



Anaesthetic Management of Separation of Omphalopagus Conjoined Twins: A Case Report

Ankita Sharma,¹ Harish Kumar,¹ Ashutosh Kaushal¹

Abstract

Conjoined twins are a rare congenital anomaly. The extent of organ sharing and cross circulation between twins determine the possibility and prognosis of a separation procedure. In this case anaesthetic management for successful separation of omphalopagus conjoined twins at day three of life is presented. Authors emphasise the importance of an integrated approach, thorough preoperative evaluation and planning, vigilant intraoperative monitoring and anticipation and management of complications like hypothermia, hypotension, hypokalaemia, hypocalcaemia and postoperative concerns and care.

Key words: Anaesthesia; Conjoined twins; Omphalopagus.

1. All India Institute of Medical Sciences, Bhopal, India.

Correspondence:
HARISH KUMAR
E: harish.anesth@aiimsbhopal.edu.in

ARTICLE INFO

Received: 7 May 2023
Revision received: 16 July 2023
Accepted: 16 July 2023

Introduction

Conjoined twins are suggested to result from aberrant embryogenesis. The incidence rate is 1:50,000 to 1:2,000,000 live births; with a higher incidence of 1:14,000 to 1:25,000 experienced in Africa and Asia.^{1,2} Conjoined twins are classified based on their site of attachment. Omphalopagus twins are conjoined twins sharing part of gastrointestinal system and abdominal wall. The extent of organ sharing and cross circulation between twins determine the possibility and prognosis of a separation procedure. It presents anaesthesiologists with unique challenges in preoperative preparedness, intraoperative monitoring and management and postoperative care.² A case of anaesthetic management of separation of omphalopagus conjoined twins at day 3 of life is reported. Consent was taken from the parents.

Case History

A 3 day female omphalopagus conjoined twins were referred to our institute for separation as there was damage to the connecting bridge at the time of delivery by lower segment caesarean section (LSCS). The twins were crying, alert, active and joined ventrally from anterior abdominal wall (Figure 1). The combined weight of twins was 3.2 kg. During preoperative evaluation, both babies were evaluated for the extent of organ sharing, presence of any cross circulation and any other gross congenital anomaly. Investigations included routine blood investigations, arterial blood gas analysis (ABG), baby gram and echocardiogram. Haemoglobin (Hb) in both the babies were 8.4 and 8.7 g/dL, respectively. All other analyses were within normal range. Other congenital anomalies like cardiac anomalies, limb etc were excluded.



Figure 1: Preoperative babygram showing omphalopagus

The case was discussed with paediatrics surgeons and neonatologists. Two separate teams were formed with two anaesthesiologists in each team, two workstations and two set of anaesthetic drugs and equipment and emergency drugs. Twins were labelled as T1 and T2. Workstation, monitoring lines and intravenous (iv) set were also labelled as 1 and 2. Blood grouping and cross matching was done for each twin and blood and blood products were kept ready in operating room (OR). Two intravenous cannula 24G each were secured in each twin. Central venous catheter could not be inserted due to complexity in positioning. OR was prewarmed, patients were shifted and all monitors were attached. The presence of cross-circulation was ruled out as there was no increase in heart rate of second twin with atropine premedication of first twin.

Both babies were preoxygenated and premedicated with atropine. Inhalational induction was done with sevoflurane and atracurium to both babies. Bag and mask ventilation was done in both twins. Direct laryngoscopy was done and airway was secured with 2.5 mm uncuffed endotracheal tube in T1 after placing T2 over T1. Endotracheal tube fixed after checking bilateral air entry. Same process was repeated for T2. Maintenance of anaesthesia was done with sevoflurane,



Figure 2: Twins after separation

fentanyl and atracurium. ABG, electrolytes, blood glucose and urine output were noted hourly. Iv fluid 5 % dextrose with 0.45 % saline was used for maintenance and *Isolyte-P* was used for third space losses. Intraoperatively, there was acidosis with pH 7.12 and 7.14 in T1 and T2, respectively which was corrected by iv sodium bicarbonate, anaemia with Hb 6.0 and 6.2 gm/dL, respectively was corrected by blood transfusion and hyperkalaemia 5.8 and 6.0 meq/L which was managed by iv calcium gluconate and insulin infusion. The surgery lasted for three and half hours. The first baby received 50 mL (including 20 mL red blood cells (PRBC) + 30 ml fluid) and second baby received 60 mL (including 30 ml PRBC and 30 ml fluid). Urine output was 5 mL and 6 mL, respectively.

After successful separation, exploratory laparotomy was performed in each baby simultaneously by two surgery teams (Figure 2). At the end of surgery, both babies were shifted to neonatal intensive care unit (NICU) for further management and put on elective mechanical ventilation and were extubated on second postoperative day. Paracetamol suppository was given for postoperative pain. They were discharged healthy after a month.

Discussion

The separation surgery of conjoined twins require integrated approach with proper preoperative evaluation, vigilant intraoperative monitoring and appropriate management and care in intraoperative and postoperative period.^{3, 4} Conjoined twins are classified depending on the site of union of their body parts as thoracopagus (40 %) - thorax, omphalopagus (33 %) - lower abdomen, pyopagus (19 %) - sacrum, ischiopagus (6 %) - pelvis, parapagus (5 %) - lateral union of lower half or craniopagus (2 %) - skull. Each type of conjoined twins are different and have problems unique to their organ sharing. Omphalopagus have gastrointestinal tract sharing with or without involvement of intraabdominal organs.^{5, 6}

Rehearsal in OR should be done beforehand assigning different roles to different member of the team. Rehearsal could not be done in presented case as it was emergency surgery so only assigning of roles was done. Double supply of OR table, anaesthesia workstations, infusion pumps, fluid warmers, airway and other equipment's, anaesthesia and emergency drugs is necessary. Numbering or colour coding should be done to prevent mistakes. Drug doses should be calculated based on the weight of each individual twin rather than on the combined weight.

Complications which may arise during surgery should be anticipated beforehand. These include position of twins before, during and after surgery, blood loss which is difficult to assess in individual twin, prolonged surgery, considering one patient as two patients, calculation of drugs, fluid, blood and number of persons involved in OR. Fluid balance should be kept slightly positive as it is difficult to assess loss in each individual and due to increased loss from exposed gut in prolonged surgery. Careful monitoring should be done including vitals, ABG, haematocrit, electrolytes, random blood sugar (RBS) and temperature. Induction of anaesthesia should depend on several factors like presence of intravenous access, difficulty in airway due to difficult positioning or presence of associated anomalies, haemodynamic stability and preference of anaesthesiologist.⁷ The presence of cross circulation place an important role. It is confirmed by observing heart rate changes in second twin with atropine premedication of first twin, by observing BIS of

second twin on inducing 1st twin and by using various isotope and contrast studies.^{8, 9} There is increased risk of hypothermia, so warm blanket, forced air warmer, warm fluid and blood, ambient OR temperature and warming OR lights should be used.¹⁰ Survival of these patients depend on the extent of organ sharing, presence of cross circulation and presence of associated anomalies. Post operative care, ventilatory management and pain management also play an important role.

Acknowledgements

None.

Conflict of interest

None.

References

- Hansen J. Incidence of conjoined twins. *Lancet* 1975;306:1257. doi: 10.1016/s0140-6736(75)92092-9.
- Deepak C, Vandana S, Pradeep B, Nikhil K. Anesthetic management of separation of conjoint twins: Challenges and limitations. *Saudi J Anaesth* 2019;13:140-3.
- Chalam KS. Anaesthetic management of conjoined twins' separation surgery. *Indian J Anaesth* 2009;53(3):294-301.
- Spitz L, Kiely EM. Experience in the management of conjoined twins. *Br J Surg* 2002;89(9):1188-92.
- Lalwani J, Dubey K P, Shah P. Anaesthesia for the separation of conjoined twins. *Indian J Anaesth* 2011;55:177-80.
- Kaniyil S, Pavithran P, Mubarak KK, Mohamed T. Anaesthetic challenges in conjoined twins' separation surgery. *Indian J Anaesth* 2016;60:852-5.
- Zhong HJ, Li H, Du ZY, Huan H, Yang TD, Qi YY. Anesthetic management of conjoined twins undergoing one-stage surgical separation: A single center experience. *Pak J Med Sci* 2013;29(2):509-13.
- Greenberg M, Frankville DD, Hilfiker M. Separation of omphalopagus conjoined twins using combined caudal epidural-general anesthesia. *Can J Anaesth* 2001 May;48(5):478-82. doi: 10.1007/BF03028313. Erratum in: *Can J Anaesth* 2001 Oct;48(9):931. doi:10.1007/BF03028313.
- Oak S N, Joshi R M, Parelkar S, Bhat U, Satish Kumar K V. Successful separation of Xipho-Omphalopagus twins. *J Indian Assoc Pediatr Surg* 2007;12:218-20.
- Kobylarz K. Anaesthesia of conjoined twins. *Anaesthesiol Intensive Ther* 2014;46(2):124-9.