ORIGINAL RESEARCH PAPER

Anaesthesiology

KEY WORDS:
Catecholamines, Norepinephrine, Hypertension.

ANAESTHETIC MANAGEMENT OF A CASE OF PHEOCHROMOCYTOMA - A CASE REPORT

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ABSTRACT

Pheochromocytoma is a rare catecholamine secreting tumour originating usually from adrenal medulla and produces signs and symptoms due to excessive catecholamine secretion.[4,5] Pheochromocytoma is called '10% tumour'[4] because 10 percent are bilateral, malignant, extra-adrenal, multiple and familial. Pheochromocytoma is one of the few causes of hypertension that can be treated surgically.[4] Detection is mandatory for the potential cure of hypertension and to avoid the lethal effects. Pheochromocytoma has an overall good prognosis, with a 5-year survival greater than 95% in benign tumours and recurrences below 10% for malignant tumours.[5]

CASE REPORT

27yr old female presented to our hospital with complaints of paroxysmal attacks of hypertension causing palpitation, dizziness and headache since 10 months with history of pregnancy induced hypertension and intrauterine death complicated pregnancy. After delivery of the dead baby, patient was followed up for hypertension for ten months.

Clinical suspicion of pheochromocytoma was raised by 24 hour urinary catecholamine level and abdominal ultrasonography. The diagnosis was confirmed by CT scan of abdomen.

Patient was started on Tab. Phenoxybenzamine 10 mg O.D. three weeks prior to planned elective surgery. Tab. Propranolol 40 mg O.D. was started one week later to control tachycardia.

No other significant medical history could be elicited.

General physical examination - Patient is average built, conscious and cooperative.

Airway- Modified Mallampatti Grade I, Mouth Opening- 3 cms.

Pulse- 92/min in right radial artery. B.P. 124/82 mm Hg in left arm in supine position.

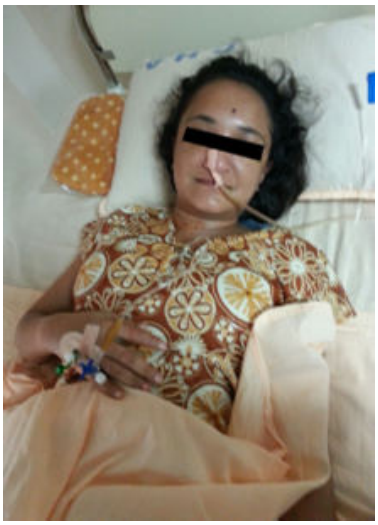


Image 1- Patient in hospital setup.

INVESTIGATIONS:

Hb 12.7mg/dl, T.L.C 8400/cmm Plt. 3.56 lakhs/cmm

Urea 12.7 mg%, Creatinine 0.62 mg% , Serum Sodium- 135 mEq/L Serum Potassium- 4.36 mEq/L.

Total Bilirubin0.82 mg% , Chest skiagram (P.A.View) - normal , Electrocardiogram- normal

2D Echocardiography- Left ventricular ejection fraction- 60% with mild left ventricular hypertrophy

C.T. Scan – 4.3 x 6.8 cm large lobulated heterogenous hyperenhancing lesion in left retroperitoneum para-aortic and infra-renal in position suggestive of extra adrenal paraganglioma.

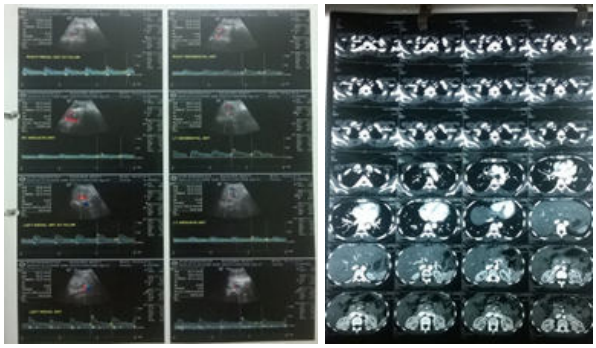


Image 2- CT scan of the patient showing the tumour size and location.

After all the necessary workup and investigations open resection of the tumour was planned owing to the large size of tumour, the blood vessels surrounding it and possible excessive release of catecholamines that could have occurred during creation of pneumoperitoneun in laproscopic surgery. High risk consent for surgery and anaesthesia was obtained.

ANAESTHETIC MANAGEMENT:

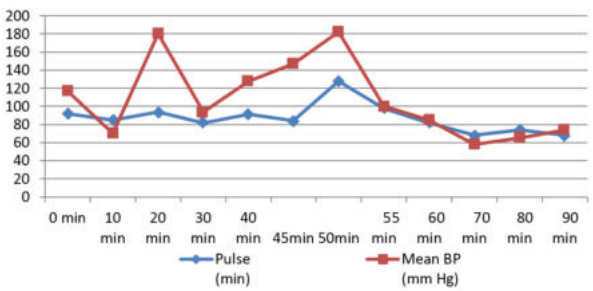
- An intravenous line with 18G intracath was secured and hydration was started.
- In the operative room monitors were attached and basal vitals were noted.
- Epidural catheter was placed.
- Preemptive analgesia was achieved by Inj. Bupivacaine 0.25% 10cc via the epidural catheter.
- Patient was premedicated with Inj. Ondansetron

0.15mg/kg and Inj. Fentanyl 2 µg/kg IV.

- Preoxygenation was done with 100% O_2 for 3-5 minutes using Bain's circuit.
- Induction was achieved with Inj. Propofol 2mg/kg and Inj. Vecuronium 0.1 mg/kg to facilitate intubation.
- Patient was intubated with 7.5mm id sized endotracheal tube. After checking bilateral air entry, cuff was inflated and tube was fixed.
- Maintainance : 50% O_2, 50% Nitrous Oxide mixture with Isoflurane traces and Inj. Vecuronium bromide 25 µg/kg IV. Patient was mechanically ventilated with tidal volume of 6ml/kg body weight and frequency of 12 cycles per minute using ventilator.
- An arterial line was secured using 20G intracath for close observation of the preoperative fluctuation of blood pressure. Right internal jugular vein was catheterized with a 7.5F central venous catheter for the purpose of central venous pressure monitoring, preoperative administration of fluids, inotropes and vasopressors.
- Intraop fluctuations of vitals was closely monitored and managed with appropriate drug therapy.
- Tumour mass was resected at 60min from start of surgery.
- Patient was reversed with Inj. Glycopyrollate 8mcg/kg and Inj. Neostigmine 50 mcg/kg at 75 min and extubated at 80 min.
- Postoperatively patient was conscious, cooperative and haemodynamically stable (with minimal vasopressor support) and good analgesia.
- Inj. Bupivacaine 0.25% 10cc given for pain relief at the conclusion of surgery. Inj. Tramadol 75mg diluted in 10cc of normal saline was administered via the epidural catheter 8hrly thereafter for next two days and epidural catheter was removed on postoperative day 3.

Table 1- Intraop Monitoring of vitals.

Time	Pulse (/min)	I.B.P. (mm Hg)	SPO2 (%)	DRUG THERAPY
0 min	92	151/100	99	Premedication and induction agents
10 min	85	108/50	98	
20 min	94	228/157	99	Inj. NTG 0.1mg/ml drip started and titrated according to B.P.
30 min	82	128/77	99	
40 min	91	170/108	97	Inj Esmolol iv stat given (1mg/kg over 30 secs.)
45min	84	182/130	99	Inj Labetalol iv stat given(20mg I.V. over 2 mins.)
50min	128	168/140	97	Inj. Sodium Nitroprruside drip started and continued a/c B.P.
55 min	98	146/77	98	
60 min	82	100/77	99	
70 min	68	85/44	95	Inj. Noradrenaline started(10 mg in 500 ml NS) and titrated a/c B.P.
80 min	74	96/50	99	Reversal, extubation
90 min	68	90/58	99	Patient shifted with Inj. Norad support .02mg/hr



Graph 1- Graph showing preoperative fluctuations of vitals.

Image 3- Multipara monitor showing the intraop vital trends

Image 4- The photosensitive nitroprusside drip covered in black opaque sheet.

DISCUSSION:

Pheochromocytoma is a catecholamine secreting tumour originating usually from adrenal medulla. Signs and symptoms are due to excessive catecholamine secretion. Surgical resection is the treatment of choice. Optimal preparation for pheochromocytoma resection involves preoperative optimization of patients blood pressure as well as correction of possible hypovolemia. Alpha blockade has been the mainstay of preoperative preparation for pheochromocytoma patients and has had a long track record of safe use. In most centers, a combination of alpha-adrenergic and beta-adrenergic blockade is routinely used. It is well known, beta blockade should never be used in isolation and only after an adequate length of alpha blockade owing to the catastrophic hypertensive crisis that would ensue with unopposed alpha receptor stimulation. [4] Intraoperative goals include avoidance of drugs or maneuvers that may provoke catecholamine release or potentiate catecholamine action, and maintenance of cardiovascular stability. Hypertention frequently occurs during tumour manipulation on the other hand significant hypotension may develop following ligation of tumour's venous drainage. [4,5] Hypertension during tumor manipulation is refractory and a mixture of antihypertensive medications are recommended to control it. Increasing the depth of anaesthesia is also an option. Hypotension following tumour vein ligation is usually significant and occurs due to immediate decrease in plasma catecholamines and residual effect of alpha blockade. Fluids are indicated as the primary treatment modality here, vasopressors should be viewed as a secondary treatment. [4,5]

CONCLUSION:

Optimization of patient charachterstics is of utmost importance in preoperative preparation of pheochromocytoma resection surgery which includes prior administration of an alpha blocker supplemented with a betablocker if required and correction of possible hypovolemia. Wide fluctuations in Blood Pressure are inevitable during surgical resection of pheochromocytoma. Hypertension during tumor manipulation is refractory and a mixture of antihypertensive medications are recommended to control it.

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