

Avoiding Oesophageal Intubation - "Gold is good"

A previously well 13 year old girl was brought to the ED of a rural facility following an unwitnessed fall. She had a seizure lasting between 5-8 minutes which resolved following a dose of Midazolam on scene.

On arrival to the ED she was no longer fitting but had a Glasgow Coma Score (GCS) of 10 and was difficult to rouse. During assessment she started to vomit and staff were concerned she was unable to maintain her airway due to her decreased Level of Consciousness (LOC).

Her observations were between the flags but she soon commenced fitting again and was given another dose of Midazolam.

At this stage the patient was loaded with phenytoin and a decision was made to intubate given her ongoing GCS of 8 and need for imaging and potential specialty paediatric care at a tertiary facility.

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The team prepared for intubation, designating roles, checking drugs and preparing equipment. The ventilator was prepared and the end tidal CO₂ monitor was "warmed up". Monitoring was all re in place and observations remained "between the flags".

Intubation was uncomplicated, the Endo Tracheal Tube (ETT) was reported to pass through the vocal chords with subsequent rise and fall of her chest. She was transferred on to the ventilator without end tidal CO₂ monitoring attached.

Following this transfer the patients SpO₂ were noted to be in the low 80's and dropping. Staff began to ventilate using a bag attached to the ETT.

Despite good air entry reported at both axilla, the patient's SpO₂ did not improve and she developed Pulseless Electrical Activity (PEA).

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CPR commenced promptly and following multiple rounds of CPR the ETT was removed and the patient was re intubated. Return of spontaneous circulation occurred more than 20 minutes after the first attempt at intubation.

Observations remained stable (SpO₂ 90%, HR 152, 86/48) and NETS transferred the patient to the tertiary facility where an MRI later confirmed hypoxic brain injury.

Lessons learnt:

Although exactly what happened in this case is unknown, it is likely there was a period of oesophageal intubation which was not recognised because end tidal CO₂ monitoring was not used. Unrecognised oesophageal intubation is the most serious complication of attempted tracheal intubation.

No single method of confirmation of correct placement is 100% reliable

however methods that combine observations, measurement and imaging are best.

Measurement of the partial pressure of carbon dioxide at the end of exhalation (End tidal CO₂) is part of many best practice guidelines and standards in Australia. The Australian Resuscitation Council includes End-tidal carbon dioxide detector or capnography to confirm intubation as minimum standards.

Devices including the Easy Cap TM detects breath to breath colour changes through a pH detector purple filter paper which changes to yellow or gold in the presence of CO₂.

Capnography or ETCO₂ provides a display of the quantity of exhaled CO₂ over time which produces a characteristic waveform.

In the absence of capnography a disposable CO₂ detection device must be used for any intubation attempt in the early identification of oesophageal intubation.

Colour change to gold is one indication of a properly placed tube and should not be missed.



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