

Patient Story – Foreign Body Airway Obstruction

Dr Tim Edwards
Consultant Paramedic

Advanced Airway Management in LAS



Background



London Ambulance Service **NHS**
NHS Trust

Complications associated with supraglottic airway use in an urban ambulance service: A case series

Tim Edwards (Consultant Paramedic, London Ambulance Service NHS Trust)



Introduction

Current resuscitation guidelines deemphasise the role of endotracheal intubation (ETI) in cardiac arrest in favour of supraglottic airway (SGA) devices. The optimal method of advanced airway management in out-of-hospital cardiac arrest remains equivocal, with some studies reporting improved outcomes associated with ETI and others reporting decreased odds of survival when comparing ETI with airway management via SGA. Some authors suggest that use of SGA devices by paramedics will result in less complications and higher procedural success rates when compared with ETI. However, results from some audits suggest that SGA procedural success rates are not always as high as envisaged. To date, no studies have specifically investigated adverse events associated with the introduction of SGA devices within an ambulance service.

Method

Cases reported to an ambulance service medical directorate involving adverse events associated with SGA use in cardiac arrest were logged from April 2014 – October 2015. Prehospital clinical notes were reviewed to determine patient demographics, details of adverse events, clinical course and patient disposition.

Results

A total of 6 cases with adverse events following SGA insertion in cardiac arrest were reported (table 1). All patients were male and aged between 35-83 years. The majority of cases (n=4) were associated with a history of choking and the SGA device was removed to facilitate ETI due to poor ventilation. In all these cases, laryngoscopy revealed the presence of food obscuring the glottis which was removed under direct vision. None of these patients presented in a shockable rhythm and 3 experienced sustained return of spontaneous circulation (ROSC). In another case, insertion of the SGA resulted in presumed traumatic avulsion of teeth necessitating direct removal under laryngoscopy. This patient presented in ventricular fibrillation following chest pain and achieved ROSC at the scene. The final case involved a 35 years male with an extensive history of deliberate self-harm who received ventilation via SGA throughout the resuscitation attempt. A plastic bag was found compacted into the airway at post mortem.

Limitations

These data are derived exclusively from cases notified to the ambulance service medical directorate, and may therefore under represent adverse events associated with SGA use in this setting.

Contact Information

Clinical & Quality Directorate, London Ambulance Service NHS Trust
Email: tim.edwards@londonambulance.nhs.uk

Table 1

Case	Clinical Details	EtCO ₂	Outcome
1	35 years male cardiac arrest—asytolic. Extensive psychiatric history. Air leak noted from SGA. Plastic bag found in airway at post mortem.	7.6 kPa	PLE @ ED
2	55 years male witnessed to choke whilst eating. Cardiac arrest—pulseless electrical activity. Airway reported clear during laryngoscopy. Poor chest rise with SGA. Food removed from airway when APP intubated.	8.5 kPa	ROSC to ED
3	52 years male witnessed V/F arrest. SGA inserted. Avulsed teeth noted when APP subsequently intubated—presumed trauma from SGA.	4.7 kPa	ROSC to ED
4	45 years male sudden collapse whilst eating. Cardiac arrest—asytolic. SGA placed. Food removed from airway when APP intubated.	1.2 kPa	ROSC to ED
6	74 years male collapsed whilst eating. Cardiac arrest—asytolic. SGA inserted, poor ventilation noted. APP removed food obscuring the glottis before intubation.	2.7 kPa	PLE
8	83 years male witnessed to choke whilst eating. Cardiac arrest. Food removed from airway before SGA insertion. Post ROSC laryngoscopy revealed food directly obscuring glottis.	11.2 kPa	ROSC to ED

ROSC—Return of spontaneous circulation. E.D.—emergency department. PLE—Prolonged life without

Conclusion

The majority of adverse events associated with SGA use in cardiac arrest in this case series related to airway obstruction following choking. EtCO₂ values were obtained despite these complications. ROSC in a number of these patients suggests this may have been a reversible cause of cardiac arrest. Future guidelines should emphasise the need for laryngoscopy to exclude foreign body airway obstruction prior to SGA insertion in appropriate cases.

References

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- From 2010 intubation training no longer routine for all paramedics
- Increasing use of supraglottic devices (i-Gel)
- Less instrumentation of airway with laryngoscope
- Case reports of missed foreign body airway obstruction
- Action required following coroner's inquest
- Presented at 2016 EMS research forum

Modifications to practice



Foreign Body Airway Obstruction – Clarification of Changes to Airway Management Procedures

1. A review of a number of serious clinical incidents and near-misses has shown that blind insertion of a supraglottic device in an emergency situation can result in displacement and / or impaction of an un-recognised foreign body in the upper airway. In some cases there was little or no information in the history that foreign body airway obstruction (FBAO) was a possibility. The following guidance is designed to promote safe and effective airway management. All staff **MUST** undertake a visual inspection of the mouth as part of the initial assessment of the airway of any collapsed patient, including patients whose collapse is witnessed. Staff should be alert to the possibility of FBAO where the history and / or circumstances are suggestive of this (for example sudden collapse whilst eating).
2. Where a supraglottic device (i-gel®) is chosen as an advanced airway in both adults and children, the clinician **MUST** inspect the hypopharynx (by inserting the laryngoscope all the way into the airway to the vallecular space) with a laryngoscope before placing the device, to ensure, to the best of their ability, that there is no obstruction. Training for this was provided as part of CSR 2016-1 and all staff who are authorised to use a supraglottic device must have completed this element of the course. Training for new staff will continue to emphasise the need to exclude foreign body airway obstruction prior to insertion of a supraglottic device.
3. Use of a laryngoscope to facilitate identification and management of FBAO differs from laryngoscopy to facilitate tracheal intubation. It is not mandatory to visualise the glottis and staff should not prolong inspection of the airway for this purpose prior to insertion of a supraglottic device.
4. Single-patient use laryngoscopes are to be kept in primary response and advanced life support bags for this purpose. They should remain sealed until use.

- Inspection of airway with laryngoscope prior to insertion of supraglottic airway (i-Gel)
- Laryngoscope added to primary response bag for immediate availability
- Some national discussion due to use of supraglottic devices by non-clinical responders (e.g. fire service, police etc)
- Engagement with national team and implementation of training.

The patient story



- 07:32 999 call received for 69 years female cardiac arrest
- 07:33 multiple resources dispatched
- 07:34 pre-arrival resuscitation instructions commenced
- 07:35 Advanced Paramedic listening to call identifies possible airway obstruction and advises paramedic fast responder

On arrival



- 07:38 first paramedic at scene
- 07:39 airway inspected – lump of food removed from airway
- 07:40 ambulance arrives
- 07:41 i-Gel inserted
- 07:43 IV line and 1mg adrenaline
- 07:45 pulse restored with some respiratory effort
- 07:55 Advanced Paramedic arrives and provides sedation prior to hospital transfer

Summary – research to resuscitation

- Value of research and audit in improving patient care
- Importance of ongoing professional development for all staff
- Central role of Emergency Operations Centre (control room)
- Doing the right thing for patients despite national debate
- Seeing the benefits in practice and reduction in incidents