

CASE- 6

Muscle Relaxants

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- *A 4- years old male patient booked for right eye squint surgery*

How you will assess this patient preoperatively ??



Previous Illnesses

Medication and Allergies

**Past Anaesthetic
History**

Weight and Age

*History and
examination*



**Family History
Malignant
Hyperthermia**



**Dentition Pre-existing
Damage, Risk of
Damage**

**Rapport should be
established with the
child and his/her
parent(s)**

Airway Assessment

Previous difficulties with airway management

Small mouth

surgery/Radiotherapy to head and neck

Cervical spine problems

Conditions affecting tongue size

Infection to the airway

Obesity- obstructive sleep apnoea (OSA)

Protruding/ 'buck' teet



- **URTI common in young children and place the child at increased risk of perioperative respiratory problems.**
- **Ideally, several weeks should have elapsed following a URTI. Child with a productive cough, chest signs or a temperature should not be submitted to elective surgery**

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Airway Assessment

Atlanto-occipital mobility

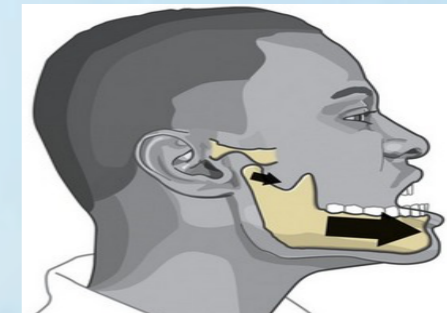


Thyromental distance >6 cm

Interincisor gap 4–6 cm

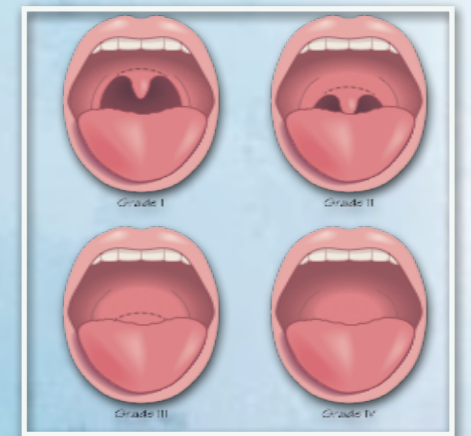


Mandibular protrusion



Sternomental distance >12.5 cm

Mallampati score



- **Preoperative tests :**

A. Common tests include full blood count, electrolytes and urea, coagulation screen, ECG and chest X ray.

B. For patients at risk and/or those undergoing **major surgery (particularly vascular surgery) further, more detailed tests might include:**

- liver function tests;
- arterial blood gas analysis;
- respiratory function tests;
- cardiac echocardiography and other imaging (including angiography) to assess left ventricular function, valve gradients and quantify ischaemic heart disease.

C. **cervical spine X ray may be required in those with suspected cervical spine degeneration, surgery and trauma as neck mobility is a key determinant of ease of tracheal intubation.**

Peroperative medication :

- * Generally, all medication is continued perioperatively except:
 - drugs that affect coagulation (warfarin, heparin, aspirin, clopidogrel);
 - hypoglycaemics;
 - some hypotensive drugs, e.g. ACE inhibitors are stopped only on the day of surgery.

Assessment of risk :

- * There are many general risk-scoring systems; the most well known is the American Society of Anesthesiologists (ASA) grading

ASA grade	Definition	Example
I	A normal healthy patient	
II	A patient with mild systemic disease	Well-controlled hypertension, asthma
III	A patient with severe systemic disease	Controlled CHF, stable angina
IV	A patient with severe systemic disease that is a constant threat to life	Unstable angina, symptomatic COPD, symptomatic CHF
V	A moribund patient who is not expected to survive without the operation	Multiorgan failure, sepsis syndrome with haemodynamic instability
VI	A declared brain-dead patient whose organs are being removed for donor purposes	

Emergencies are followed by the letter E.
CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease.

**Discuss Fasting
time and
premedication**



Fasting:

- To prevent aspiration elective surgery should not proceed unless the patient has had:

>2 hours since last clear fluid

>4 hours since milk

>6 hours since last solid food.

- **Premedication:**

The 6 As of premedication

Anxiolysis

➤ E.g. benzodiazepines

Amnesia

➤ E.g. lorazepam

Anti-emetic

➤ e.g. dopamine antagonists

Antacid

➤ E.g. Oral sodium citrate

Anti-autonomic

➤ Preoperative drying of secretions

Analgesic

- **The patient seen in preoperative anesthesia clinic and cleared for squint surgery under general anesthesia, Bwt: 16 kg**

What are the physiological difference between adult and pediatric patient



❖ Respiratory system :

- Higher $\dot{V}O_2$ per kg
- Higher RR; same V_T per kg
- Reduced lung compliance and increased airway resistance
- Neonates at risk of apnoea

❖ CVS :

- CO rate dependent
- BP lower

❖ Thermo regulation:

- High SA : Wt ratio leading to more rapid heat loss
- Poor thermo- regulatory control

❖ Others:

- Immature liver function
- Kidney unable to excrete Na Load
- Blood volume higher per kg
- Blood brain barrier more permeable

**Discuss anesthesia
consideration and special
concern for such this
surgery**



- **The airway:** is covered by drapes and needs to be secured by LMA or a tracheal tube is often preferred in younger children.
- **The oculocardiac reflex:** pressure/ tension on the globe or eye muscles can cause a marked bradycardia : pretreatment with atropine for prevention
- **Postoperative N/V :** pretreatment with antiemetic for prevention
- **Postoperative malignant hyperthermia :** suxamethonium is best avoided as this is a trigger for MH

What would be your choice of muscle relaxant for this surgery and why



administer atropine at induction is necessary if propofol, which has a bradycardic effect, is used for induction or maintenance of anaesthesia.

sevoflurane is more suitable as it is associated with less oculocardiac reflex (OCR).

If muscle relaxation is needed (rocuronium) appear to attenuate the oculocardiac reflex

Children with a positive oculocardiac reflex are much more likely to develop postoperative nausea and vomiting (PONV) reflex can be prevented by Blocking the afferent limb of the reflex using a peribulbar block by bupivacaine and lignocaine. (high risk percedure)

During surgery the patient developed sever bradycardia , discuss the cause and treatment



Differential Diagnosis

1. Hypoxia

It is almost always the cause of intra operative bradycardia. Children undergoing such anesthesia are known to have a greater likelihood of developing intraoperative hypoxemia which Lead to hypoxia in part due to reduced functional residual capacity and higher metabolic requirements compared to adult.

Note: Hypotension definitions in children aged 1-10 years: SBP < 70 +(age in years X 2)

Management:

- If Spo2<94% assume HYPOXIA until proven otherwise and must be treated immediately !**
- When hypoxia occurs, it is essential to decide whether the problem is with the patient or the equipment.**
 - 1-Administer 100% oxygen.**
 - 2-Ventilate by hand.**
 - 3-call for help and consider 'ABCDE'.**
 - 4-Check for likely causes in a logical sequence and Treat causes as you identify them.**
 - 5-After a quick check of the common patient problems, make sure the equipment is working.**

2. The oculocardiac reflex



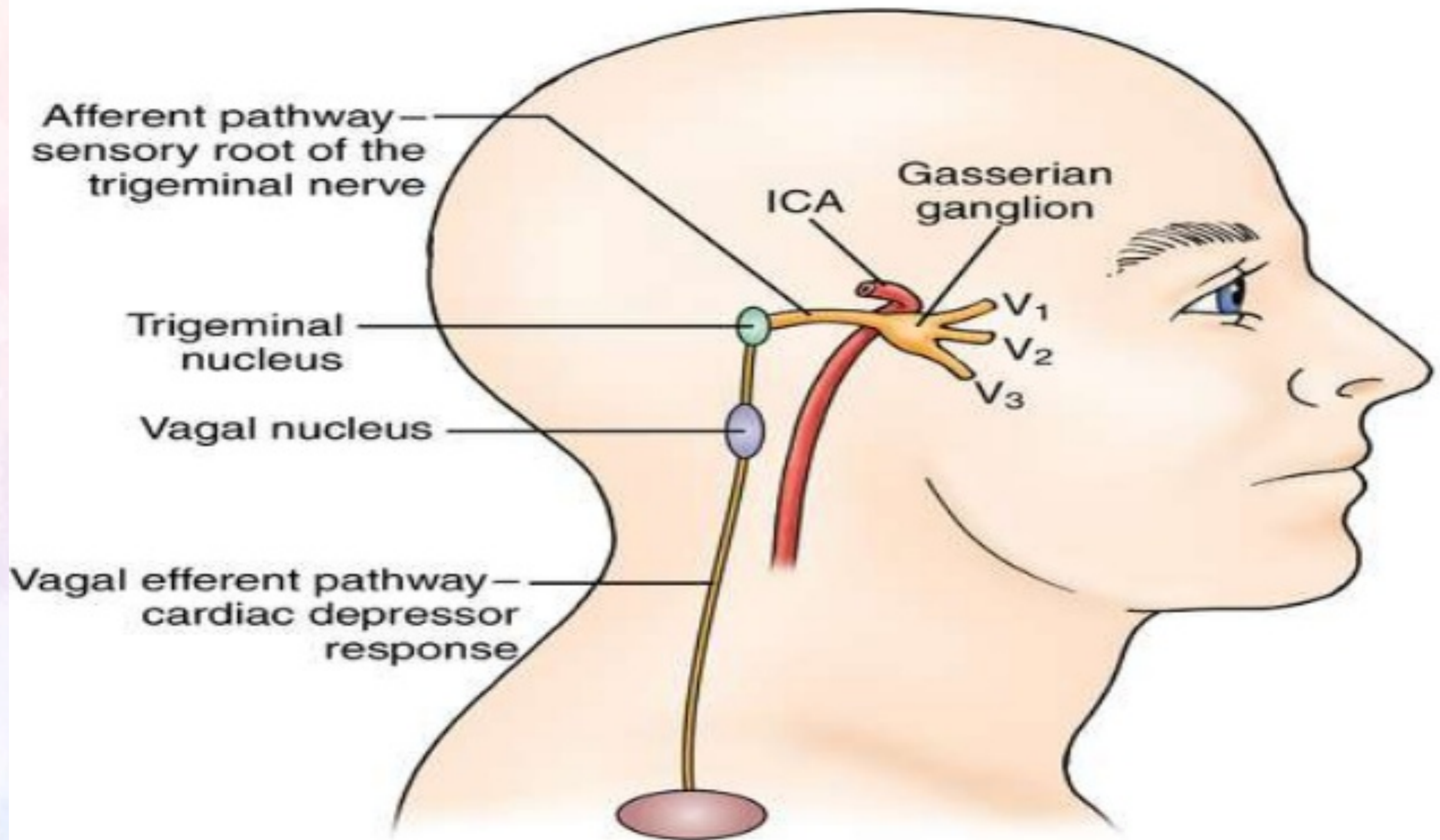
**It is a decrease in pulse rate (marked bradycardia) associated with traction applied to extraocular muscles and/or compression of the eyeball.
This reflex is especially sensitive in neonates and children In such surgeries,
However, it may also occur with adults.**



Management:

It can be avoided by pretreatment with an anti-muscarinic acetylcholine antagonist like atropine.

OCULOCARDIAC REFLEX



Management of bradycardia in general

Initial evaluation:

- Assess appropriateness for clinical condition
- Heart rate typically < 60 bpm if bradyarrhythmia

Initial intervention:

- Maintain patent airway
- Assist breathing as needed
 - Administer oxygen if hypoxemic
- Attach monitor/defibrillator
- Monitor blood pressure and oximetry
- Obtain intravenous (IV)/intraosseous (IO) access
- Perform 12-lead electrocardiography (ECG); do not delay therapy
- Check for signs of poor perfusion(Hypotension,Acutely altered mental status,Signs ofshock)
- Consider expert consultation

Management of persistent bradycardia:

- Administer epinephrine
- Consider atropine for increased vagal tone or primary atrioventricular block (AV) block
- Treat underlying causes

Thank You ...