LARYNGOSPASM

MODULE: CRITICAL INCIDENTS

TARGET: ALL ANAESTHETISTS & INTENSIVISTS

BACKGROUND:

Laryngospasm is a common complication around the time of airway handling in adults and in paediatric patients. Junior trainees should have an approach to managing this crisis, and it’s potential complications. A protocol for managing this process has been published as an appendix to the Difficult Airway Society Extubation Guidelines, along with the further potential consequence of laryngospasm: negative pressure pulmonary oedema.

RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM

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| IG_BS_10 | In respect of airway management:  
- Demonstrates optimal patient position for airway management.  
- Manages airway with mask and oral/nasopharyngeal airways  
- Demonstrates hand ventilation with bag and mask  
- Able to insert and confirm placement of a Laryngeal Mask Airway  
- Demonstrates correct head positioning, direct laryngoscopy and successful nasal/oral intubation techniques.  
- Confirms correct tracheal tube placement  
- Demonstrates correct use of bougies  
- Demonstrates correct securing and protection of LMAs/tracheal tubes during movement, positioning and transfer.  
- Correctly conducts RSI sequence  
- Correctly demonstrates the technique of cricoid pressure |
| IG_BS_11 | Demonstrates correct use of oropharyngeal, laryngeal and tracheal suctioning |
| IO_BS_07 | Demonstrates role as team player and when appropriate, leader in the intra-operative environment |
| IO_BS_08 | Communicates with the theatre team in a clear unambiguous style |
| IO_BS_09 | Able to respond in a timely and appropriate manner to events that may affect the safety of patients [e.g. Hypotension, Massive haemorrhage] [S] |
| CI_BK_02 | Unexpected fall in SpO2 with or without cyanosis |
| CI_BK_03 | Unexpected increase in peak airway pressure |
| CI_BK_13 | Difficult/failed mask ventilation |
| CI_BK_17 | Laryngospasm |
| CI_BK_19 | Bronchospasm |
| CI_BS_01 | Demonstrates good non-technical skills such as: [effective communication, team-working, leadership, decision-making and maintenance of high situation awareness] |
| CI_BS_02 | Demonstrates the ability to recognise early a deteriorating situation by careful monitoring |
| CI_BS_03 | Demonstrates the ability to respond appropriately to each incident listed above |
| CI_BS_04 | Shows how to initiate management of each incident listed above |
| CI_BS_05 | Demonstrates ability to recognise when a crisis is occurring |
| CI_BS_06 | Demonstrates how to obtain the attention of others and obtain appropriate help when a crisis is occurring |
| CI_IS_01 | Demonstrates leadership in resuscitation/simulation when practicing response protocols. |
| CI_IS_02 | Demonstrates appropriate use of team resources when practicing response protocols. |
INFORMATION FOR FACULTY

LEARNING OBJECTIVES:

- Consideration of appropriate options for the common complication of airway management
- Demonstration of recognition and a logical, structured approach to managing laryngospasm.
- An approach to managing the post-laryngospasm complication of post-obstructive pulmonary oedema.

SCENE INFORMATION:

- Location: Theatre

This scenario takes place at the end of an operation that required intubation e.g., laparoscopic cholecystectomy. Following extubation in theatre, the patient develops laryngospasm signified by a ‘crowing’ stridor and a rapid desaturation. Mask ventilation is unsuccessful and the participant needs to adopt strategies to break the laryngospasm. Following management of the laryngospasm, the patient develops negative pressure pulmonary oedema requiring further management.

EQUIPMENT & CONSUMABLES

| Manikin – on theatre trolley. ETT in situ – IPPV. | Anaesthetic junior trainee |
| Checked anaesthetic machine | Anaesthetic Assistant |
| Stocked Airway trolley | Anaesthetic Senior Trainee |
| - Laryngoscopes (2 x Macintosh) | Surgeon (optional) |
| - ET Tubes (Various Sizes) | Scrub nurse (optional) |
| - OP, NP and Advanced Supraglottic airways (iGels, LMAs) | |
| Working suction | |
| Theatre drapes (partially obscuring head and airway of mannequin) | |

PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

You are the anaesthetist for an elective Laparoscopic Cholecystectomy. Your patient is Jennifer Roberts, a woman in her 40’s. She has a background of Cholecystitis, Gallstones and occasional heart burn. Her BMI is 36. She is allergic to Penicillin. She last ate at 2200 yesterday. Please proceed as appropriate,

‘VOICE OF MANIKIN’ BRIEFING:

Silent whilst intubated. After extubation, a regular ‘crowing’ noise from the upper airway develops.

VOICE OF ‘TELEPHONE HELP BRIEFING’

Help will arrive as soon as possible.
CONDUCT OF SCENARIO

INITIAL SETTINGS
A: Intubated. Drapes partially covering face and airway
B: IPPV. FIO2 40%, Vt 500mls, SaO2 98%. RR 14.
C: HR 70. BP 105/60.
D: Eyes closed and taped. GCS 3/15.

EXPECTED ACTIONS
• Prepare for end of anaesthetic
• Suction
• Turn off Vapour
• FIO2 100%

EXTUBATION
B: SpO2 fall to 70% over 2 minutes. Can’t intubate, can’t ventilate settings.
C: HR increases to 130 over 3 mins, BP 90/55.
D: GCS remains 3/15.

EXPECTED ACTIONS
• Recognise crisis occurring
• Attempt mask ventilation with CPAP.
• Suction under direct vision
• Consider dose of Propofol and/or Suxamethonium
• Call for help
• Consider options: Re-anaesthetise and/or re-paralyse
• Appropriate choice of airway management either LMA insertion or re-intubation

LOW DIFFICULTY
• SaO2 recovers fully with appropriate airway management

NORMAL DIFFICULTY
• Despite LMA/ETT insertion and adequate ventilation, SaO2 slow to recover – pulmonary oedema: Bilateral crackles and SaO2 85%

EXPECTED ACTIONS
• Recognise further crisis occurring
• Reassessment + consider differentials
• Appropriate Rx for pulmonary oedema
• Planning for further post-op care

HIGH DIFFICULTY
• Unable to ventilate or reintubate
• Sao2 fall to 50%
• Slow to recover due to pulmonary oedema

EXPECTED ACTIONS
• Progress along failed intubation protocol, incl. Plan D Surgical airway
• Recognition & Mx Pulmonary oedema
• ICU handover

RESOLUTION
Scenario ends with adequate plan for further care
### Anaesthetic Record Sheet

**Patient Details**
- **Hospital No.**
- **Surname:** Jennifer Roberts
- **DOB:** 15/06/1968
- **Address:**
- **Ward/Hosp.**
- **Sex:** M / F
- **Sex:**
- **Procedure(s) proposed:** Laparoscopic Cholecystectomy
- **CEPOD Class:** Elective / Scheduled / Urgent / Emergency

### Anaesthetist's Preoperative Assessment by

**Name:**

**Grade:**

- Cons
- AS
- SG
- Trainee

**Date:**

**Time:**

**Signature:**

### Anaes / Surg history:
- No previous GAs

### Medical history:
- Recurrent Cholecystitis
- Gallstones
- Occasional Reflux
- Increased BMI (36)

### VTE Risk:
- High
- Low

### NBM since:
- Solids: 2200 yesterday
- Clear Fluids:
- Pregnancy:
- Lactation:

### Relevant Medication:

- **Haematology**
  - FBC
  - Hb 11.8

- **Biochemistry**
  - U & E
  - NAD

- **Coag**
  - NAD

- **ECG**
  - NAD

### Other:
- Abdo USS - Gallstones

### Investigations

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### Consent

- **GA**
- **Sedation**
- **Epidural**
- **Spinal**
- **Regional**
- **Suppository**
- **PCA**
- **EPCA**
- **Other**

### Notes / Discussion / Technique proposed:

- Consented for GA and local anaesthetic infiltration.
- Risks explained: dental damage, sore throat, post-op nausea and vomiting.

### Allergies

- **Penicillin**

### ASA

- **BP:**
- **HR:**
- **Temp:**
- **Weight:**
- **Height:**
- **BMI:**
- **Smoke:**
- **Alcohol:**
- **Apfel Score**

### Airway Assessment

- **Mouth Opening:** 3cm
- **Jaw:** MP 2, mouth opening
- **Neck:** 3cm, slightly limited neck
- **TEETH:**

### Apfel Score

- **X = missing**
- **L = loose**
- **B = bridge**
- **C = caps / crowns**
- **D = damaged**

### For attention of ward staff:

- For further investigations, fasting, continue/omit current medication, etc.

- An anaesthetic information leaflet received by patient.
DEBRIEFING POINTS FOR FURTHER DISCUSSION:

• Consideration of appropriate options for the common complication of airway management

• Demonstration of recognition and a logical, structured approach to managing laryngospasm.

• An approach to managing the post-laryngospasm complication of post-obstructive pulmonary oedema.

DEBRIEFING RESOURCES

- Appendix 1: Laryngospasm, and Appendix 2: Post-obstructive pulmonary oedema.
  Visvanathan T, Kluger MT, Webb RK, Westhorpe RN
  http://qualitysafety.bmj.com/content/14/3/e3.full
  Larson P
INFORMATION FOR PARTICIPANTS

KEY POINTS:
- Consideration of appropriate options for the common complication of airway management.
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WORKPLACE-BASED ASSESSMENTS

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Demonstrates the emergency management of the following specific conditions in simulation:

• Laryngospasm
• Bronchospasm

FURTHER RESOURCES


http://qualitysafety.bmj.com/content/14/3/e3.full

PARTICIPANT REFLECTION:

What have you learnt from this experience? (Please try to list 3 things)

How will your practice now change?

What other actions will you now take to meet any identified learning needs?
PARTICIPANT FEEDBACK

Date of training session: .................................................................................................................................

Profession and grade: ........................................................................................................................................

What role(s) did you play in the scenario? (Please tick)

- Primary/Initial Participant
- Secondary Participant (e.g. ‘Call for Help’ responder)
- Other health care professional (e.g. nurse/ODP)
- Other role (please specify):
- Observer

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<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<td>I found this scenario useful</td>
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<tr>
<td>I understand more about the scenario subject</td>
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<tr>
<td>I have more confidence to deal with this scenario</td>
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<td>The material covered was relevant to me</td>
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Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants?

(This is especially important if you have ticked anything in the disagree/strongly disagree box)
FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn’t it go well?

How could the scenario be improved for future participants?