

# Local vasoconstriction following ropivacaine/dexmedetomidine parasternal block in a neonate

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## 1 | VASOCONSTRICTIVE SIDE EFFECT OF ROPIVACAINE IN A NEONATE

This 3100g neonate (born at 40th weeks/+1day of gestation) with hypoplastic right heart syndrome (tricuspid/pulmonary atresia, atrioventricular septum defect, persistent ductus arteriosus) underwent ultrasound-guided parasternal pectointercostal chest wall block on day five postpartum with 1.8mL of ropivacaine 0.375% and 4 mcg of dexmedetomidine distributed over four injection sites prior to palliation with an aortopulmonary shunt. [Figure 1](#) shows the neonate on the first postoperative day. An allergic reaction to local anaesthetics was initially suspected by the ward physicians, but the partially tricolour appearance with pale skin in the center of the hyperaemic rings around the injection sites (additional livid center in the right upper lesion) did not fit this diagnosis. An allergic reaction would likely result in a local hyperaemic area around the injection sites or a systemic reaction. The pallor and discrete central cyanotic zone in some of the efflorescences fit more with the concept of a local vasoconstrictive drug effect. A literature search suggested that the clinical picture may be a direct vasoconstrictor effect of ropivacaine, consistent with the report by Kopacz and colleagues in an animal study. In this study ropivacaine decreased blood flow by approximately 50%, whereas bupivacaine increased blood flow by approximately 90%.<sup>1</sup> Similarly, a study by Cederholm and colleagues found a reduction in skin blood flow in healthy participants after intradermal injection of ropivacaine.<sup>2</sup> The addition of dexmedetomidine to a local anaesthetic is known to enhance the analgesic effect; however, dexmedetomidine has vasoconstrictive properties as well, which aids to prolong the action of the local anaesthetic.<sup>3,4</sup> Thus, the action of dexmedetomidine may have contributed to the vasoconstrictive effect of ropivacaine. In our



**FIGURE 1** Appearance of the newborn shortly after cardiac surgery after transfer from the operating table to the bed. Impressive is the tricolour appearance of the skin lesions with hyperaemic rings around the injection sites of the local anaesthetics. The skin florescences disappeared spontaneously during the first postoperative day.

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routine practice with the application of parasternal blocks in adults, consisting of ropivacaine + dexmedetomidine, such skin lesions have never been observed, nor have they been seen with the use of bupivacaine instead of ropivacaine. Based on these findings, we advocate the use of bupivacaine (0.25%, max. 1 mL/kg) instead of ropivacaine for chest wall blocks, especially in neonates.

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#### CONFLICT OF INTEREST STATEMENT

The authors declare no competing interests.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

#### CONSENT

We received consent from the parents of the child to publish this information and the image.

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