Airway obstruction following mandibular surgery - a case report

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To the Editor: Upper airway obstruction may be due to loss of muscle tone of the upper airway, with mechanical obstruction from the tongue, or foreign bodies such as teeth, dentures, secretions or tumours present in the airway. Loss of skeletal muscle tone of the upper airway is related to the inhibition of the gamma motor neuron system, which results in relaxation of the tongue and pharyngeal constrictor muscles. At the level of the oral passage in the supine position, obstruction is usually as a result of the tongue falling back, at the level of the soft and partially the hard palate. Rarely, does the tongue fall into the pharynx. At the level of the pharynx, two mechanisms of obstruction may operate, which are independent of the position or movement of the tongue. It is due to the base of the epiglottis coming close to the root of the tongue and laryngeal suspension can not only lead to problems with mastication and deglutition, but prolapse of the tongue may also compromise the airway requiring a permanent tracheostomy. The loss of tongue musculature is the most debilitating problem. Functional reconstruction after significant glossectomy is one of the great challenges in oromandibular reconstruction.2

Mandibular surgery can cause changes in the position of the hyoid bone and tongue, with consequent narrowing of the pharyngeal airway space, which may lead to obstructive sleep apnoea.3,4 Several studies have proved the effect of mandibular surgery on the upper airway space, which has been found to be decreased by 12-15%.5,6 Wickwire et al reported that mandibular surgery causes changes in tongue posture: because of change in the hyoid position.7 Berger et al commented that the pathologic changes such as vascular engorgement, fibrosis, oedema, and inflammatory cell infiltration can be the possible sequelae of airway obstruction rather than its cause.8

We report a patient who developed airway obstruction following mandibulotomy, requiring re-intubation.

Case Report

A 60-year old male, ASA I, weighing 50 kg was booked for revision of mandibular plating. He had undergone surgery for excision of an ameloblastoma two months previously. The whole of his right mandible except the condyle and coronoid process had been removed, and on left side the mandible was removed as far as the second molar tooth. A few days later, the intraoral sutures gave way, because of traction on the plate, thereby exposing it. He was unable to close his mouth. The patient was being fed via a Ryle’s tube. Pre-anesthetic assessment revealed an already open mouth (3 fingers). He required a large face mask (size 5) during preoxygenation, which could be held with difficulty over his open mouth. He was induced with thioneproton sodium 5 mg/kg7 and suxamethonium 2 mg/kg8 was given to facilitate nasotracheal intubation. This was achieved with a faciomaxillary tube size 7,5 mm ID. Vecuronium bromide 0,08 mg/kg9 was then administered. Intraoperative analgesia was provided with incremental doses of pethidine, and he was maintained on O2, N2O and 0,5% halothane. Surgery lasted for four hours. Revision plating could not be done, because the reconstruction plate could not be contoured to the curvature of the jaw. In addition, there was less tissue available. To avoid any possible airway obstruction during the postoperative period, the tongue was sutured to the floor of mouth from the lateral sides and from the undersurface. The intraoperative period was uneventful. He was reversed with neostigmine and glycopyrrolate in the recommended dosages. Dexamethasone 8mg was given to decrease tissue oedema, as is the routine in our institution for patients undergoing faciomaxillary surgery. Since the tongue had been sutured on all sides, extubation was performed with the patient fully awake. Immediately after extubation, the patient developed airway obstruction with stridor, and the oxygen saturation (SpO2) dropped to 85%, despite a FiO2 of 1.0. The patient also complained of difficulty in breathing. The use of a nasal airway failed to relieve the airway obstruction so a 7,5 mm Portex tube was placed nasally without sedation. Airway obstruction was relieved immediately and the SpO2 picked up.

He was moved to the respiratory intensive care unit for observation, and was successfully extubated the following day. perioperative period. Airway compromise that develops on induction of anaesthesia or intraoperatively is often diagnosed preoperatively. This may occur due to changes in the mouth, pharynx, trachea or bronchi. The causes of mandibular defects may be congenital and acquired, with the most common being post-oncological surgery, severe trauma and inflammatory diseases. All these result in a spectrum of aesthetic deformities and functional disability, which vary with the size and location of the segmental defect. Loss of bone leads to a cosmetic or functional disturbance. Loss of the structural support for the tongue and laryngeal suspension can not only lead to problems with mastication and deglutition, but prolapse of the tongue may also compromise the airway requiring a permanent tracheostomy. The loss of tongue musculature is the most debilitating problem. Functional reconstruction after significant glossectomy is one of the great challenges in oromandibular reconstruction.7

The exact cause of desaturation after extubation in our patient could not be established. It may be attributed to the residual effect of narcotics, and narrowing of the pharyngeal airway space as a result of previous surgery, compounded by the current surgical procedure. Muscle relaxation from general anaesthesia may also have contributed. Blood, saliva and mucus as a cause were ruled out. A nasal airway failed to relive the obstruction. Although it is difficult to predict which patients will develop airway obstruction in the postoperative period after faciomaxillary surgery, Chen et al devised an equation to predict pharyngeal airway space changes after mandibular surgery. This may be useful to predict the development of sleep apnoea syndrome in patients who have other risk factors such as obesity, short neck, macroclossis, a large uvula and excessive soft tissue around the nasopharyngeal region.9 There were no such contributing factors in our patient. Opinions differ over the need for postoperative intubation in such cases, but the endotracheal tube may be left in situ for the immediate postoperative period following major surgery around the pharynx, upper airway and resection of tongue, until reflexes have fully returned and the patient is stable with good analgesia.