



Case Report

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Exploratory laparotomy in a neonate under spinal anaesthesia

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Abstract

We report a case of the neonate presented with large sized perforation at the splenic flexure along with necrotising gangrene of 12cm of left transverse and descending colon at National Institute of Medical Sciences, Jaipur, who was operated under Spinal Anaesthesia.

Keywords: Spinal anaesthesia, Neonate, Laprotomy.

INTRODUCTION

Recent advances in perinatal care have improved the survival of sick neonates as well. Such neonates have either congenital or acquired anomalies and that requires surgical interventions. Now a days, subarachnoid anaesthesia is becoming very popular for surgery in neonates and infants, no longer its use is restricted to repairing congenital inguinal hernia. Recently its use is employed in neonates for diverse surgical procedures e.g. major abdominal surgery^[1], orthopaedic procedures on spine and lower limbs^[2], repair of meningocele^[3] and even for ligation of patent ductus arteriosus^[4]. The risks of fatal or life threatening events are increased several fold after major surgery, but there is debate about whether the type of anaesthesia has any substantive effect on these risks. Neuraxial blockade has several physiological effects that provide a rationale for expecting to improve outcome with this technique. The benefits seen for neuraxial blockade may be conferred by multifactorial mechanisms, including altered coagulation, increased blood flow, improved ability to breathe free of pain, and reduction in surgical stress responses^[5].

CASE REPORT

A male baby (pre-operative; Figure 1) was born to a full term primigravida by an uneventful normal delivery and on birth his APGAR SCORE was 7/10 and afterwards 10/10. Baby was doing fine till 40 hours after birth when he developed yellowish brown loose motions and 2 episodes of vomiting. On examination it was revealed that a lethargic 2.9kg male neonate having sluggish reflexes, a heart rate of 134/min and respiratory rate of 40/min. The assessed gestational age was term. The abdomen was distended with prominent superficial veins. Bowel sounds were also sluggish. Rectal examination was normal. Respiratory and cardiovascular system examination was unremarkable.

Plain x-ray abdomen showed distended bowel loops with multiple air fluid levels and gas in the wall of the left colon (Figure 2). On the basis of clinical presentation, X-ray findings of intestinal obstruction with pneumatosis intestinalis, a diagnosis of necrotising enterocolitis was made. Initially child was managed conservatively with intravenous fluids, broad spectrum antibiotics and nil orally but child showed no improvement. Within few hours his condition worsened and he developed tachycardia, tachypnoea and fever. His lethargy and abdominal distension increased. Repeated X-ray abdomen showed gas under the diaphragm.

A diagnosis of perforation of hollow viscous with faecal peritonitis was made and the child was taken up for surgery. Before surgery, examination was done which revealed a toxic, 2.8kg, six day old male neonate having features of septicaemia. His respiratory rate was 48/min, heart rate of 160/min and oxygen saturation of 82% on room air. The child was taken up immediately for laparotomy under spinal anaesthesia ASA grade IV E with high risk. Inj Bupivacaine (0.5%) 0.3ml was administered in the L4-L5 space using a 22 gauge hypodermic needle and an insulin syringe under all the aseptic precautions.

Monitors were attached to the child and continuous heart rate, respiration, oxygen saturation and ECG were monitored. Oxygen was administered by a face-mask. Ringer lactate at the rate of 15ml/kg/hour and whole blood 5ml/kg were administered.



Figure 1: Pre-operative male baby



Figure 2: Plain x-ray abdomen

Exploratory laprotomy revealed a large sized perforation at the splenic flexure along with necrotising gangrene of 12cm of left transverse and descending colon. Resection of the gangrenous large gut with end transverse colostomy and Hartman's procedure was done. Duration of surgery was about 75 minutes. Towards the end of surgery (60-70min), the child appeared to be uncomfortable and started to flex the lower limbs. Closure was completed by injecting Bupivacaine (4ml of 0.125%) at the wound edges.

The vital parameters of the patients were maintained at the preoperative level throughout the surgery. The oxygen saturation showed mild improvement due to oxygen supplementation. The lower limbs were flaccid and abdominal relaxation good. The child and the surgeon were comfortable throughout the surgery. Postoperatively the child's condition and vitals were similar to the preoperative status. The child was shifted to the premature baby unit but with time and medication

after a week, condition of the child began to improve and after a month of continuous treatment and support child was discharged in good state.

DISCUSSION

Neonatal surgery has always been performed under general anaesthesia. However, spinal anaesthesia is a safe and effective alternative to general anaesthesia for major abdominal surgery in high risk neonates. A variety of extensive surgical procedures, including small bowel resection and genito-urinary procedures have been successfully performed under central neuraxis block^[6]. In addition to reducing the incidence of postoperative apnoea, it has advantages of shorter operating time, avoidance of intubation and reduction in respiratory complication rate. It also reduces stress response to surgery and hospital stay.

Surgery generates a neuro-endocrine stress response in neonates, infants and children resulting in undesirable alterations in the metabolic state and immune function. Epidural anaesthesia depresses or even suppresses this stress response and is well tolerated in children^[7]. About central blocks, they do not affect left ventricular function and are virtually free of measurable haemodynamic effects, at least upto the age of eight years. In older patient, a sympathetic block results in a slight but constant reduction in blood pressure, rarely exceeding 10-20% of their pre-induction values. Preloading with saline is not recommended in children, even to treat haemodynamic effects of central blocks^[8].

Limited duration of action in one of the drawback of spinal anaesthesia for laparotomy. In this case the neonate started moving its lower limbs at the time of skin closure. Infiltrating the skin incision with Inj Bupivacaine circumvented this problem. It not only provided anaesthesia for completing the surgery but also provided postoperative pain relief.

CONCLUSION

Spinal anaesthesia for the above described case provided adequate analgesia and relaxation for laparotomy and gut resection. This was evident from the fact that intraoperatively, both heart rate and saturation did not alter significantly from their preoperative levels. It is well known that spinal anaesthesia reduces postoperative oxygen desaturation and bradycardia in formerly premature infants and sick neonates^[9]. This case helped to demonstrate that spinal anaesthesia has similar benefits in the intraoperative period.

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