



## ANAESTHETIC MANAGEMENT FOR AWAKE CRANIOTOMY IN A PATIENT HAVING BRAIN ABSCESS AND CYANOTIC CONGENITAL HEART DISEASE (TRUNCUS ARTERIOSUS)

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**ABSTRACT** Cyanotic congenital heart disease such as truncus arteriosus is associated with unique hemodynamic pattern that affect delivery of oxygenated blood to the body. Truncus arteriosus is a rare cyanotic heart disease, characterized by one large vessel originates from heart that gives rise to both aorta and pulmonary artery. This result in the delivery of mixed oxygenated and deoxygenated blood to the various organs of the body. Awake craniotomy is type of brain surgery in which patient is remains awake and is able to communicate with operative team. This case report describes anaesthetic management of awake craniotomy in patient with brain abscess having cyanotic congenital heart disease specifically truncus arteriosus.

**KEYWORDS :** Cyanotic Congenital Heart Disease, Truncus Arteriosus, Awake Craniotomy, Brain Abscess

### INTRODUCTION

Truncus arteriosus is a rare cyanotic heart disease, have single large vessel originating from heart that gives rise to both aorta and pulmonary artery. This result in the mixing of the oxygenated and deoxygenated blood. Perioperative management of such patient with cyanotic congenital heart disease undergoing non cardiac surgery poses a challenge for noncardiac-anaesthesiologists. Thus, formulating plan of preoperative evaluation, optimization, intraoperative anaesthetic technique and appropriate drug choice was made according patient's cardiac condition to maintain stable hemodynamic and provide optimal oxygenation and better postoperative outcome. Here we describe anaesthetic management in case of brain abscess in patient having cyanotic congenital heart disease specifically truncus arteriosus, managed by awake right parietal craniotomy for drainage of brain abscess to avoid hazard of general anaesthesia to such patient.

### Case Report

A 25 year old male, 40 kgs weight was presented with complaint of left sided upper limb and lower limb weakness for 2 days, associated with history of convulsion(focal seizure) 15 days ago, associated with headache, easy fatigability, decreased appetite. The Patient was diagnosed as cerebral abscess with secondary polycythemia in known case of cyanotic congenital heart disease- truncus arteriosus. The Patient was diagnosed radiologically with extrapulmonary tuberculosis in form of cerebral tuberculoma. Anti-Koch's treatment was initiated accordingly. And for same Tab.Aspirine(150mg), Tab.Atorvastatin(40mg), Inj Dexamethasone(8 mg), inj. Leveticetam(500mg), antibiotic and other supportive medication was initiated.

On examination patient is conscious and oriented to time place and person.

### CNS Examination:-

GCS- 15/15

Bilateral pupils reactive to light

Motor:- Power- 0/5 on left side, 5/5 on right side

Tone- decreased on left side, normal on right side

Deep tendon reflexes- absent on left side, present on right side.

Sensory- no abnormality detected.

His preoperative investigation suggestive of Hb- 20.5 gm/dl, wbc- 19100/mm<sup>3</sup>, platelets-145000/mm<sup>3</sup> and other haematological investigation are within normal limits. ECG suggestive of ST segment depression in V1-V4, RBBB with strain.

Preoperative 2D Echocardiography revealed EF- 60%, Situs solitus, Persistent Truncus Arteriosus type C, Sub valvular shunt, Rudimentary Aortic and tricuspid valve.

CT Brain findings revealed- cerebral abscess in right parietal lobe, ? Tuberculoma, with mass effect in form of midline shift of 7 mm towards left side.

Patient's Pre operative vitals were Pulse- 56/min, regularly regular, BP- 110/70mmHg, SpO<sub>2</sub>- 83-85% on room air.

Anesthetic plan for awake craniotomy under sedation and scalp block was made for this patient. The procedure and associated risk was explained to patient and his relatives and informed written consent was taken.

Patient was shifted to OT, all standard monitors attached for heart rate, ECG monitoring, SpO<sub>2</sub> monitoring and vitals recorded, Prophylactic oxygen therapy with 4 lit/min O<sub>2</sub> via nasal prongs was started. Inj Ondansetron 3.2mg, Inj. Glycopyrolate 0.16 mg, Inj. Midazolam 0.8 mg, Inj. Fentanyl 40 mcg, intravenously were given. maintenance of sedation is provided by Dexmedetomidine infusion (0.5-1 mcg/kg/hour, titrated according to vital parameters).

The Patient's head was positioned and scalp block administered under aseptic precautions using Inj. Ropivacaine(0.25%) to block the following nerves.

- 1) Supraorbital nerve:- supraorbital notch was palpated, Inj. Ropivacaine (0.25%) 2 ml injected above the supraorbital notch.
- 2) Supratrochlear nerve:- Inj. Ropivacaine (0.25%) 2 ml injected just medial to supraorbital nerve injection site, at superior medial corner of orbit
- 3) Zygomaticotemporal nerve:- Inj. Ropivacaine (0.25%) 2 ml injected at joining point of lateral aspect of superior orbital ridge and distal aspect of zygomatic arch infiltrating deep to temporalis fascia.
- 4) Auriculotemporal nerve:- Inj. Ropivacaine(0.25%) 2 ml injected just 1.5 cm anterior to ear at the level of tragus ( superficial temporal artery palpated and avoided intra-arterial injection).
- 5) Greater occipital nerve:- Inj. Ropivacaine(0.25%) 2 ml injected at midway between occipital protuberance and mastoid process, 2.5 cm lateral to superior nuchal line- medial to occipital artery.
- 6) Lesser occipital nerve:- Inj. Ropivacaine(0.25%) 2 ml injected at midway between occipital protuberance and mastoid process, 2.5 cm lateral to greater occipital nerve along superior nuchal line.

Throughout intraoperative period patient was remain awake, vitally stable and able to respond to verbal stimulation and answer our question.

The surgery lasted for 80 minutes and remained uneventful. After completion of surgery patient was shifted to Surgical ICU for vital monitoring, patient was kept on HFNC support for 12 hours and maintaining SpO<sub>2</sub>- 88% on 14 lit/min oxygen, FiO<sub>2</sub>- 50% via HFNC. After 12 hours of oxygen therapy patient was maintaining SpO<sub>2</sub>- 83% on room air with other vitals remain within normal limits.

Patient was hemodynamically and neurologically stable for 24 hours after surgery, then shifted to ward for further management and was discharged from hospital after 10 days after surgery

### DISCUSSION

Due to the single arterial trunk originates from heart, these patient are

highly sensitive to changes in systemic vascular resistance(SVR) and pulmonary vascular resistance(PVR). Patient with Truncus arteriosus are at susceptible to development of hypoxia, cyanosis and hemodynamic instability particularly during period of physiological stress. General anaesthesia and positive pressure ventilation can lead to increase in pulmonary vascular resistance, potentially worsening of right to left shunting and hypoxia in patient with truncus arteriosus. Whereas Awake craniotomy preserves negative intrathoracic pressure, aiding venous return and pulmonary blood flow

Management for awake craniotomy in such case include proper preoperative planning, to avoid fluctuation in pulmonary and systemic vascular resistance, maintenance of spontaneous ventilation and stable oxygenation, along with judicious titration of sedation, continuous hemodynamic monitoring and measures to maintain normal cerebral perfusion while preventing rises in intracranial pressure are also critical. With these strategies, awake craniotomy can be safely performed in patient with truncus arteriosus, thereby avoiding potential risk associated with general anaesthesia which may affect cardiac hemodynamic pattern in patient with truncus arteriosus.

## CONCLUSION

This case demonstrate that awake craniotomy can be safely performed in patient with truncus arteriosus where proper preoperative planning for anaesthetic management, titration of sedation, hemodynamic monitoring and stability, maintenance of spontaneous ventilation are essential to optimize neurological outcome in patient having cyanotic congenital heart disease.

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