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Marsupialization of a Ranula in a 9-Year-Old Patient with Cerebral Palsy with Spastic Quadriplegia: A Case Report

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Abstract

This case report presents the successful surgical marsupialization of a ranula in a 9-year-old female patient with cerebral palsy with spastic quadriplegia, with attention to the anesthetic management and considerations required for high-risk pediatric patients with cerebral palsy and spastic quadriplegia . The interdisciplinary collaboration between surgery, pediatrics and anesthesiology, along with tailored intraoperative precautions, contributed to a positive outcome.

Introduction

Ranulas are mucous retention cysts arising from the sublingual gland, often managed with surgical intervention, such as marsupialization. In pediatric patients, particularly those with cerebral palsy, anesthetic management requires tailored precautions due to the increased risk of respiratory complications, difficulties with airway management, and the potential for prolonged recovery. This report describes the management strategy for a patient with cerebral palsy undergoing general anesthesia for ranula marsupialization.

Case presentation

Patient information

This is the case of 9 years old female with known case of cerebral palsy with spastic quadriplegia with limited mobility and communication, no prior surgeries. The patient presented with painless swelling in the floor of her mouth, size of approximately 3*2 cm, diagnosed clinically and confirmed as a ranula. This swelling had led to difficulty in swallowing and episodes of apnea occasionally. With meticulous history and examination, decision surgical marsupialization under general anaesthesia was taken.

Preoperative evaluation

- **Pediatric consultation**: Conducted for surgical clearance with consideration of the cerebral palsy with spastic quadriplegia diagnosis, potential respiratory complications, and the need for PICU support if required postoperatively.
- **Preanesthetic clearance (PAC)**: Obtained with high-risk consent.

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Preoperative investigations

- Hemoglobin: 12.12 g/dL
- WBC Count: 9580/cmm
- Blood Group: O-positive
- Serology: Non-reactive
- Prothrombin Time (PT): 14 sec
- INR: 1.1
- Serum Creatinine: 0.6 mg/dL
- Electrolytes: Na+ 133 mEq/L, K+ 4.5 mEq/L
- Chest X- ray was grossly normal

Anesthetic management

Due to the high risk associated with cerebral palsy, the anesthetic plan prioritized airway security, avoidance of prolonged neuromuscular blockade, and hemodynamic stability. Due to spastic quadriplegia, patient positioning was another major challenge. The patient's family was counseled on the high risk associated with the surgical procedure and anesthetic drug administration, including the potential for prolonged mechanical ventilation and the need for postoperative ICU stay.

Conduct of anesthesia

1. **Premedication and Monitoring**: Standard intraoperative monitoring (ECG, pulse oximetry, capnography, and temperature) was applied.
2. **Pre-induction Medication**:

- Glycopyrrolate 0.1 mg IV for secretion control.

3. **Induction**:

- Fentanyl 15 mcg IV, Ketamine 10 mg IV, Propofol 50 mg IV, and Rocuronium 7 mg IV.

4. **Maintenance**: Total intravenous anesthesia (TIVA) using oxygen and infusion of propofol.
5. **Intraoperative Management**:

- Blood glucose monitoring: GRBS recorded at 197 mg/dL.

6. **Total fluid:** compound lactated ringer solution 350ml

- Medications administered included Paracetamol 300 mg IV for analgesia, Dexamethasone 2 mg IV for anti-inflammatory and antiemetic effect, and Ondansetron 2 mg IV for nausea prevention.

Precautions specific to cerebral palsy

- **Airway Management**: Readiness for potential difficult airway scenarios; adjuncts and fiberoptic bronchoscopy equipment were available.
- **Temperature Control**: Maintenance of normothermia due to the high sensitivity of cerebral palsy patients to hypothermia.
- **Neuromuscular Monitoring**: Minimal use of neuromuscular blockade to prevent prolonged recovery.
- **Positioning**: positioning was challenging due to spastic paraplegia. Padding and proper positioning to prevent injury, given limited mobility and spasticity associated with cerebral palsy.
- **Postoperative Respiratory Support**: Readiness for PICU admission if required for prolonged ventilation.

Intraoperative course

Airway of the patient was secured with 5.5 mm cuffed endotracheal tube. The surgery proceeded without complications, with stable hemodynamic parameters throughout. No significant respiratory events or desaturation episodes were noted postoperatively. The patient remained hemodynamically stable, and blood glucose levels were managed within the target range.

Postoperative management

The patient was closely monitored in the recovery room for signs of respiratory depression or prolonged recovery due to her cerebral palsy condition. Vitals remained stable, and the patient showed an uncomplicated recovery. The following postoperative orders were given:

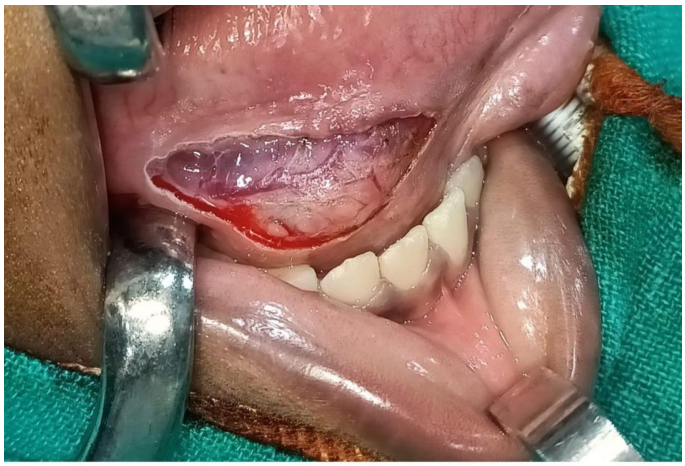
- **Analgesia**: Paracetamol for pain control.
- **Monitoring**: Regular neurovascular checks and respiratory function monitoring.
- **Discharge Plan**: The patient was discharged on the third postoperative day with instructions for oral hygiene and wound care.

Discussion

This case underscores the importance of an interdisciplinary approach in managing pediatric patients with cerebral palsy with spastic quadriplegia undergoing surgical procedure under general anesthesia. Specific anesthesia protocols aimed at minimizing respiratory and neuromuscular complications and maintaining hemodynamic stability were pivotal in ensuring a safe outcome. TIVA has been excellent choice of anaesthesia in such cases. Emergence from anaesthesia is also very rapid in TIVA with minimal postoperative respiratory compromise. Detailed preoperative planning, experienced anaesthesiologist, prudent surgical technique, parental counseling, and readiness for potential postoperative ventilation were critical.

Conclusion

Marsupialization of a ranula in pediatric patients with cerebral palsy can be performed safely with meticulous preoperative assessment, intraoperative precautions, and vigilant postoperative monitoring under the guidance of experienced anaesthesiologist. This case demonstrates successful management, emphasizing the significance of tailored anesthetic care in high-risk pediatric patients.

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