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ANESTHETIC MANAGEMENT FOR ROBOTIC BILATERAL ADRENALECTOMY AND TOTAL THYROIDECTOMY WITH RADICAL NECK DISSECTION: CASE REPORT

Anaesthesiology

Dr Seema Shukla Consultant, Rajiv Gandhi Cancer Institute and Research Centre

Dr Sweta Gulati Consultant, Rajiv Gandhi Cancer Institute and Research Centre

Dr Anita Kulkarni Senior Consultant, Rajiv Gandhi Cancer Institute and Research Centre

ABSTRACT

Pheochromocytoma (PHEO) is a rare catecholamine producing neuroendocrine tumor. It should be early diagnosed and treated. Adrenalectomy is the gold standard treatment for these types of tumors. With the advancement of minimal invasive surgery robotic adrenalectomy is preferred over open surgery. In this report we discuss anesthesia management of Bilateral robotic adrenalectomy and total thyroidectomy with radical neck dissection.

KEYWORDS

Pheochromocytoma, minimal invasive surgery, Robotic adrenalectomy.

INTRODUCTION

Pheochromocytomas (PHEO) are catecholamine secreting neoplasms originating from the adrenal medulla, it may have an extra adrenal origin. It is manifested as sweating, headaches, palpitations and hypertension.[1] PHEO is found in 0.05 to 0.01 percent of the general population. It is typically detected in age group of 40-50 years with a slight female preference.[2] Multiple Endocrine Neoplasia (MEN) is a syndrome which involves more than one endocrine gland. There are 3 types and further subtypes of MEN. MEN2A is characterized by medullary thyroid cancer (97%) with phaeochromocytoma (50%) and hyperparathyroidism (20%)[3,4].

With surgical advancements, Robotic-assisted adrenalectomy is commonly performed to remove pheochromocytoma. Catecholamines released by these tumors during surgery can induce sudden surges in heart rate and blood pressure which can result in hypertensive crisis. While the surgical stimulation is much less as compared to open surgery but still significant hemodynamic disturbances seen during perioperative period.

We report a case of MEN2A syndrome who underwent Bilateral Robotic adrenalectomy followed by total thyroidectomy and radical neck dissection. This case highlights hemodynamic fluctuations associated with condition and also discuss specific anesthesia consideration for Robotic adrenalectomy. Since there is no patient identifiable information shared in this case , no IRB approval was required.

Case Presentation

A 46 year old ASA grade 2 male who weighed 67 kg presented to our hospital with neck pain radiating to right ear since 5-6 months and neck swelling first noticed 1 year back. He has history of D.M and hypertension for 6 yrs and was on medication. There was no other significant history.

CECT – b/l thyroid lobes SOLs 2.1* 2.7 c.m (Rt)1.6*2.9 (Lt). B/l adrenal lesion seen3*2.5*4 cm (R) and 4.8*6*6.3 (L). serum calcitonin was raised. Patient was investigated further for MEN 2 syndrome. Biopsy showed Medullary ca thyroid. PET-CT showed metabolically active thyroid lesion with b/l cervical lymphnodes and b/l Adrenal masses. On examination right thyroid nodule mobile, moves with deglutition. 24 hr urine VMA (47.19 mg),urine for metanephrines(1830ng/l) and normetanephrines(3590ng/l) were markedly raised.genetic test was done to support diagnosis of MEN2 A.

After consultation with urology and head and neck Robotic Bilateral adrenalectomy and total thyroidectomy with radical neck dissection was planned. Tablet Phenoxybenzamine 10 mg tds along with betablocker was given for 10 days before surgery to control intraoperative blood pressure fluctuations. All routine investigations was done and blood products were arranged for surgery. On the day of surgery his B.P was 137/80 and H.R 85/min. Monitors E.C.G, arterial line, pulse oximeter ,central venous pressure , bispectral index monitor were applied. Two wide bore i/v canula was placed . infusions of nitroglycerine (NTG), Noradrenaline(norad), Sodium nitroprusside(S.N.P) were prepared.

Anesthesia was induced with propofol 2mg/kg ,fentanyl 2 mcg/kg and vecuronium 0.1mg/kg and intubated uneventfully and put on mechanical ventilation. Anesthesia was maintained with oxygen/air, sevoflurane and propofol and vecuronium infusions. Inj.morphine 3mg was given prior to incision . It was planned to start with left adrenalectomy first, docking was done with da vinci robotic surgical platform.[Fig.1 & 2] Patient was hemodynamically stable throughout the induction, positioning, docking and before adrenal gland manipulation. During dissection of tumor there were gradual increase in blood pressure to a peak of 203/96 just prior to clamping of the effluent vein. Inj.esmolol , propofol boluses was given and N.T.G, S.N.P infusions were started. There were several surges in blood pressure and heart rate. Dose adjustment of propofol, S.N.P, fentanyl was done to maintain the blood pressure in normal range. once left adrenalectomy was done there were no more hemodynamic changes. Position was changed and right adrenalectomy was started but fluctuations in blood pressure was higher during right side and doses was adjusted accordingly. After removal of specimen gradual fall in blood pressure was observed, requiring Norepinephrine infusion and phenylephrine boluses, colloids and crystalloids boluses were given to maintain c.v.p of 10-12 mmHg . Patient was turned supine and open total thyroidectomy with radical neck dissection was done. Infusion of norepinephrine was continued till surgery to keep the blood pressure stable. Patient was shifted to surgical I.C.U paralyzed and sedated and he was extubated and weaned off norepinephrine infusion there after 12 hrs. Patient was shifted to ward and discharged later.

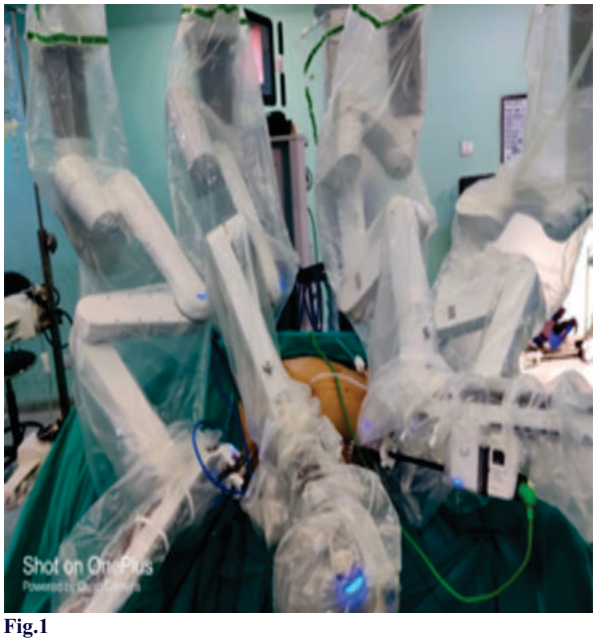

Fig.1

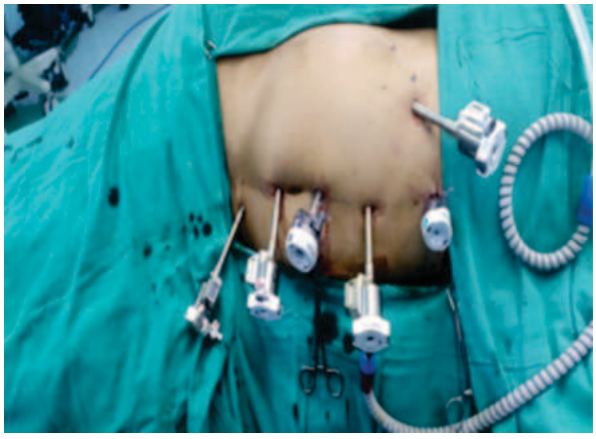

Fig. 2

DISCUSSION

Malignant PHEO is catecholamine secreting tumor of chromaffin cells of the adrenal medulla[2]. Surgical treatment of malignant PHEO is an adrenalectomy or debulking procedure[5]. Minimally invasive surgery is preferred over open surgery because it causes smaller incision, less pain, shorter hospital stay and rapid recovery. Anesthesia management of patients with PHEO undergoing Robotic surgery have unique challenges due to sympathetic overactivity. Catecholamines released during laryngoscopy, intubation, surgical incision and pneumoperitoneum may aggravate hypertension and tachycardia, which can cause arrhythmias and myocardial ischemia. Tumor manipulation during surgery is associated with release of catecholamines causes hypertensive crisis, and can cause myocardial ischemia or stroke.[6] Nitroprusside ,NTG,and calcium channel blockers should be used to treat hypertension.

Preoperative optimization is important, once the diagnosis is made alpha adrenergic blockade (Phenoxybenzamine) should be started 10-14 days before surgery to normalize blood pressure. Intravascular volume should be repleted after successful alpha blockade. Beta blocker to control heart rate can be started after alpha blockade not before it. Premedication with BZP to relieve anxiety should be considered. Intraoperative period is typically divided in two phases first phase before ligation of effluent vein is associated with hypertension but second stage after removal of tumor is associated with rebound hypotension because of sudden withdrawal of catecholamine stimulus. In our case after right adrenalectomy patient required noradrenaline infusion. Procedure is performed in general anesthesia . some agents like ketamine, morphine, and atracurium should be avoided due to increased sympathetic stimulation and histamine release.[7] Sevoflurane is the most commonly used inhalational drug for PCC resection maintenance due to its low arrhythmogenic risk and favorable hemodynamic profile[8]. In robotic surgery one concern is chances of endotracheal tube migration causing hypoxia. A three point ET cuff palpation technique is easy to use, reliable and successful technique to prevent endobronchial tube migration.[9]

Thyroidectomy and radical neck dissection takes time in cancer patients so if possible we recommend to do this in second stage for better hemodynamic stability. But in our case it was done in same sitting, case was successfully managed for all the hemodynamic fluctuations.

CONCLUSION

We didn't have any previous experience of patient with MEN2A syndrome for pheochromocytoma surgery and there was not much literature available for anesthesia for this case, so we managed this case with our experience and knowledge of previous cases of adrenalectomy for pheochromocytoma. This case was managed successfully intraoperatively and postoperatively as well.

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