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CORRESPONDENCE PEDIATRIC ANESTHESIA

Low-cost simulation technique in planning and preparing perioperative team for conjoined twins separation surgery

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Summary: The authors present a low-cost simulation technique to discuss the airway management, the surgical technique, the problems to be faced by the anesthesia and the operating teams, and how to proceed with the operative surgery to separate the conjoined twins.

Key words: Conjoined twins; Simulation

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Conjoined twins are an extremely rare congenital malformations in humans but also one of the most difficult one to treat.[1] The incidence is estimated to be 1 in 50,000 to 1 in 100,000 births.[2] It is about three times more frequent in girls and is higher in Africa and Southwest Asia.[2] Separation surgery is an enormous challenge and requires detailed planning. A multidisciplinary team approach needed involving extensive medical work-up, multiple meetings and discussions with all the involved specialties and supporting staff.

Rehearsal is the act of practicing an activity before its actual occurrence. A simulation-based clinical rehearsal (SbCR) refers to enactment by clinicians for a procedure prior to actual patient care.[3] They provide a distinctive opportunity to prepare for complex, rare and patient specific clinical scenarios. Simulation can be used prior to surgery to identify space requirements for teams involved. It can also orient about positioning of anaesthetic equipment, ventilators and monitors and determine requirements for optimal patient positioning. In modern digital world, a wide range of simulation techniques have been used such as virtual reality, 3-D printing and robotic simulators. These are not usually available in resource limited settings. Here we describe our technique of developing simulated conjoined twin babies and conduct of a rehearsal session preoperatively. Eight months and twelve days old thoraco-omphalopagus conjoined twin boys were referred to our hospital for evaluation and surgical separation. The twins were fused ventrally at manubrium, along the mid-sternal line up to umbilicus and facing each other at an

Figure 1A: Twins conjoined at their sternums till the umbilicus facing each other

angle of approximately 45° (Figure 1A). After being investigated and completed all radiological imaging procedures, the separation surgery was planned. A day before, we conducted 1-hour full simulation session which consisted of a simulated manikin of the twins made by local material, joined each other in the same way as the boys have line of fusion (Figure 1B).

We labelled simulated twins as 'Red' and black in the same way we identified actual patients. First the anesthetic drill was performed by two separate teams with regards to color coding of all equipment, airway management, invasive monitoring, positioning and hemodynamic management. Then, surgical rehearsal includes extent of ventral and dorsal incisions, identification line of fusion, separation of bony

Figure 1B: Two dolls joined to simulate the conjoined twins

attachments, tissues and liver, closure with mesh and then transfer of one "twin" to another operating table using a sterile, draped transfer trolley. The anticipated problems like several changes of twins' positions on the operating table, hypothermia, blood loss and its estimation, and difficulty in chest closure were discussed. About fifty healthcare staff including four pediatric surgeons with their trainees, three anesthesiologist with two residents, pediatric intensive care physician, nurses, anaesthetic and operating room technicians attended the simulation session. Next day, the eight-hour surgical procedure together with anaesthetic management performed trouble-free. The steps and problems identified during simulation were dealt with appropriate solutions during the perioperative period dealt with appropriate solutions during the perioperative period.

The conjoined twin separation surgery is both extremely complex but also very fascinating.4 Through simulation, we learned how to prepare and accomplish the challenging steps in anaesthesia, surgical and nursing care. Simulation provides opportunity to grasp principles of teamwork like leadership, effective communication, shared goals and patience during extremes of situation.

Conflict of interest

None declared by the authors.

Authors contribution

All authors took part in the whole simulation project as well as in the anesthetic management of the twins.

References

1. Atteri M, Patino M, Aronson LA. Anesthesia for Conjoined Twins Basic Principles. In: Goudra BG, Singh PM, Green MS. (eds) Anaesthesia for Uncommon and Emerging Procedures. Springer, Cham; 2021.
2. Mutchinick OM, Luna-Muñoz L, Amar E, Bakker MK, Clementi M, Cocchi G et al. Conjoined twins: a worldwide collaborative epidemiological study of the International Clearinghouse for Birth Defects Surveillance and Research. Am J Med Genet C Semin Med Genet. 2011;157C:274-87. [PubMed] DOI: 10.1002/ajmg.c.30321
3. Arnold J, Cashin M, Olutoye OO. Simulation-based clinical rehearsals as a method for improving patient safety. JAMA Surg. 2018;153:1143–44. [PubMed] DOI: 10.1001/jamasurg.2018.3526
4. Mian A, Gabra NI, Sharma T, Topale N, Gielecki J, Tubbs RS, Loukas M. Conjoined twins: From conception to separation, a review. Clin Anat. 2017;30:385-396. [PubMed] DOI: 10.1002/ca.22839

