" *New Engl J Med* 1997, **336**:309–315. The complete document appears at http://www.icmje.org.

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The *European Journal of Anaesthesiology* (EJA) publishes original work of high scientific quality in the field of anaesthesiology, pain, emergency medicine and intensive care. Preference is given to experimental work or clinical observation in man, and to laboratory work of clinical relevance. The journal also publishes commissioned reviews by an authority, abstracts of scientific meetings, editorials, commentaries, special articles and correspondence are also included.

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Acknowledgements
We would like to thank Dr John A. Smith for his assistance with the study.

Conflicts of interest and sources of funding

This work was supported by the Department of Anaesthesiology, London Hospital, London, UK.

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Number references consecutively in the order in which they are first mentioned in the text. Identify references in the text, tables and legends using superscripted Arabic numerals that are placed after the punctuation. References cited only in tables or in legends to figures should be numbered in accordance with the sequence established by the first identification in the text of the particular table or illustration.

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Authors are requested to submit these as ‘Original articles’ (not ‘Reviews’) and report them in accordance with the PRISMA (Transparent Reporting of Systematic Reviews and Meta-Analyses) Statement [www.prisma-statement.org]. This ensures that enough information is provided for editors, peer reviewers, and readers to see how the study was performed and to judge whether the findings are likely to be reliable (see EJA Editorial: Adherence to guidelines for improved quality of data reporting: where are we today?). Please provide the following:

- A flow chart showing the progress of retrieved reports through the review
- A checklist for editors and reviewers (not for publication) showing that you have described the recommended respective key points in your report.

Maximum length of reports of systematic reviews is 3500 words. Please provide a structured abstract (max. 250 words). Authors are encouraged to publish additional material (for instance, large tables, figures with forest plots, data from subgroup analyses etc.) as Supplemental Digital Content (see above for details).

Conventional (non-systematic) Narrative Reviews

There are three sources of narrative reviews – commissioned, non-commissioned or invited, for instance, on the basis of a Refresher Course lecture presented at the annual Euroanaesthesia meeting.

We welcome the submission of review articles and prospective authors are invited to contact the Editor-in-Chief to discuss their proposed topic. However, all review articles undergo peer review after submission and final acceptance is not guaranteed.

Narrative reviews should start by posing a clear question they aim to answer or with a clear description of the intended educational aim. While such reviews do not include a systematic search, they should be compiled after a careful search of the available, recent literature taking care to avoid any personal bias. They should be based on the synthesis of statements that summarise the literature using appropriate references. Summary tables may be included and figures copied (with permission) from important papers in the field may help readers understand the subject matter.

The manuscript should have a maximum length of 3500 words. Please include a title page (see paragraph: Title Page) and an acknowledgement statement (see paragraph: Acknowledgement). Please provide an unstructured abstract (maximum 350 words) which should summarise the most important conclusions.

Practice Guidelines

In general, published statements intended to guide clinical care (e.g., Guidelines, Practice Parameters, Recommendations, Consensus Statements, Position Papers) should describe:

1. The clinical problem to be addressed;
2. The mechanism by which the statement was generated;
3. A review of the evidence for the statement (if available), and;
4. The statement on practice itself.

As more than one group or society may issue statements on the same topic, this often results in confusion amongst clinicians. To minimize confusion and to enhance transparency, such statements should begin with the following bulleted phrases, followed by brief comments addressing each phrase:

- What other guideline statements are available on this topic?
- Why was this guideline developed?
- How does this statement differ from existing guidelines?
- Why does this statement differ from existing guidelines?

Editorials

Editorials discuss issues that are not directly related to published material. Editorials are usually commissioned. Editorials should be up to 1500 words long with no more than 15 references. Please include a title page giving all authors' names, addresses, email addresses, phone and fax numbers, as well as an Acknowledgement statement (see paragraph: Acknowledgements) and signed copyright forms. Editorials do not have an abstract.

Commentaries

Commentaries discuss issues that are directly related to published material. Commentaries accompany original articles, critically appraise their results and put their conclusions into a wider context. Commentaries are always commissioned and should be up to 1000 words long with no more than 10 references. Commentaries do not have an abstract. Please include a title page giving the author's name, address, email address, phone and fax numbers, as well as an Acknowledgement statement (see paragraph: Acknowledgements) and signed copyright forms.

Correspondence

In this section, we publish case reports, letters and replies. Items in the Correspondence section are peer reviewed. Please look at a very recent copy of the European Journal of Anaesthesiology to see how the material should be presented. The format (layout) for the Correspondence section is quite different

from our other articles. The absolute maximum is 1000 words, which must include the space for any tables and illustrations (this is approximately two sides of printed matter in the Journal). References are limited to seven. For case reports please send copies of patient consent forms which clearly grant permission for the publication of photographs or other material that might identify the patient. A statement to the effect that such consent had been obtained must be included in your paper.

The standard covering letter should be submitted with the correspondence. Correspondence articles do not have an abstract. Please include a title page giving the author's name, address, email address, phone and fax numbers, as well as an Acknowledgement statement (see paragraph: Acknowledgements) and signed copyright forms.

English language editing

If you are inexperienced in publishing medical articles in English then it may be helpful to have your manuscript reviewed by a professional editor so that you submit it in grammatically and syntactically acceptable English. The list below is provided for the benefit of authors seeking assistance in writing and editing their manuscripts. The *EJA* does not endorse any writing/editing services.

Apêndice

COMPARAÇÃO DO DANO LARINGOFARÍNGEO TUBO OROTRAQUEAL VS MÁSCARA LARÍNGEA

M.Barros[1], J. Mourão[2].

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2.Assistente Hospitalar. Serviço de Anestesiologia, Centro Hospitalar S. João.; Faculdade de Medicina da Universidade do Porto.

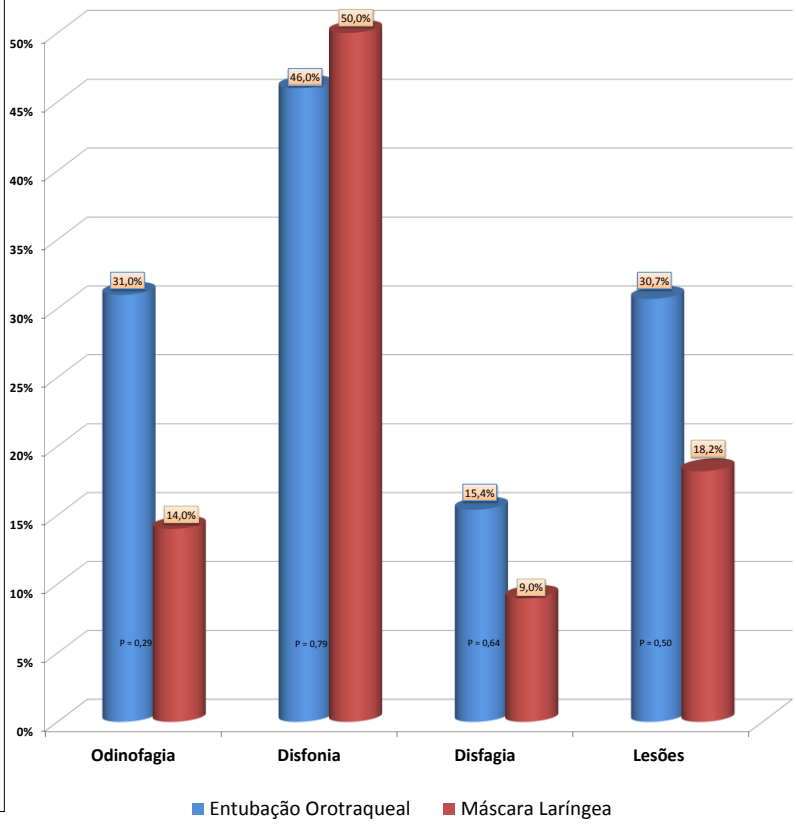
INTRODUÇÃO E OBJECTIVOS:

A Máscara Laríngea (ML) constituí uma alternativa de manuseamento da via aérea relativamente à Entubação Orotraqueal (ET) para procedimentos anestésicos. Complicações como odinofagia, disfonia e disfagia são sintomas frequentes após ET e a colocação da ML.[1]Este estudo pretende comparar a incidência e a gravidade do dano laringofaringeo após a utilização da ET e ML.

MATERIAL E MÉTODOS:

- Estudo prospectivo não randomizado
- 48 doentes entre os 19 e 85 anos, ASA I – III;
  26 submetidos a ET (54%) e 22 a ML (46%).
- Cirurgia electiva sob anestesia geral – Cirurgia geral, vascular, ortopédica e ginecológica.
- A escolha do acesso à via aérea assim como o procedimento anestésico usados ficaram à responsabilidade do anestesiologista (cego para o estudo).
- Critérios de Exclusão:
  - Doentes < 18 anos;
  - Queixas prévias de odinofagia, disfagia e disfonia;
  - Cirurgia da cabeça e pescoço;
  - Procedimentos de urgência.
- Os dados foram colhidos pela mesma pessoa usando um questionário de perguntas directas, 4 a 24 horas após o procedimento anestésico.

Comparação do Dano Laringofaríngeo
Entubação Orotraqueal vs Máscara Laríngea



DISCUSSÃO E CONCLUSÃO

A ET parece estar mais relacionada com dano laringofaringeo no que se refere à odinofagia, à disfagia e ao maior número de lesões dos tecidos moles comparativamente à utilização da ML. No nosso estudo encontramos uma associação entre disfonia e uso de ML superior à encontrada na literatura (2,3), assim como um caso de disfonia severa após a utilização da mesma técnica.

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(1) El-Seify ZA, Khattab AM, Shaaban A, Radojevic D, Jankovic I. Low flow anesthesia: Efficacy and outcome of laryngeal mask airway versus pressure-optimized cuffed-endotracheal tube. Saudi journal of anaesthesia. 2010;4(1):6-10.
(2) Rieger A, Brunne B, Hass I, Brummer G, Spies C, Striebel HW, et al. Laryngo-pharyngeal complaints following laryngeal mask airway and endotracheal intubation. Journal of clinical anesthesia. 1997;9(1):42-7.
(3) Figueredo E, Vivar-Diago M, Munoz-Blanco F. Laryngo-pharyngeal complaints after use of the laryngeal mask airway. Canadian journal of anaesthesia = Journal canadien d'anesthesie. 1999;46(3):220-5.

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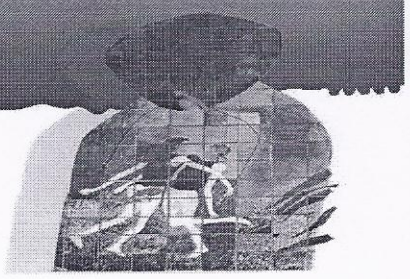

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Marta Barros

Apresentou o Poster nº **90** intitulado

" COMPARAÇÃO DO DANO LARINGOFARÍNGEO ENTRE A INSERÇÃO DA MÁSCARA LARÍNGEA E ENTUBAÇÃO OROTRAQUEAL"

Co-autores: Joana Mourão (Centro Hospitalar São João, EPE)

Congresso da Sociedade Portuguesa de Anestesiologia

O Presidente do Congresso

Lucindo Ormonde

Lucindo Ormonde