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Tracheal intubation in a simulated cervical spine immobilisation: the Macintosh laryngoscope versus supraglottic airway devices - a manikin study

Dawid Aleksandrowicz, Tomasz Gaszyński



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1 **Tracheal** intubation in a simulated cervical spine immobilisation:  
2 the Macintosh laryngoscope versus supraglottic airway devices - a manikin  
3 study

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5 Dawid Aleksandrowicz<sup>1</sup>, Tomasz Gaszyński<sup>2</sup>

6 <sup>1</sup> Guy's and St. Thomas' NHS Foundation Trust, St. Thomas' Hospital, London, United  
7 Kingdom

8  
9 <sup>2</sup> Department of Anaesthesiology and Intensive Therapy, Medical University of Łódź, Poland

10  
11 Dawid Aleksandrowicz

12 Department of Anaesthetics

13 Guy's and St. Thomas' NHS Foundation Trust, St. Thomas' Hospital

14 Westminster Bridge Road, London SE1 7EH, United Kingdom

15 Tel. 0044 (0) 207 188 0652

16 Fax 0044 (0) 207 188 0628

17 E-mail: radiowa10@poczta.fm

18  
19 **Abstract**

20 **Background.** Airway management is performed with simultaneous cervical spine  
21 immobilisation in trauma patients and is regarded as the gold standard. Application of spinal  
22 stabilisation may significantly worsen direct laryngoscopy and make intubation more  
23 difficult. Supraglottic airway devices may also be used for intubation. The aim of this study  
24 was to evaluate the Macintosh laryngoscope, the Classic Laryngeal Mask Airway and the I-  
25 gel used for **blind** intubation by experienced paramedics. **Cervical collar was used to simulate**  
26 **reduced cervical spine mobility.**

27 **Materials and methods.** Fifty-five experienced and active paramedics participated in the  
28 study (F=25, M=30). The intubation-to-successful-ventilation time was recorded. Efficacy of  
29 intubation and the ease of use by the operator were also assessed. All devices under study  
30 were used by each participant and they were randomly chosen. All participants were trained  
31 in supraglottic airway devices insertion and intubation although they were not experts in the  
32 latter as each of the paramedics performed less than 20 intubations.

33 **Results.** The mean intubation-to-ventilation time was the shortest when the I-gel device was  
34 used 28.2 s ( $\pm 2.09$ ). This was statistically significant when compared to both the Classic  
35 Laryngeal Mask Airway ( $p=0.0344$ ) and the Macintosh laryngoscope ( $p<0.0001$ ). Both of the  
36 studied supraglottic airway devices achieved an overall 100% successful intubation rate and  
37 required maximum 2 attempts out of 3 allowed.

38 **Conclusion.** The I-gel and the Classic Laryngeal Mask Airway were superior to the  
39 Macintosh laryngoscope as they shortened the time required to intubate and successfully  
40 ventilate the patient. They also improved the rate of successful intubation.

41  
42 *Key words: supraglottic airway device, intubation, manikin study, cervical spine*  
43 *immobilisation, Macintosh laryngoscope*

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