

# Anaesthetic Management in a Patient with Pituitary Macroadenoma: A Case Report

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## ABSTRACT

**Introduction:** Pituitary macroadenoma is the most common suprasellar mass in adults and is the commonest indication for transnasal transphenoidal hypophysectomy. Pituitary adenomas greater than 10 mm in size are pituitary macroadenomas. They are approximately twice as common as Pituitary microadenomas.

**Case report:** We report a case of Pituitary macroadenoma with difficult airway scheduled for transnasal transphenoidal excision of the tumour.

**Conclusion :** Pre operative evaluation of airway, endocrine and neurological status are primary concerns in these patients. The major problems to the anaesthesiologists are airway difficulty, neurosurgical anaesthesia, co-existing illness, steroid supplementation, permissive hypercapnia and positioning during surgery.

**Keywords:** Pituitary Tumours, Anaesthetic Concerns, Neurosurgical Anaesthesia

## INTRODUCTION

Pituitary macroadenomas are the most common suprasellar mass in adults. It is defined as Pituitary adenomas greater than 10 mm in size and are approximately twice as common as Pituitary microadenomas. The presenting features are often due to increased or decreased secretion of hormones and the most commonly performed surgery is transnasal transphenoidal pituitary surgery. Herewith we are presenting a case of pituitary macroadenoma with difficult airway posted for transnasal transphenoidal excision of the tumour.

## CASE REPORT

A 69 year old male presented with history of severe head ache, vomiting, giddiness and difficulty in breathing. He had diminution of vision, decreased effort tolerance and recent onset of obstructive sleep apnoea symptoms. He is a known hypertensive and diabetic on regular treatment with history of pulmonary tuberculosis treated in the past. Vital signs were within normal limits. Patient presented with acromegalic features like enlarged lips, nose, tongue, prominent supra orbital ridges, prognathism, thickened skin, enlarged hands and feet with acral enlargement. Neuro-cutaneous markers were absent.

Airway examination showed deviated nasal septum to right side, deranged dentition, inadequate mouth opening, protuberant jaw and restricted neck extension. Mallampati class was IV with 8 cm thyromental distance. Systemic examinations were normal.

The routine blood investigations were within normal limits.

Hormonal analysis showed increased growth hormone levels while other pituitary hormones were decreased. Chest X ray showed bilateral lung infiltrates with emphysematous changes. Electrocardiogram (ECG) revealed sinus rhythm with q wave in leads II,III and avF. Echocardiogram showed mild left ventricular hypertrophy, mild pulmonary artery hypertension (Right Ventricular Systolic Pressure - 42mm Hg) with left ventricular diastolic dysfunction. Dobutamine stress test was negative. Field of vision revealed right homonymous hemianopia. Magnetic Resonance Imaging of brain showed mass lesion measuring 15 x 15 x 23 mm in the sella with mild suprasellar and bilateral parasellar extension. Opinions were obtained from multi disciplinary specialities like cardiology, pulmonology, endocrinology and ophthalmology. After preoperative workup, patient was posted for elective transnasal transphenoidal excision of the tumour under American Society of Anaesthesiologists (ASA) physical status 3. Plan of anaesthesia was general anaesthesia controlled ventilation with awake fiberoptic intubation with invasive monitoring – Central Venous line and arterial line. Informed consents were obtained for general anaesthesia with controlled ventilation, along with consent for fiberoptic intubation, invasive lines and postoperative ventilation. Starvation guidelines were followed along with anti-aspiration and anticonvulsant prophylaxis. On the day of surgery in the pre operative room a large bore 16G intravenous line was secured in non dominant dorsum of the hand. Patient was premedicated with intra muscular Glycopyrrolate 0.2 mg and airway was anaesthetised with 2ml of 4% lignocaine nebulisation and 10% lignocaine oral spray. Patient was shifted inside the operating room and pre-induction monitors like ECG, Non Invasive Blood Pressure and SpO<sub>2</sub> were connected. Left radial artery cannulation was done under local anaesthesia and invasive blood pressure was monitored. Pre oxygenation was done with 100% oxygen for 5 mins. Fiberoptic intubation was carried out orally with

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Spray as you go technique. Analgesia was supplemented with intravenous(iv) Fentanyl 100 mcg.

After visualisation of the vocal cords, airway was secured with 8.5 mm cuffed endotracheal tube(ETT) and fixed at 22 cm at the incisor level. Propofol and Rocuronium were given. ETT position was reconfirmed with capnography. Throat packing was done.

Anaesthesia was maintained with Oxygen-Nitrous oxide, Isoflurane, Rocuronium and Dexmedetomidine infusion. Post intubation right Internal Jugular vein cannulation was done and CVP monitored. Urinary bladder was catheterized and urine output monitoring was done. Rectal temperature and neuromuscular monitoring were done. Intra operatively analgesia was supplemented with iv Paracetamol, anticonvulsant dose was repeated and injection Hydrocortisone 100mg iv was given. Patient was hemodynamically stable throughout the procedure. Estimated blood loss was around 300ml.

At the end of the procedure, throat pack was removed and reversal was given. Patient was extubated after ensuring adequate recovery. Postoperatively patient was monitored in neurosurgery intensive care unit for 48hrs. Patient was discharged on Day 10.

## DISCUSSION

Pituitary tumours constitute 10% of the intracranial tumours. Pituitary gland weighs 0.5 to 0.9 gms measuring 15 x 10 mm in size.<sup>1</sup> The gland lies in the sella turcica at the base of the skull. Clinical presentation of the pituitary tumor may be either due to altered secretion of hormones or due to mass effects.

The anaesthetic management requires the knowledge of neurosurgical aspects of anaesthesia in general and pituitary disease in particular. The pathophysiology involving hormonal alterations due to pituitary disease may have significant effect on outcome of surgery. Peripheral venous access and invasive monitoring are the big challenges to an anaesthesiologist.

The aim of anaesthetic technique must be targeted towards hemodynamic stability, maintaining adequate cerebral oxygenation and normal intracranial pressure.<sup>4</sup> Anaesthesiologist faces difficulty in mask ventilation, laryngoscopy and intubation due to large tongue and receding chins. A thorough assessment of airway is mandatory in acromegaly patients.<sup>2</sup> Facial features may be coarse and bone overgrowth may lead to prognathism.<sup>3</sup> Hence fiberoptic intubation is the gold standard technique in securing the airway. Nasal obstruction due to nasal packing done after the procedure must be explained to the patient.<sup>9</sup>

The risk in the trans sphenoidal approach includes persistent CSF rhinorrhoea and the associated risk of postoperative meningitis, panhypopituitarism, transient DI, vascular damage, cranial nerve injury, cerebral ischaemia, and stroke as a result of vasospasm or thromboembolism.<sup>12</sup> Prophylactic anti-convulsant must be given.

Positioning during surgery is of major concern and there is an increased risk of air embolism in the sitting posture.

Intra arterial measurement of blood pressure is mandatory.<sup>5</sup> Permissive hypercapnia with PaCO<sub>2</sub> of 60 mmHg is useful to increase the ICP, favouring the shift of suprasellar part of the tumour into the sella for easy surgical excision.<sup>6</sup> Monitoring glycaemic status intraoperatively is also significant.

There is a negligible blood loss during trans sphenoidal surgery unless there is an injury to major vessels such as carotid artery. Intraoperatively structures likely to be damaged are cranial nerves II to VI, optic nerve or chiasma and venous sinuses. Olfactory nerve damage leads to anosmia.

Valsalva manoeuvre is done to test for any CSF leak after excision of the tumour and the sella is packed with autologous fat to prevent CSF leak.<sup>7</sup> Adequate analgesia should be supplemented intraoperatively and postoperatively. Care must be taken to remove throat pack towards end of the surgery.

Emergence from anaesthesia should be smooth, avoiding coughing and bucking. Post operatively there is increased risk for airway compromise due to difficult airway and associated history of Obstructive Sleep Apnoea.<sup>13</sup> The level of consciousness, eye movements and visual fields must be tested regularly.<sup>10</sup> Neuroendocrine abnormalities are common. Hormonal replacement therapy is required in all patients. Steroids to be tapered. Endocrinologists must be consulted for the hormonal status of the patient and regular follow up is mandatory.<sup>11</sup>

## CONCLUSION

Pituitary surgery requires a multidisciplinary co-ordinated teamwork consisting of endocrinologist, neurosurgeon, radiologist and anaesthesiologist for better care and outcome of the patients. Pre operative optimisation of the patient based on coexisting illness is needed. Measures should be taken to manage difficult airway. Fast recovery from anaesthesia is vital because early neurological assessment can disclose serious surgical complications. Long term follow up of the patients with endocrinologists to assess their hormonal status is mandatory.

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