

Beneficial effect of epidural analgesia for relief of ischemic limb pain in an infant

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Introduction

In adults with lower limb ischemia, the primary benefit of sympathetic blockade is pain relief but may improve collateral blood flow and facilitate healing of skin ulcers.(1) No such data exist in children. We report the use of extended epidural analgesia to manage intractable ischemic pain in an infant with vascular thrombosis.

Case report

A 2-month (2.5kg) infant, born at 32 weeks gestation with history of intraventricular hemorrhage, respiratory distress, apnea and bradycardia of prematurity, was scheduled for balloon dilation of a critical pulmonary stenosis via femoral vein cardiac catheterization. The procedure was complicated by myocardial contusion and cardiopulmonary arrest. Following successful resuscitation the infant developed thrombosis of both the femoral artery and vein on side of catheterization, compromised IVC blood flow and required 72 hours of cardiopulmonary support including use of dopamine and milrinone.

Ischemia of the lower limb progressed, with initial demarcation at the hip level. Despite continuous infusion of morphine of 0.4 mg/kg/h and sedation with midazolam 0.1mg/kg/h, allodynic and hyperalgesic pain was difficult to control. Pain Treatment Service was consulted, an indwelling caudal-to-lumbar epidural catheter was placed, and an infusion of bupivacaine 0.1% with fentanyl 2 mcg/mL was initiated at 0.6 mL/h. Pain was effectively controlled and morphine was tapered to 0.2 mg/kg for wound care only. Because of tolerance to morphine, it was replaced with intermittent epidural injections of 3% chloroprocaine, 2.5 mL for daily wound care. Following effective control of pain and elimination of epidural and systemic opioids tracheal was extubation on the 9th day after start of epidural infusion.

Two days after epidural infusion the demarcation line receded and stabilized at mid-thigh. Necrosis debridement at the knee was done under combined epidural 3% chloroprocaine and general anesthesia. Trachea was extubated at the end of the surgery. Epidural catheter was removed 24 hours postoperatively because of concern of infection. Postoperative pain was managed with intermittent iv methadone for a week uneventfully.

Discussion

Combined arterial and venous occlusion resulted in significant ischemia to the lower extremity in this 2.5 kg infant. The use of epidural sympathetic blockade and analgesia substantially improved the control of ischemic neuropathic pain, which is poorly responsive to opioids.

Blood flow to the leg may have been improved. Epidural sympathetic blockade in adults increases limb blood flow and reduces the incidence of postoperative thrombosis. In healthy infants, epidural anesthesia to T5 induces blood pooling in the denervated lower extremities and a reflex vasoconstriction in non-anesthetized upper body and thereby maintaining cardiac output despite the high sympathectomy.(2) Nevertheless, epidural neural blockade can produce decrease sympathetic vasomotor tone of the reflex vasospasm of the collateral vessels and pain-induced sympathetic vasoconstriction may improve collateral blood flow and limit further ischemic damage.

References

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