

# Anaesthetic Challenge of Craniopagus Twin: A Case Report

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### Abstract:

*We describe the anaesthetic management of 2 years old Craniopagus twins for cerebral angiogram & embolization. Anesthetic management for Craniopagus twins is associated with unique concerns of cross circulation, difficulty in mask ventilation, difficult access to airway and intubation due to angle between the heads. Adequate preparation and teamwork is the keystone to the management of these patients.*

**Key words:** Conjoined twin, Craniopagus, difficult airway.

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### Introduction

The successful operative separation of conjoined twins requires detailed preoperative assessment, multidisciplinary team planning & intensive anesthetic management. Conjoined twins are babies joined together in utero. They result from an aberrant twinning process with incomplete fission of zygotes primitive streak at 20 days of ovulation. Incidence of this anomaly has been estimated to be 1:25000 to 1:100000 births, with approximately 60% stillborn and a smaller fraction of pairs born alive have abnormalities incompatible with life<sup>1</sup>. An increased incidence has been noticed, ranging from 1:14000 to 1:25000 in some Asian countries, eg- India, Pakistan, and Thailand as well as in Africa especially East Africa, Nigeria and south Africa<sup>2-3</sup>. The overall survival rate for conjoined twins 25%. It is infrequently found in females with a ratio of 3:1. Conjoined twins are classified by the point of union: Thoraco-omphalopagus (32%), thoracopagus (19%), Omphalopagus (10%), Parasitic twins (7%), and Craniopagus (3%)<sup>4</sup>. Craniopagus babies can be joined at the back of the head, front of the head and at the side of the head. Their skulls are fused but bodies are separate.

### Case Report

Anesthesia and sedation may be required for a variety of surgical or investigative procedures in conjoined twins. Diagnostic investigations that are often required include CT scan, MRI, Cardiac catheterization, Echocardiography, various endoscopic procedures, and many plain radiological studies



Fig 1 Craniopagus Twin (Rabeya, Rokeya)

Prior to separation, operations for a variety of pathological problems may be necessary. In our experience of this pair of babies there are 3 steps prior to separation. Initially cerebral angiogram and embolization of superior sagittal sinus was

done on 28/02/2018 and embolization of Transverse sinus was done on 19/08/2018 at Cath Lab of Dhaka Medical College Hospital. Next step will be insertion of tissue expander and after adequate tissue expansion separation will be done after 4 to 5 months later.

We describe the Anesthetic and airway management for cerebral angiogram and embolization of superior sagittal sinus and transverse sinus.

A 23 months old twin baby (Rabeya & Rokeya) got admitted to the department of Burn and plastic surgery unit of Dhaka Medical College Hospital with the complaints of fusion of head of the two babies since birth. They were born in Pabna district of Bangladesh by ceaserian section. Except head all other parts of their body were separated and normal. Their all investigations (CBC, CXR, S.Albumin, Bleeding profile, S.creatinine,USG of whole abdomen, CTscann of Brain, Echo-cardiography) were done .Finally they diagnosed as a case of Craniopagus with a common superior sagittal sinus and Transverse sinus by CTangiogram.Then they were prepared for cerebral angiogram followed by embolization of superior sagittal sinus and transverse sinus under general anesthesia for the development of co-lateral circulation.

#### **Pre operative assessment**

- Suspected difficult intubation as their heads attached at the posterolateral aspect of occiput and slight tracheal deviation due to muscle traction.
- All baseline investigations were within normal limit.
- They were immunized as per EPI schedule.
- No history of allergy to any food or drugs.

#### **Anesthetic planning**

- Ready two skilled anesthesia team for two baby.
- Prepare two trolley for management of difficult intubation.
- Prepare two anesthesia machine with monitor.
- Prepare two Pediatric ventilators with ICU support for post operative period.

#### **Anesthetic Management**

Two skilled anesthesia team were ready for giving anesthesia. Difficult intubation trolley was ready.

All procedure were done at Cath Lab of DMCH on a Single operating table.Their total weight were 26 kg, so drugs and fluid were calculated as 13kg for each baby separately. Before induction cross circulation was ruled out by giving anticholinergic to baby Rabeya with no significant change in the heart rate of Rokeya. Inhalation induction was done first,then two separate intravenous canula of 24G were inserted.After inhalational induction and insertion of IV canula, intubation was done one after another with.inj. Fentanyl ; inj. Propofol and inj. Suxamethonium. Intubation was slight difficult for one baby (Rokeya) first time, but second time intubation was more difficult because they are growing and the angle between two heads became more acute. ETT size was 3.5 .Intravenous fluid was started as per protocol in two separate micro burette.

Then anesthesia was maintained by Oxygen, Nitrous oxide, Hallothane, inj.Fentanyl and inj. Atracurium. We monitor pulse, blood pressure (NIBP), Temperature,SpO2,ETCO2 and urine output during the procedure. It took 3 hours at first day and 3.5 hours at second day anesthesia for cerebral angiogram and embolization. After the procedure reversal from anesthesia was done smoothly with Neostigmine and Atropine. Adequate fluid was maintained in the post-operative period as per protocol. Any alteration in change of position of their head make them irritable, so adequate analgesia and sedation was maintained with inj.Acetaminophane and inj.Pethedine as per schedule. Two ventilators with all ICU monitor system were ready for any emergency but there were no need for ICU support. After over night monitoring in the post operative period they were shifted in the cabin next morning.

#### **Discussion**

The first case of surgical seperation of conjoined xiphopagus twins was reported in 945AD from Constantinople,where one of the twins died and the other survived for 3days<sup>5</sup>.The first successful separation of xiphopagus twins was performed by Konig in 1689.The separation was by tightening and necrosing the band of tissue between the twins. The first successful seperation of thoracopagus twins.with at least one twin surviving, was performed in1900,for Pyopagus

twins in 1912 and for Craniopagus twins in 1952. In 1966, the first separation of ischiopagus tetrapagus twins, in which both twins survived, was reported. Anesthetic management for separation of conjoined twins was first published by Hall et al, from Maryland in 1957<sup>6</sup>. During induction of Anesthesia, induction agents and muscle relaxants given to one twin may pass to the other and may result in sedation, airway obstruction, hypoventilation or apnea in other twin. Anesthesia should be induced after it is known that both twins can be mask-ventilated<sup>7</sup>. In our case twins undergone cerebral angiogram with embolization of superior sagittal sinus as an early step of separation. Next step will be insertion of tissue expander and after adequate tissue expansion separation will be done.

#### **Conclusion:**

It is concluded that giving anesthesia of Craniopagus twin present a big challenge to the anesthetist. Mainly pediatric anesthetists are well prepared for managing this type of situation. Our principal concern were difficult intubation and calculation of drugs and fluid as there were chance of cross circulation. Presence of two anesthesia team of 4 members, neurosurgery team, vascular surgery team, circulating nurses, machines, monitors all together in one room were also a problem. Even then we finally prepared the

craniopagus twin for insertion of tissue expander and finally separation.

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