Secondary intubation through the Tulip® airway vs. Igel®

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Introduction;

The tulip airway is a second generation supra-glottic airway device which has been shown to be an effective means of ventilation both in manikin and clinical studies[12]. The management of the emergency difficult airway may be enhanced with the use of a Tulip airway. It can be inserted where limited mouth opening may be a consideration as well as representing a possible adjunct to aid intubation in a compromised airway and as part of a failed intubation strategy. Current difficult airway society guidelines suggest a secondary tracheal intubation plan with the use of a fibreoptic scope[3] Revised draft guidelines suggest insertion of a supraglottic device for failed tracheal intubation with subsequent consideration for intubation through the supraglottic device[4]. The tulip airway may also be considered as a possible aid as part of a difficult extubation strategy. The study aimed to evaluate the ease of secondary fibreoptic intubation via the tulip gt.

Protocol;

Participants were asked to insert a size 4 tulip gt into the mouth of a mannequin until a natural resistance was felt. The cuff was subsequently inflated to the approximate volume as indicated on the tulip device. Effective ventilation was determined by successful inflation of mannequin lung. Similarly a size 4 Igel® was inserted into the mannequin until a natural resistance was felt and successful ventilation judged in the same way.

A 6.0 flexible-metallic endotracheal tube pre-loaded on an ambuscope®. Participants were allowed to ask for assistance in holding the scope or or have the endotracheal tube guided off the scope. Successful endotracheal intubation was confirmed by visualisation with ambuscope and checking for successful mannequin lung inflation after ETT cuff had been inflated and tulip cuff deflated. Speciality, grade, previous experience of fibreoptic intubation, ease of intubation on a 0 to 10 continuous line scale to were recorded. (0 = difficult, 10 = easy).

Participants were timed from the point of scope insertion into supraglottic device to the point at which first effective ventilation took place. Participants were randomised to using Tulip or Igel® first to negate and learning bias.

Results;

0 = Difficult, 10 = Easy

Speciality	Grade	Number of previous intubations	Tulip Ease	Tulip Time(s)	Igel Ease	Igel Time(s)
Anaesthetics	St6	15	10	17	7.5	24
Anaesthetics	Consultant	50	8.1	47	5.7	89
Anaesthetics	consultant	<10	7.2	50	4.8	97
Anaesthetics	ST3	4	6.4	65	5.4	37
Anaesthetics	PA	10	8	47	7	47
Anaesthetics	Consultant	30+	8	26	8	240
Anaesthetics	CT1	0	9	37	4	58
Anaesthetics	PA		6	20	5	20
Anaesthetics	Consultant	Many	10	27	7	71
Anaesthetics	Consultant	4	7	39	7	43
Anaesthetics	Consultant		8.4	10	8.1	14
Anaesthetics	FY1	0	9	7	4.7	59
Anaesthetics	ST4	3	10	24	3	50
Anaesthetics	CT2	0	9	37	6	80
Anaesthetics	ST6	5-10	7.4	20	7.4	32
Anaesthetics	Cons	10	7.9	10	5.3	20
Anaesthetics	CT2	0	9	14	6	23
Anaesthetics	CT1	0	8.6	40	7.6	90
Anaesthetics	ODP	7	10	23	3.3	57
Anaesthetics	cons	>100	8.8	26	3.8	44
Anaesthetics	ST6	1	9.8	35	6.7	52
Anaesthetics	Cons	25	9	30	7	62
Anaesthetics	Cons	100	8.5	42	4.7	79
Anaesthetics	Cons	?	9	47	7	6
Anaesthetics	Cons	lots	8.8	12	5.6	17
Anaesthetics	Cons	>50	8	16	9	11
Anaesthetics	Cons		10	35	5	65
Anaesthetics	ST7	15	9	11	8	12
Anaesthetics			7.6	29	5.2	32
	Mean average		8.534482759	29.06896552	6.027586207	52.79310345
	SD		1.081426261	14.5182915	1.550782418	44.46296959

Discussion;

The Tulip® airway represents an easy to use adjunct to secondary intubation. This study demonstrates a difference in terms of time of scope insertion to time of effective ventilation for Tulip® vs. Igel of 29.1 vs. 52.8 seconds respectively.

The Tulip® airway appeared to have a greater ease of insertion, with the Tulip® vs. Igel score being 8.5/10 vs. 6.0/10 respectively.

Although speed may not be the main aim of a secondary intubation attempt, the combination of favorable ease and speed of insertion in this mannequin study appear to suggest that the Tulip® airway would be the supra-glottic device of preference.

Future directions may compare the Tulip® airway against other adjuncts to oral fibreoptic intubation such as the Burman airway. The advantage of the Tulip® airway as an adjunct for secondary tracheal intubation are that it may be used as a supraglottic airway to maintain oxygenation and ventilation.

Importantly, the Tulip® airway allows secondary intubation without use of an airway exchange catheter.