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Reported cardiovascular events during laparoscopy in term and preterm neonates

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Laparoscopy is progressively performed in pediatric surgery. Cardiac anomalies are supposed to be a contraindication to minimally invasive surgery, but until today there are no general recommendations. A few retrospective studies have reported promising results, but reports on intraoperative complications are scarce, especially in infants and neonates. The aim of this study was to review the literature for reported cardiovascular events during laparoscopy in neonates. Therefore, a systematic review of the literature using Pubmed, Medline and Science Direct was performed. Altogether, four single case reports presenting neonates who developed cardiovascular events during a laparoscopic procedure were identified. Two neonates were supposed to undergo laparoscopic pyloromyotomy and two laparoscopic repair of duodenal atresia. During the laparoscopic procedure three neonates developed a cardiac arrest and required CPR. One neonate presented bradycardia, hypotension and decrease of oxygen saturation a few minutes after creation of a capnoperitoneum. In all cases gas embolism through a patent umbilical vein was assumed to be responsible for the cardiovascular events during laparoscopy. Post- or intraoperative echocardiography revealed persistent fetal circulation in three of four neonates. All neonates were successfully resuscitated and did not present neurological or cardiopulmonary sequelae.

In summary, gas (carbon dioxide or air) embolism is a rare but serious complication of laparoscopic surgery in neonates. Presence of an open umbilical vein and persistent fetal circulation are the most important risk factors. In case of surgical injury of the umbilical vein during open or closed placement of the trocar the risk of gas embolism has to be respected.

Biography

Christine Burgmeier is a surgeon in training in the Department of General, Visceral and Pediatric Surgery at the University Medical Center Ulm, Germany. She completed her studies at the Ludwigs-Maximilians-University (LMU) Munich, Germany in 2006. Then she started her surgical training in Cardiothoracic and Vascular surgery, before she specialized in Pediatric Surgery in 2010. Her main research interest is minimal invasive surgery in term and preterm infants with cardiac anomalies.

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