



ANAESTHESIA MANAGEMENT FOR CAROTID PSEUDO ANEURYSM AFTER FNAC BIOPSY IN A KNOWN HYPOTHYROID PATIENT.

SUJATHA

Department of Anaesthesiology, MADRAS MEDICAL COLLEGE AND GOVERNMENT HOSPITAL

GENERAL

Abstract : A 50yr old male patient who was a known hypothyroidic on treatment with a swelling in the neck for 2month duration following a FNAC biopsy, investigated and diagnosed as carotid pseudoaneurysm due to the FNAC procedure, posted for surgery. Problems anticipated in these patients are difficult airway due to large neck swelling, blood loss from the aneurysm, intraoperative maintenance of cerebral perfusion during cross clamping and measures of cerebral protection. Here we have done a case of common carotid artery pseudo aneurysm with a huge neck mass with distorted airway.

Keyword : carotid pseudo aneurysm, difficult airway, unilateral vocal cord palsy



picture showing huge neck swelling

INTRODUCTION

Carotid pseudo aneurysm is a rare type of a neurysm which may be due to infective, traumatic, atherosclerotic, dysplastic, iatrogenic causes. Aneurysm usually present as a pulsatile neck swelling with or without neurological impairment like stroke, TIA, visual disturbance, difficulty in breathing due to tracheal deviation, difficulty in swallowing or obstruction which may present a challenging airway to the anaesthetist during surgeries. Carotid pseudo aneurysm may be iatrogenic due to FNAC of thyroid gland. FNAC is a simple reliable and commonly done diagnostic procedure for thyroid nodule. FNAC may be done by palpation guided method or ultrasound guided method. Complications of FNAC are intranodular bleeding, accidental neurovascular injury which is more common in palpation guided FNAC. This procedure may injure the common carotid artery causing aneurysm leading to huge neck swelling which may deviate or obstruct the trachea and cause recurrent laryngeal nerve compression.

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CASE HISTORY

A 40 year old male was admitted in the vascular surgery department, who is a known case of hypothyroidism on tab.eltroxin-100mic gm/day for the past 6months. He complained of a huge neck swelling which developed insidiously to achieve the present size following FNAC procedure done two months before for a thyroid swelling. He gave h/o hoarseness of voice for the past 2month. No h/o giddiness/transient ischemic attack / syncope /dysphagia / claudication or dyspnoea. He did not give h/o palpitation, heat intolerance, anxiety, weight loss, increased appetite.

Also there was no h/o excessive weight gain, early fatigability or cold intolerance. There was no h/o trauma, DM, HT, CVA, IHD, or TB. He was not a smoker, or alcoholic. He was a farmer by occupation. He gave past h/o herniorrhaphy done 15 yrs back which was uneventful.

Examination

Patient was conscious, oriented, afebrile. CVS- Normal.

RS: -Normal, Abdomen: Normal. CNS-higher functions normal, no focal neurological deficit. motor, sensory system-normal, cranial nerves-all are normal except left sided recurrent laryngeal nerve palsy. On examination the swelling of 6cm x 6cm present over the left side of the neck extending from the left ramus of the mandible to upper border of the left clavicle, and laterally extending from anterior border of sternocleidomastoid to midline of the neck. It was firm in consistency, warm and not pulsatile. left side carotid could not be palpated.

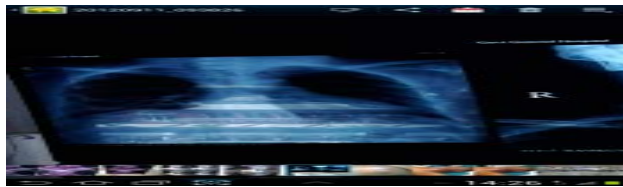
Airway examination

Mouth opening was MMS 2. Interincisor distance more than 3cm, thyro-mental distance couldn't be assessed due to obliterated land mark, neck movement restricted due to mass. Difficult airway anticipated. Ent opinion sought and their examination revealed a hooded epiglottis, Left vocal cord palsy with a mobile right vocal cord.

Investigations:

Hb-7.5g%, blood sugar-90mg/dl, urea-26mg/dl, creatinine-0.7, Na-129, k-5.2, thyroid function test is normal, ECG-normal sinus rhythm, Chest x-ray confirmed gross deviation of the trachea to the right side & lung fields are normal, Neck x-ray **AP view**- gross tracheal deviation to Right, Neck X-ray lateral view- No tracheal compression. ECHO-no regional wall motion abnormalities, normal systolic function, no diastolic dysfunction. USG neck-large cystic swelling in the anterior compartment of the neck, MRI neck showed pseudoaneurysm arising from the left common

carotid artery. 3D CT angiogram confirmed the diagnosis which shows eccentric aneurysm from common carotid artery with clots inside



x-ray chest with gross tracheal deviation



Preoperative preparation:

Pre operative fasting guide lines followed, high risk informed consent obtained, ventilator kept ready, adequate blood reserved, difficult airway cart kept ready.

Intra operative management:

Iv line started-Right dorsum of hand with 18g iv cannula, left femoral central line secured through modified Seldinger technique, and the monitors connected.

Monitors:

IBP, SPO₂, ECG, urine output, temperature, and CVP. Premedication with Inj.Glycopyrrolate 0.2mg, inj fentanyl 140 mic.gm and inj.midazolam 2mg given iv. Trial laryngoscopy done after informing the patient, vocal cord visualized (Cormack lehane 1 with right vocal cord mobile with left side palsy), patient induced with inj thiopentone-150mg, after confirming the possibility of ventilation with bag and mask, inj.suxamethonium 100mg, and inj xylocard-60mg given and trachea intubated naso tracheally with 7.0 size cuffed endo tracheal tube. Anaesthesia maintained with N₂O:O₂ 40 % : 60 %, sevoflurane 1-2% and inj. Vecuronium-8mg iv given Intra operatively. The vital signs maintained around the pre operative value. Intra operative ABG taken to evaluate PH, PO₂, PCO₂, HCT which was kept normal.

Cerebral protection strategies given intraoperatively:

1. Intra operatively mean arterial pressure was maintained around 90mmhg, pCO₂ value maintained around 35 mmHg, normal oxygen saturation was maintained, blood glucose 100mg/dl maintained intra operatively. Hed was elevated to 30 degree to decrease intracranial tension and venous congestion 2. Thiopentone was used as an induction agent, inj mannitol-1g/kg I v given before cross clamp. Steroid (dexamethasone-8mg IV) given pre and intra operatively for cerebral protection.

Procedure:

Midline sternotomy was done, arch of aorta and common carotid artery id entified, aneurysm sac defined which was in the mid part of the common caro tid artery. Carotid stump pressure was measured using a transducer – (98/64 mmHg). Hence no shunt used for cerebral perfusion. Both ends of the aneurysm sac clamped during which inj heparin 5000 IU iv given. ACT value couldn't be assessed

due to lack of facility in our theatre. Cross clamp time was noted and it was only 4 minutes. inj.mannitol 50g(1g/kg) given before clamping. After the cross clamps no specific changes like facial puffiness was noted. Pupils were equally reacting to light. ABG samples were taken before and after cross clamp. Hemodynamic parameters were recorded.

Before	pH	Pco2	Po2	Hct	Na +	K +	HCO3	Cl-	PR	BP
clamp	7.35	34	402	35	123	3.4	24.8	86	76/min	132/72
After	7.3	32	409	35	124	3.5	24	88	78/min	145/80
clamp										

Intra operative neurological monitoring like BIS, SSEP, EEG, trans cranial Doppler were not available except carotid stump pressure. Sac opened, 300ml of blood clots removed from the sac. Mouth of the pseudo aneurysmal sac found out and pericardial patch closure done. Sternum closed with wires. Skin wound closed both in the chest and the neck. Bilateral ICD kept.



mouth of the sac after exploration



shunt used for distal perfusion

Summary:

Duration of surgery was around 4.5 hours and blood loss was around 1000ml which was replaced with 750ml of blood, 1 unit ffp, 1 unit platelet, and 3 litres of crystalloid solutions. Inj heparin 5000iv given during the procedure was reversed with inj. protamine 65 mg. Inj. tranexemic acid 1g iv and inj.dexamethasone 8mg given before sternotomy closure. urine output measured intraoperatively was 1200ml.

Post operative:

Patient was not reversed and not extubated and shifted to cardiothoracic post operative ward for post operative ventilation. patient put on controlled mode ventilation until the patient came out from the neuromuscular blockade, and then changed over to SIMV mode. Next day morning patient weaned off from the ventilator and extubated with out complications. Post operatively no neurological impairment noticed, and the patient remained stable. Post operative pain relief with inj.morphine- 0.1mg/kg i.v given

DISCUSSION

CAROTID ANEURYSM:

Aneurysm may arise from any artery. Carotid aneurysm is a least common type which may be true aneurysm or pseudo aneurysm. In pseudo aneurysm wall of the sac is formed by the adventitial layer. Causes of aneurysm are congenital, traumatic, degenerative or infective. carotid aneurysm may

present as asymptomatic neck swelling, or with neurological symptoms like TIA, amaurosis fugax, stroke or with obstructive symptoms like dyspnea, dysphagia. Development of the symptoms depend upon the age, comorbidities in the patient like coronary artery disease, hypertension, diabetes, degree of occlusion, collateral formation, integrity of circle of Willis.

Anaesthesia consideration during carotid artery surgery

Carotid surgeries pose a challenge to both surgeons and anaesthetists. Adding on to the difficult airway there are certain intra operative consideration in carotid surgeries. They are

1. Selecting the type of anaesthesia.
2. Maintaining the adequate cerebral perfusion.
3. Intra operative cerebral protection.
4. Rapid recovery from anaesthesia.
5. Adequate post operative pain relief.

Difficult air way:

The cardinal step in managing the difficult airway is identifying the difficult airway. One of the presenting symptoms of carotid pseudo aneurysm is a huge neck mass may compress the trachea and cause dyspnea, obstructive sleep apnea. As mentioned in the above case it is possible to compress the recurrent laryngeal nerve leading on to unilateral vocal cord palsy. Due to the huge neck swelling, neck movement will be restricted so difficulty in positioning during laryngoscopy was expected. Extensive manipulation during the laryngoscopy may rupture the aneurysm. Extreme extension during positioning for surgery may occlude the vertebral artery and jugular vein causing post operative neurological deficit and venous congestion.

Type of anaesthesia

There are many choice of anaesthesia for carotid artery surgery. It may be done under general anaesthesia, local anaesthesia or regional anaesthesia. In the above mentioned case, regional anaesthesia is ruled out as the proximal end of the sac is near the origin of the common carotid artery of which exploration needs thoracotomy for which general anaesthesia is essential. In general anaesthesia it is possible to achieve good airway control with less intra operative hypertension in contrast to regional anaesthesia and surgeon will be very comfortable with an immobilized patient. Most of the anaesthetic agents used in general anaesthesia are neuro protective but the main disadvantage in general anaesthesia is the difficulty to assess the neurological status intraoperatively and handling the difficult airway. In regional anaesthesia it is possible to assess the neurological status intraoperatively with excellent postoperative analgesia.

Intra operative neurological assesment:

Carotid artery surgeries are delicate surgeries in which it is very important to maintain the cerebral perfusion so closed monitoring of the cerebral perfusion is very important. There is possibility of reduced cerebral perfusion during cross clamping if the carotid stump pressure is not adequate and also there is possibility of injuring the normal carotid artery or dislodging clots during surgery which may lead to post operative neurological sequelae like stroke. So it is vital to monitor the functional integrity of the brain.

CLINICAL ASSESSEMENT

It is possible only in patient with regional anaesthesia or local anaesthesia in awake patient. Examinations which can be done are motor, verbal, conscious, sensory assessment, pupillary reaction

NEUROLOGICAL ASSESSEMENT

1. ASSESSEMENT OF CEREBRAL BLOOD FLOW:

1. Internal carotid artery stump pressure - <40mmhg-need shunt during surgery
2. Xenon 133 wash out test – detect regional cerebral blood flow
3. Trans cranial Doppler-detect middle cerebral artery flow velocity

2. CEREBRAL ELECTRICAL ACTIVITY:

EEG, SSEP

3. CEREBRAL OXYGENATION:

Cerebral oximeter,
Jugular venous oximeter.

INTRAOPERATIVE CEREBRAL PROTECTION MEASURES

They include both pharmacological and non pharmacological methods.

Non pharmacological method:

It include maintaining the normal mean arterial pressure during surgery around 90mmhg so that cerebral perfusion is adequately maintained. Since hyper carbia would increase intracranial tension hence normocarbica is maintained. Hypoglycemia will cause (nutritional deprivation and neuron death) and hyperglycemia (lactate accumulation resulting in intra cellular acidosis) which will be detrimental to the patients. so blood glucose is maintained around 120 mg/dl .To improve the oxygen delivery hematocrit is maintained approximately around 30-35%. Most important in the cerebral protection is hypothermia with temperature 32-34 degree Celsius in which there will be decrease in cerebral metabolism. For every 1 degree decrease in body temperature there will be 7% decrease in cerebral metabolic rate. 30 degree head up position which improve the venous drainage, decrease intracranial tension.

Pharmacological measures:

By decreasing the cerebral metabolic rate barbiturates provides excellent cerebral protection. But there are two main problems with that dose. Delayed recovery from anaesthesia and falling mean arterial BP. Dose is 5-10 mg/kg loading dose followed by 3-5 mg/kg/hr infusion offer good cerebral protection. Propofol offer protection by decreasing CMRO₂, free radical scavenging effect, anti oxidant properties. Steroids offer cerebral protection by free radical scavenging property and reduce cerebral edema. It is beneficial only if it started early with in 8hr of injury and continued for 48 hrs duration. Osmotic diuretics like mannitol and hypertonic saline gives protection in injured brain by decreasing intracranial tension, promote absorption of CSF. Magnesium offer protection by blocking the NMDA receptor. It also dilates the cerebral blood vessel and improves the cerebral perfusion. The proposed mechanism for calcium channel blocker to give neuro protection by cerebral vasodilatation, prevent vasospasm by reducing intra cellular calcium.

CONCLUSION

Carotid aneurysm surgery is a real challenge for both surgeon and anaesthetist. However proper preoperative optimization, intraoperative neurological monitoring implementing the neuro protection strategy and post operative care offer neurologically intact patient post operatively.

References

N. Pal, S.N. Das, U. Kiran, A. Bhan: Anaesthetic Implications And Management Of Carotid Artery Pseudoaneurysm In A Child. *The Internet Journal of Anesthesiology*. 2007 Volume 12 Number

1. DOI: 10.5580/826

2. subendothelial carotid hematoma after facioscopy of the thyroid gland Athanasios Anastasilakis, MD, PhD, Soulini 4, 566 25 Sykies, Greece

3. Dong - i k k i m , s e - h o h u h , y o u n g s o o d o , s u n g w u k s h i n , j h i n h y u n j o h s u r g i c a l e x p e r i e n c e i n c a r o t i d p s e u d o a n e u r y s m , d e p t o f v a s c u l a r s u r g e r y , S a m s u n g m e d i c a l c e n t e r , s u n g k y u n k w a n u n i v e r s i t y , s c h o o l o f m e d i c i n e s e o u l , k o r e a

4. stenting for carotid artery injury. Department of Vascular Surgery, The Cleveland Clinic Lerner School of Medicine, Cleveland, OH., 2 Pontificia Universidad Catolica, Santiago, Chile. Correspondence to: Leopoldo Marine, MD, Department of Vascular Surgery, Pontificia Universidad Catolica, Apoquindo 3990, Apartment 601, Las Condes, 7550112

Santiago, Chile; 5.the Difficult Airway in Head and Neck Tumor Surgery Niels F. Jensen, MD.Jonathan L. Benumof, MD1.Assistant Professor, Department of Anesthesiology, University of Iowa2.Professor, Department of Anesthesiology, University of California at San Diego

6 Causes for unilateral vocal cord palsy Jayanthi-pavithran,jayakumarmenon 7 .imaging of cystic neck masses A.T. Ahuja, Department of Diagnostic Radiology & Organ Imaging, Chinese University of HongKong, Prince of Wales Hospital, 30-32 Ngan Shing Street, ShatinN.T., Hong Kong. Tel.: þ852 2632 1180; fax: þ852 2648 7269.

8.extracranial internal carotid artery aneurysm.Lukla Biasi, Matteo Azzarone, Alessandro De Troia, Pierfranco Salcuni,Tiziano TecchioUnit of Vascular Surgery, Department of Surgical Sciences, University of Parma, Parma, Italy

9.MILLER text book of anaesthesia 7th edition

