

Anaesthetic Management In A Case Of Ameloblastoma With Free Fibular Graft

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Citation

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Abstract

Ameloblastoma is a common neoplasm affecting the jaws. It is an aggressive benign tumor of epithelial origin. Ameloblastomas are recognized for their invasive growth and tendency to recur. Reconstruction procedures are usually prolonged and require meticulous attention to fluid replacement, blood loss, and prevention of hypothermia. Hence they present a challenge to the anaesthesiologist.

CASE REPORT

A 26 year old female weighing 36kgs presented with pain and swelling in the right jaw/mandible that had existed for two years. Her past medical and surgical history was unremarkable.

Upon airway examination, the mouth opening was adequate, Mallampati class 1. No restriction of head and neck movement was noted. The results of general and systemic examination were within normal limits. CT scan showed a large dentigerous cyst involving the right hemimandible. Biopsy report indicated this mass to be ameloblastoma of cystic variety.

The patient was fasted for 8 hrs preoperatively. Consent for anaesthesia and surgery were obtained. The patient was trolleyed into the operating room and monitors including cardioscope, pulse oximeter, NIBP, capnometer and temperature probe were attached.

A large bore i.v. access was secured on left upper limb. The patient was premedicated with inj. midazolam 0.03mg/kg i.v. and inj. buprenorphine 3 µg/kg i.v. Anaesthesia was induced with inj. propofol 2mg/kg i.v. and inj. pancuronium 0.1mg/kg i.v. The trachea was intubated with a no. 6.5 cuffed preformed polar RAE tube passed through the nasotrachea using a blind nasal technique. Correct placement of the tube was confirmed by chest auscultation and capnography. The tracheal tube was secured to the nose with a linen stitch and proper position of the neck gave almost full extension after cleaning and draping for adequate exposure to the tumor (figure 1). Lungs were ventilated with

O₂: N₂O(50:50) and halothane using a closed circuit. Throat packing was performed using magill's forceps and ryle's tube no.14 was inserted through the other nostril. Inj. propofol infusion was started at 2mg/kg/hr i.v. to maintain depth of anaesthesia. Another large bore i.v. line was secured on the other hand.

Figure 1

Figure 1: position of the patient's neck for proper dissection of the tumor mass



Exposed parts of the body were covered with polyethylene surgical drape and warm gangees to prevent hypothermia. The patient was infused with crystalloids 6ml/kg/hr and 6% hydroxyethyl starch at 10ml/kg. Urine output was measured hourly and maintained at 0.5ml/kg/hr. Inj. buprenorphine was repeated after 8hrs (1.5µg/kg).

Figure 2

Figure 2: excised mandible showing tumor mass



The duration of anaesthesia was 12 hrs and average blood loss was 350ml. The excised tumor mass was around 8cm×4cm×3cm (figure 2). Tourniquet time was 1 hr 45 min. Ischemia time was 2 hrs 35 min. Dextran 40 was started at 0.5ml/kg/hr prior to commencing vessel anastomosis and was continued in the postoperative period. Inj. low molecular weight heparin was given s.c to maintain graft patency. Arterial blood gas initiated towards end of surgery.

Postoperatively, it was decided to extubate the trachea as there was minimal airway edema and the patient was fully awake. The throat pack was removed and trachea extubated after adequate reversal of neuromuscular blockade and thorough endotracheal and oral suctioning.

DISCUSSION

Ameloblastoma, previously called adamantinoma, is a benign, epithelial, locally-invasive, odontogenic tumour that grows slowly and persistently. The tumour is relatively uncommon, accounting for approximately 1% of all oral tumours ¹. It occurs in all age groups but the lesion is most commonly diagnosed in the third and fourth decades. It typically occurs in tooth-bearing areas of the jaws and appears on X-ray as a cystic lesion. The tumour shows a marked predilection for the mandible with a preponderance that could be as high as 99.1% ². Approximately 17% of the tumours reported are associated with an impacted tooth and a follicular (dentigerous) cyst ³. There is early spread to paranasal sinuses, the pterygomaxillary fissure, infratemporal fossa and nasal cavity.

Intracranial or orbital invasion may be associated with ameloblastoma. Reports from Nigeria found that the lesions

are frequently gigantic and often cause severe grotesque disfigurement ^{4,5}. Treatment options include both radical and conservative surgical excision, curettage, chemical and electrocautery, radiation therapy or a combination of surgery and radiation. The prognosis for patients afflicted with this form of neoplastic disease is favorable ⁶. Excision of the tumor leaves a defect in the mandible. Primary repair of mandibular defects is widely accepted ⁷. Pedicled as well as free osteocutaneous flaps have been used to reconstruct mandibular defects ⁸. In our case, a free fibular osteocutaneous graft was used.

Large ameloblastoma can distort the facial contour and make mask ventilation difficult. If the tumour occupies a large part of the oral cavity or severe trismus is present, it may be impossible to insert a laryngoscope or oropharyngeal airway. The intraoral extension can also cause airway obstruction and difficulty in visualizing the glottis. As the tumor size was small and there were no signs of airway obstruction, we induced the patient first with i.v. anaesthetic agents. Direct laryngoscopy could have caused trauma to the growth, resulting in bleeding and aspiration of blood and tumor mass into the airway. Therefore, we decided to use a blind nasal technique. A nasotracheal tube was preferred as it was an oral surgery.

Other intubation techniques in such patients include awake intubation, tracheostomy and transtracheal jet ventilation in emergency situations ⁹. The various methods of awake intubation include direct laryngoscopy, blind nasal, fiberoptic, and retrograde intubation after appropriate airway anaesthesia. Blind nasal intubation does not require any special equipment but requires skill and expertise. However, the risk of bleeding from nose and tumor exists. Retrograde intubation can be safely used to retrieve the catheter ¹⁰. It may be specially useful in patients with airway trauma or limited neck mobility and in the presence of oropharyngeal bleeding that may obscure the fiberscope field.

In massive ameloblastoma with extension into the oral cavity, awake fiberoptic intubation is the technique of choice because of several reasons. It is less stimulating than direct laryngoscopy, helps to assess the airway, secretions and blood can be sucked, oxygen can be supplemented, and correct placement of the endotracheal tube can be confirmed. However, cost and expertise are limiting factors ⁹.

As free flap mandibular reconstruction is a long procedure, prevention of hypothermia and fluid management is of paramount importance. In our case, use of polyethylene

surgical drapes and warm blankets prevented hypothermia in the patient. This provided an economical alternative to an electrical heating mattress. Infusion of 6% hydroxyethyl starch caused hemodilution and reduced intraoperative and postoperative blood transfusion requirement.

At the end of surgery, prior to reversal, the oral cavity should be cleared of blood and secretions. The postoperative presence of airway oedema can cause airway obstruction and, in such situations, it may be prudent to leave the endotracheal tube in place. Also, care must be taken to ensure that patient is fully awake. Before extubation, the patient should be alert and extubation should be done only when all of the airway protective reflexes have returned to normal.

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