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Airway in Acromegaly – A Difficult Affair

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ABSTRACT

Acromegaly is a rare disorder caused by excessive production of growth hormone. It has been recognized as one of the most difficult situation in the airway management – both in tracheal intubation & laryngoscopy. The challenge lies at several levels because of many anatomical abnormalities. It has been found that fibreoptic intubation proved failure in these patients. Our study points to the fact that in Acromegaly, there should be a combined team approach from anesthesia and laryngology. The airway management should be taken in to consideration along with any surgery that the patient is planned for.

KEYWORDS : Acromegaly, difficult airway, awake intubation, failed awake intubation, failed fibre optic intubation

INTRODUCTION:

Majority of the studies regarding the complications in acromegaly are from Anaesthetists side rather than from Otolaryngology side.(1)However when both specialties are taken together the term difficult airway means either difficulty in tracheal intubation or difficulty in introducing laryngoscope. In our case it was difficulty in both intubation as well as laryngoscope introduction. It is important to identify the difficult airway before surgery to prepare for safe ventilation and intubation to avoid morbidity and mortality. Awake fiberoptic intubation, laryngeal mask airway and surgical airway are the options in difficult airway. And if it is going to be can't intubate can't ventilate situation the next resort is emergency tracheostomy.

Acromegaly is a rare disorder where both surgeon and anesthetist find it difficult to handle the airway due to the hypertrophy of soft tissue in the oralcavity, oropharynx & laryngopharynx due to excessive production of Growth hormone

GH hypersecretion is caused by adenoma and rarely by extrapituitary lesions. Patients present with classic features such as elevated GH level, pituitary enlargement on MRI and pathologic features of pituitary hyperplasia. Acral bony growth manifested as frontal bossing, increased hand and foot size, mandibular enlargement with prognathism,(Fig:3) and widened space between the incisor teeth. Other clinical features include hyperhidrosis, muffled voice, oily skin, arthropathy, kyphosis, carpal tunnel syndrome, proximal muscle weakness & fatigue, acanthosisnigricans and skin tags. Generalised visceromegaly like cardiomegaly, and macroglossia and thyroid gland enlargement occurs. According to the reports about 30% of patients have cardiovascular complications, 60% have upper airway obstruction with sleep apnea. There are both central sleep dysfunction as well as soft tissue laryngeal airway obstruction.(2)

Lab investigations include serum IGF –I levels, GH suppression, PRL, thyroid function, gonadotropins, sexsteroids. Treatment is surgical resection of GH secreting adenomas by transsphenoidal approach. somatostatin analogues are used as adjuvants.(2)

First case of acromegaly with laryngeal symptoms was reported by Chapell in 1896.Physical examination of these patients reveals prognathism, large thickened lips, large tongue, large nose,(Fig:3) enlarged larynx, coarse voice, thickening of epiglottis, thickening of aryepiglottic folds,ventriculer folds,vocal cords,arytenoid cartilages, fixation of vocal cords, palsy of recurrent laryngeal nerve. Studies shows that abnormal flow volume curves suggesting upper airway obstruction was found in more than 25 % of patients with acromegaly whose cardiorespiratory system was normal.(3)

A possible cause of fixation of vocal cords is paralysis of recurrent laryngeal nerve. There is overgrowth of the cartilaginous structures which stretches the nerves to result in immobility of the cords.(3) Another possibility is interference with movement of cricoarytenoid joints or thickening of laryngeal structures.(4) It has been found in certain cases that stridor is precipitated by an upper respiratory infection. (4)

CASE : Our case was a 47 year old male who was diagnosed as a known case of acromegaly of 15 years duration. He was on treatment since then with somatostatin analogues which he took once in 3 months and underwent trans sphenoidal decompression for pituitary adenoma one week post surgery at a local hospital. In the immediate postoperative period he developed stridor for which tracheostomy was done. However he was decannulated one week back and thereafter developed noisy breathing which worsened since 1 week and was presented to our emergency department with breathing difficulty. On examination he had inspiratory stridor with saturation fall at room air. His flexible endoscopic examination revealed bilateral immobile vocal folds, paradoxical movements, Sucking in of ventricular mucosa and bilateral edematous arytenoids. calcium were normal. Total count was elevated with predominant polymorphs, normal electrolyte and blood sugar levels.

After admission and stabilization the need for an emergency surgical airway was explained to the patient and relatives. Since there was a chance to offer better airway with a temporary lateralization we decided to do a suture cordopexy as an immediate relief. Consent for tracheostomy which could be decannulted later was also taken.

Since it was difficult airway the chief anaesthetist decided to do an awake intubation. The patient was prepared for awake intubation. Patient was prepared for fibreoptic intubation with adequate nasal decongestion and local anaesthesia, tracheal mucosa was anaesthetized using 4 % xylocaine which was injected through cricothyroid membrane.

Fibreoptic endoscope railroaded with endotracheal tube and introduced through the nasal cavity.(Fig:1) Epiglottis found falling and obscuring the view of glottis. With great difficulty glottis reached. However awake intubation failed in this case since the patient became uncooperative just before the introduction of scope tip in to the glottis. Fibreoptic scope couldn't be passed beyond the glottis into the sub glottis and trachea. Multiple attempts done and it was found that since the airway was critical patient couldn't tolerate even the tip of the fibreoptic scope which was obstructing the only available breathing space of the patient. So the fibreoptic intubation trial abandoned and intubation tried with bougie which was successful.

Fig 1: Attempt for awake intubation
The laryngoscope introduction was very difficult in this case because of the large tongue.

Fig 2: Large Tongue which was pulled out using a suture for intubation and insertion of Kleinsassers suspension laryngoscope

Visualisation of larynx using Kleinsassers suspension Laryngoscope was also difficult. Since we were planning for suture cordopexy on right side, we marked the suture points over the thyroid cartilage. Taking suture through the thyroid cartilage was also difficult since it was ossified and thickened. There was edema of the supraglottic tissue. We decided to manage him in the surgical ICU with steroid and adrenalin nebulization along with oxygen support. After discussion with anaesthetist we decided to extubate him without tracheostomy. Few minutes after extubation he desaturated and it was difficult to ventilate with mask and reintubate. So an emergency tracheostomy was done through the previous scar which was found to be actually through the cricothyroid space so we did a proper tracheostomy. Previous scar closed with sutures. Postoperative period was uneventful.

Fig3: Lateral view of the patient post tracheostomy. All facial features of acromegally can be well seen

He was send home with shileys tracheostomy tube. He was advised to come for follow up at regular intervals. On next visit we found that there was a cut through in his sutures of cordopexy So we planned for an Endoscopic Laser cordotomy so that decannulation would be possible. But to our surprise we couldn't even expose the larynx due to persisting edema of the oropharynx as well as the supraglottis. So the procedure was abandoned. His initial follow up visits showed edematous supraglottic and glottic area which took quite a long time to subside.

DISCUSSION:

Few Case reports of airway difficulties associated with anaesthesia in acromegaly have been published earlier. It is a real challenge for both anaesthetist and surgeon. Among many criterias tested as potential predictors for difficult intubation three simple and easy to perform examinations are modified mallampati, measurement of thyromental distance and head and neck movements. Among these in this case thyromental distance was actually more than normal requirement and head and neck movements were normal, but because of macroglossia modified mallampatti was unfavourable.

There were studies regarding the applicability of fibreoptic intubation in acromegaly cases, the most commonly used tests for prediction of intubation difficulties do not apply to fibreoptic intubation. Eventhough Fibreoptic intubation has been recognized as one of the best methods to manage a difficult airway,(5) the predictive parameters of difficult fibreoptic intubation have not been studied.

Though the need for surgical airway was well explained to the patient and bystanders, they were reluctant at first because to them he was suffering from the same symptoms for many years and were not convinced about the critical airway. On detailed interrogation he always had snoring and sleep apnoea which was part of acromegaly and recent surgery which ended up in tracheostomy and subsequent decannulation was not well discussed in detail.

Fibreoptic intubation failed since the tip of endoscope was obstructing the only glottic space available for the patient to breathe. The edema of supraglottis due to the previous intubation added up to the misery. Cases were reported with the same history that repeat attempts at endotracheal intubation precipitate the need for emergency tracheostomy.(6) In many reported cases it has been found that fiberoptic intubation failed.

Repeated intubation causes further trauma and edema which makes exposure of larynx more and more difficult on repeated attempts, that may be the reason for inability to expose the larynx for laser cordotomy.

CONCLUSION:

Difficult airway is a concern for both the anesthetist as well as the surgeon. A difficult airway is considered when one of following is involved: difficult laryngoscopy and difficult mask ventilation and / or difficult tracheal intubation.(7) The important aspect such as identifying the difficult airway before manipulation was clearly carried out here. When a patient with acromegaly is taken for a surgery it should well explained to the patient regarding the potential airway problem. It should be a team approach with inclusion of an airway anesthetist. The manipulation of the already compromised airway will lead to further tissue overreaction and soft tissue swelling which impair the feasibility of managing the airway leading to the can't intubate can't ventilate scenario. Surgical procedures such as cricothyroidotomy , tracheostomy and transtracheal jet ventilation are the options when faced with the cant intubate, cant ventilate situation which was carried out well in our situation. An elective tracheostomy should be done in the first surgery itself and should not be decannulated until the tissue edema subsides. Also it is better to decannulate the patient at a much later date after the definitive procedure for airway. Among the procedures suture cordopexy should not have attempted since the cartilage is not in favor of surgery as well as the chance to cut through is more. In an acromegaly patient with bilateral abductor palsy the most favourable surgery for airway is endoscopic laser posterior cordotomy

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