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Case Report

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Anaesthesia Management of Premature Conjoined Twins with Anal Atresia

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Abstract

Anaesthesia management of the conjoined twins poses some difficulties both for the anaesthesiologist and the twins. The airway management, presence of cross circulation, hypothermia and positioning are significant points during anaesthesia. We report the anaesthetic management during the colostomy opening of omphalopagus twins with anal atresia, and ultrasound-guided central venous catheterisation.

Keywords: Anaesthesia, catheters, colostomy, conjoined twins, premature, ultrasonography

Introduction

Conjoined twins have multiple congenital anomalies, as well as anatomic fusions; therefore, they also need various surgical procedures and invasive interventions beyond the separation process. We present the anaesthetic management during the colostomy opening in omphalopagus twins and ultrasound-guided (UG) central venous catheterisation (CVC).

Case Presentations

Case 1

Conjoined twins (both males) were delivered by an emergency caesarean section under general anaesthesia at 34 weeks of gestation. The twins, named as B1 and B2 (Figure 1), had a total weight of 3,620 grams. Ultrasonography revealed single rectum and one set of male genitalia. The transthoracic echocardiogram finding of B1 was normal; however, B2 had patent foramen ovale.

On day 6, the twins were taken into the operating room after written informed consent was obtained from parents. The anaesthesia of twins was performed by two teams. They were monitored with electrocardiogram, non-invasive blood pressure and peripheral oxygen saturation. For fluid resuscitation, 5% Dextrose-0.02% NaCl was initiated. Anaesthesia induction for B1 was provided with incremental concentrations of sevoflurane in 100% oxygen (O2). Simultaneously, the ventilation of B2 was provided with 2% sevoflurane. Firstly, B1 was intubated after rocuronium (0.6 mg kg^{-1}) administration, and then the intubation of B2 was attempted; however, he showed excessive movement during intubation. Therefore, rocuronium was also applied to B2, and intubation was successful. A size 2.5 uncuffed endotracheal tube was used, and pressure-controlled ventilation was preferred to adjust the end-tidal carbon dioxide values between 30 and 35 mmHg of both twins. The body temperatures were 35°C and 34.8°C, respectively, at the beginning of surgery. Anaesthesia was continued with 0.2%–1% sevoflurane in 50% nitrous oxide (N_2O)–O_2 mixture, and additional rocuronium was administered when needed. Cystoscopy and opening of colostomy were conducted. Haemodynamic and respiratory parameters were within normal physiologic limits during anaesthe-

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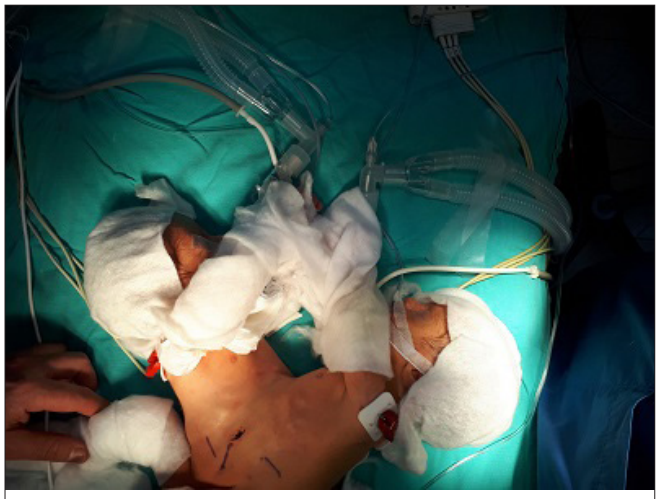

Figure 1. Conjoined twins after anaesthesia induction

sia. However, the twins experienced hypothermia despite the use of warm blankets. At the end of surgery, the body temperatures of the twins were 35.5°C and 35°C, respectively. Tramadol (1 mg kg^{-1}) was administered for postoperative analgesia. Duration of anaesthesia was 165 min. A neuromuscular block was antagonised with neostigmine (0.05 mg kg^{-1}) and atropine (0.015 mg kg^{-1}). However, extubation could not be performed because there was not enough spontaneous breathing effort of the twins, and they were transferred to the intensive care unit.

Case 2

Central venous catheterisation was performed on the same pair of twins 3.5 months after the initial surgery when their weight had reached 10,200 grams. The intravenous (IV) accesses applied by the paediatric surgeons and nurses was unsuccessful. Preoperative haemodynamic parameters in routine monitoring were consistent with twins' age. The anaesthesia of twins was performed by two teams. It was induced with incremental concentrations of sevoflurane and maintained with 2% sevoflurane. After obtaining an adequate anaesthesia depth, airway patency was provided through the Size 1 I-gel in B1. However, the I-gel placement was failed in B2, and airway management was provided by using a face mask. Spontaneous breathing was preserved. After anaesthesia induction, IV attempts were unsuccessful. The catheterisation of the internal jugular vein (IJV) was achieved through ultrasound guidance. The UG–CVC were performed using an out-of-plane technique (7.5–12 MHz linear assay probe, MyLab Five Esaote, Maastricht, the Netherlands) using a 20-gauge needle under sterile conditions. For B1, the right IJV catheter was inserted on the first attempt. The left IJV catheter was attempted without changing the position of B2, but no J tipped guide wire insertion was performed despite successful venipuncture. Therefore, placement was rotated for the right IJV catheterisation, which was performed successfully on the first attempt. After catheterisation, anaesthesia was terminated, and the twins were transferred from the operating room to the postoperative unit.

Discussion

Premature conjoined twins with anal atresia may have some problems in airway management, lung ventilation and positioning during surgery (1). In our literature search, we did not encounter any procedure before the surgical separation and UG–CVC insertion under general anaesthesia without an IV access.

In conjoined twins with face-to-face presentation, the risk of airway complications is a point that should not be ignored (2). We think that it will become more difficult to position for airway management as babies gain weight. It was also difficult to position the twins for surgery. We would like to mention that position changes require planning and maximum attention.

Anaesthetic agents used for one baby can adversely affect the other baby due to existing cross circulation. To determine the extent, indirect methods such as a sulphur colloid liver scan, glucoheptonate scan and computerised axial tomography may be used, but they are not definitive (3). An anticholinergic drug can also be administered before the anaesthesia induction, and the increase of HR in other twin can be interpreted in favour of cross circulation (1). However, we did not prefer these methods. Anaesthetic agents used in B1 did not suppress the spontaneous breathing of B2. For B2, intubation without a neuromuscular agent was attempted, but it failed. We encountered neither cross-anaesthesia nor cross-neuromuscular blockage. We experienced a further handicap regarding the dosage of the drugs because we did not know the actual weight of each baby, so it was hard to estimate it. Therefore, in a dose calculation, we considered half the total weight of both babies as the weight of each baby.

New-borns who have a high surface-area-to-the-body-weight ratio are at risk for hypothermia (4). Operating room temperature should be adjusted, and closure of the heads, warm blanket and heated fluids should be used during anaesthesia. Despite our attention to these factors, the twins experienced hypothermia, which may have been caused by prematurity, wetting during cystoscopy and the exposure of the bowel to ambient temperature for a prolonged period.

General anaesthesia without IV access is a risk because medications cannot be administered rapidly in emergency situations. In this case, some anaesthetic agents could be administered, intramuscularly. However, sevoflurane was preferred to avoid repeated doses of intramuscular anaesthetic agents. There were no problems encountered during anaesthesia.

A recent study reported that the use of ultrasound during CVC is superior compared to the landmark technique in terms of the first attempt success rate, number of puncture attempts and complications (5). In this context, no problems occurred during UG–CVC except with regard to the position of the twins.

Conclusion

The airway management, prevention of hypothermia and positioning during anaesthesia and surgery are steps that should receive the utmost attention in anaesthetic management of conjoined twins.

Informed Consent: Written informed consent was obtained from the parents of the patients who participated in this case.

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