Anaesthetic Management of a Case of Acromegaly in Remote Field Location

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Introduction

Acromegaly is a chronic, insidious, debilitating disease, which occurs due to acidophilic, or chromophobe adenoma of the pituitary resulting in excess secretion of growth hormone in an adult [1]. These patients often have multi system involvement including respiratory, neurological, neuromuscular and skeletal systems. Anaesthetic implication of this disorder is particularly significant in terms of changes in the upper airway and increased chances of pulmonary and cardiovascular complications [2]. We report the management of anaesthesia in a case of acromegaly posted for emergency surgery at a remote border area surgical centre.

Case Report

A 40 year old individual, 172 cm tall and weighing 79 kg was brought with history of mine blast injury left foot and left forearm. He worked as a porter in the Army and had accidentally stepped over a mine while going to a post. On reception, he had a pulse of 120/min, respiration 22/min and blood pressure 90/70 mm Hg. General examination revealed that hands were spade like and there was enlargement of jaws, lips and nasal cavity (Fig 1). The tongue was large and thick and airway was Mallampatti class IV with an enlarged uvula and epiglottis. The voice was hoarse and there was no history of visual disturbance. Locally, the left foot was mangled. Forefoot bones were shattered though movement at ankle joint was possible. There was extensive soft tissue injury over medial aspect of left forearm.

Systemic examination was essentially normal. Patient had good effort tolerance and heart sounds were normal. Random blood sugar was 90mg/dl and electrocardiogram was within normal limits. Skull radiograph done with the available 15 mA machine showed thickening of the skull with increased bony density, enlargement of paranasal sinuses and prognathism. Chest X-ray was normal. It was decided to take up this patient for an emergency surgery after stabilization. He was given one unit of colloid and 3 units of crystalloid solution and thereafter shifted to operation theatre.

Venous access could be obtained with great difficulty.

Patient was premedicated with glycopyrrolate 0.2 mg IV, ondansetron 4 mg IV and pethidine 25 mg IV. The sphygmomanometer cuff, ECG leads, pulse oximeter sensor were appropriately placed and monitored.

Management of airway was a big dilemma in this patient. We decided to attempt an awake intubation in this case. Xylocaine gargle was given with 5 ml of 2% solution and nares were tropicalized with 2% xylocaine ointment. A bilateral superior laryngeal block was performed using 2 ml of 1% xylocaine on both sides. The trachea was anaesthetized with 3 ml of 2% xylocaine given translaryngeally. A 7.0 mm cuffed endotracheal tube, coated with 2% xylocaine ointment, was thereafter inserted intra nasally with ear over the end of the tube. Once bilateral air entry was ensured, the tube was fixed and patient anaesthetized with thiopentone 375 mg, vecuronium 4 mg and maintained with oxygen, nitrous oxide (33%, 66%) and halothane.

A conservative amputation was done for the foot wound and heel flap was brought forward to cover the bone of the hind foot. It was not closed primarily and packed with betadine soaked gauze pieces. The forearm wound was thoroughly debrided, excised and sutured. Throughout the procedure, which lasted for one hour, the blood pressure and heart rate remained stable except for a transient drop in saturation to 80%, which improved after increasing oxygen concentration. The dose of nondepolarising muscle relaxant was not repeated.

At the end of surgery, reversal neuromuscular blockade

Fig. 1 : Some prominent acromegaly features

was done with glycopyrrolate 0.4 mg and neostigmine 2.5 mg IV. Since the patient was not adequately reversed, we decided to electively ventilate him in the ward. He was put on Dräger ventilator Evita 2 on SIMV mode with a frequency of 10 and FiO₂ of 0.5. All monitoring was continued and he was closely observed. Respiratory efforts continued to be minimal. About one hour in the postoperative period, the patient developed ventricular ectopics and went into ventricular tachycardia and ventricular fibrillation. Inj xylocard 50 mg IV was given followed by a DC shock of 200 J to which the patient responded and the rhythm reverted to sinus. About 8 hours in the postoperative period, the respiratory excursions improved and the patient remained haemodynamically stable throughout and was successfully weaned off ventilator and extubated 12 hours after the surgery.

Discussion

Acromegaly was first described by Saucerotte in 1801 and by Pierre Marie in 1886. It is seen in both men and women and occurs most frequently in the middle age. It is uncommon, with an estimated prevalence of 50-60 cases per million and an incidence of 3 to 4 cases per million per year [3].

Acromegaly is characterized by thickening of the subcutaneous tissues of the scalp, lips, tongue, face, hands, feet, overgrowth of the frontal sinuses, jaw and distal phalanges. The soft tissue and bony changes develop slowly over decades. There is also overgrowth of hair and sebaceous glands. But, this disorder is more than cosmetically disfiguring and may involve nearly all the systems. The patients often complain of weakness and tiredness. Asthenia causes slackening of ligaments with kyphosis, scoliosis and occasionally lordosis, so that the enlarged hands hang below the knees. This combined with the atavistic appearance produced by the beetling brows, prognathous jaw, and overgrowth of hair on the chest, produces the 'ape man' of the circus [4].

The acromegalic involvement of the upper airway is the prime cause of concern for the anaesthesiologist. It occurs due to overgrowth of the upper airway, increased length of the mandible, epiglottis and cords [5]. Polypoid masses in pharynx makes them prone for sleep apnea, which can be central, obstructive or mixed. In addition, laryngeal stenosis and cricoid narrowing is often present. The basal metabolic rate is high. Most individuals have neurological and musculoskeletal symptoms, including headache, nerve entrapment and paraesthesia (often due to carpal tunnel syndrome), muscle weakness and arthralgia. The cartilage hypertrophy and osseous overgrowth often leads to degenerative arthritis, or even spinal stenosis [6]. Skeletal changes make performance of regional blocks either technically difficult or unreliable.

Once it is suspected, ideally, advance tests like basal or random growth hormone (GH) assay are employed to confirm the diagnosis. GH concentration are measured and failure of hormone concentration to decrease 1-2 hours after the ingestion of 75-100g of glucose is presumptive evidence of acromegaly. A skull radiograph and CT scan shows enlargement of sella turcica.

Management of anaesthesia for these patients is to be considered in the backdrop of safety and appropriateness as also available logistic and infrastructural support. According to Agastas, systemic involvement should always be kept in mind while giving anaesthesia to these patients. Hypertension occurs in 1/3 cases, half of which have increased left ventricular mass or left ventricular wall thickness. Although, it is not established, whether cardiomyopathy occurs, acromegalics may develop congestive cardiac failure in the absence of another known underlying heart disease [7]. Our patient was from a remote border village away from the modern medical facilities and was not on any medication. He presented to us in a remote border area hospital as an emergency. Preoperatively, there was no evidence of pulmonary or cardiovascular involvement. Since both upper and lower limbs were involved, general anaesthesia was the only viable option. In the absence of a bronchoscope/LMA, awake intubation technique was chosen for securing the difficult airway. Effort was to minimize mechanical trauma to the upper airway and vocal cords, as additional edema would have resulted in more postoperative edema.

Due to the non availability of a peripheral nerve stimulator, the dose of non depolariser muscle relaxant was kept low. Aggressive monitoring could only help in timely diagnosis and treatment of serious ventricular arrhythmias. The patient had an uneventful course post extubation. He is now put on bromocryptine 20 mg BD and on regular follow-up at the centre.

This case highlights the difficulties in managing a case of acromegaly posted for a life saving surgery in a remote area surgical centre. High index of suspicion for pulmonary and cardiovascular complications is important. Effective management of difficult airway and continued intensive monitoring throughout the perioperative period only, can ensure safe and effective management of such patients with gratifying results.

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Goodnight sleep!

An elderly woman went into the doctor's office. When the doctor asked why she was there, she replied, "I'd like to have some birth control pills." Taken aback, the doctor thought for a minute and then said, "Excuse me, Mrs. Ganesh, but you're 75 years old. What possible use could you have for birth control pills?" The woman responded, "They help me sleep better." The doctor thought some more and continued, "How in the world do birth control pills help you to sleep?" The woman said, "I put them in my granddaughter's orange juice and I sleep better at night."

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Probability of Success

Patient: What is the probability of success in undergoing a bypass surgery?

Doctor: 100%!!

Patient: But how can you be so sure of achieving 100% success?

Doctor: On the day of convocation, my professor told me that when you practice medicine chances of failure will be 99% and success 1%. I have already attended 99 patients (failed to cure them) and you are the 100th!!

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