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ORIGINAL ARTICLE

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Perioperative anaesthetic management of high-order repeat caesarean section: audit of practice in a university-affiliated medical centre

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ABSTRACT

Background: High-order (five or more) repeat caesarean sections (HORCS) are associated with increased rates of placenta praevia, placenta accreta and peripartum hysterectomy and prolonged surgical time secondary to intra-abdominal adhesions. This study summarizes our experience in the anaesthetic management of HORCS.

Methods: The files of all parturients undergoing HORCS between January 1995 and August 2007 were reviewed to determine surgical times, rates and causes of conversion from neuraxial to general anaesthesia and the need to supplement neuraxial anaesthesia with intravenous sedation.

Results: Parturients (n = 108) were 35 ± 4.5 years old with a gestational age of 37.5 ± 1.5 weeks, weighed 88 ± 20 kg and had undergone 6 ± 1 caesarean sections. Eighty-six (80%) were elective. Initial anaesthetic techniques included spinal (n = 80, 74%), epidural (n = 9, 8%), combined spinal-epidural (n = 6, 6%) and general anaesthesia (n = 13, 12%). Surgery lasted 38 ± 19 min (median 34, range 9-120). Fourteen parturients (13%) underwent intraoperative manipulations other than caesarean section, including three hysterectomies for haemorrhage (two placenta accreta, one praevia). There were no ruptures or dehiscences of the uterine scar, intraoperative bladder/ bowel injuries or re-explorations. Apgar scores <9 at 1 (n = 9, 13%) and 5 (n = 6, 5%) min were related to non-anaesthetic causes. Anaesthesia was converted from neuraxial to general in five cases (5/95, 5%) but only two were due to haemorrhage. No epidural top-up doses or intravenous sedatives/analgesics were required for spinal anaesthesia.

Conclusion: HORCS is not necessarily an indication for general anaesthesia provided uterine and placental abnormalities are sought preoperatively. In our practice single-shot spinal anaesthesia sufficed for uncomplicated HORCS.

Keywords: Anaesthesia, obstetrical; Caesarean section; Anaesthesia spinal; Anaesthesia, epidural; Complication

Introduction

High-order (five or more) repeat caesarean sections (HORCS) have been associated with increased rates of placenta praevia, placenta accreta and peripartum hysterectomy,[1] as well as prolonged surgery secondary to adhesions.[2] These findings suggest that the anaesthetic management of such parturients should take into consideration the high likelihood of both hemorrhagic complications and prolonged surgery. Data supporting the suitability of any anaesthesia technique for HORCS are, however, lacking.

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Most practitioners prefer regional to general anaesthesia for caesarean section because of the many advantages for both mother and infant.[3] Practitioners may choose between spinal, epidural and combined spinal-epidural (CSE) and in most circumstances each provides excellent surgical conditions and postoperative analgesia.

The Shaare Zedek Medical Centre in Jerusalem is a teaching hospital with the largest obstetric service in the region. This 550-bed hospital serves approximately 800 000 local residents. There are 10 delivery rooms plus two operating rooms. There are about 12 000 deliveries annually and a caesarean section rate of 11%. HORCS are performed routinely in our institution due to cultural opposition to limiting the size of the family, with most performed under neuraxial anaesthesia. Some practitioners are concerned that spinal anaesthesia may not be suitable for HORCS because of the inability to extend the duration of anaesthesia. The purpose of this study was to determine how often spinal anaesthesia was converted to general anaesthesia in these cases. In addition, we wished to determine the frequency with which supplementary analgesia was required, whether intravenously or via an epidural catheter when available.

Methods

Following waiver of informed consent by the institutional review board, parturients were identified retrospectively through the hospital computerized database. All parturients undergoing HORCS in the Shaare Zedek Medical Centre in the period between January 1995 and August 2007 were included in the study.

The obstetricians assessed the risk of adhesions, abnormal placentation and bleeding according to local protocols. The likelihood of encountering adhesions was assessed from previous surgery. Sources included hospital documentation or information received from the parturient herself regarding a history of surgical difficulty secondary to adhesions. All parturients who had undergone a previous caesarean section had ultrasonographic evaluation of placental location at least once during the third trimester of pregnancy. Magnetic resonance imaging was available in cases where abnormal placentation was suspected. Interventional radiology services were not available at the time of the study in the Shaare Zedek Medical Centre, although they have subsequently been introduced.

Elective cases were seen by the anaesthesiologist on the day before surgery. In addition, the anaesthesiologists were called to see parturients with suspected abnormal placentation booked for HORCS during their presentation to the prenatal clinic. Urgent cases were seen on the ward before transfer to the operating room and more urgent cases were usually seen on arrival in the operating room. In the preoperative visit both anaesthesiologist and obstetrician explained the potential complications of the operation, with particular reference to HORCS. The parturient then signed two informed consent forms: one for anaesthesia and one for surgery.

Caesarean sections were routinely performed in an operating room adjacent to the delivery suite, seven floors above the general operating theatre. In selected high-risk cases the general operating room was used. Anaesthesia was provided by senior anaesthetists with the assistance of a resident. The choice of anaesthesia was at the discretion of the anaesthetist. Single-shot spinal with 10 mg of 0.5% hyperbaric bupivacaine and opiate supplementation was the technique of choice unless the parturient requested otherwise, regional anaesthesia was contraindicated or failed or there was insufficient time for its provision. For epidural anaesthesia 2% lidocaine with 8.4% bicarbonate was used. Midazolam 1 mg i.v. was often given in our unit to reduce peri-operative stress and nausea. General anesthesia was induced with either propofol or thiopental and a muscle relaxant (succynylcholine followed by rocuronoium). The parturient was ventilated with a mixture of 50% O_2/N_2O. Following delivery, an opioid (fentanyl or morphine) was administered. Repeated doses of propofol and midazolam were provided as required. Volatile anesthetics (e.g isoflurane, sevoflurane) were usually avoided because of their potential uterine-relaxing effect.

In uncomplicated cases, before induction of anaesthesia two units of packed red blood cells (PRBCs) would be prepared in the blood bank but not brought to the operating room. For cases diagnosed as having placenta praevia without suspected abnormal placental penetration, two large-bore intravenous infusion lines rather than one were inserted and two units of PRBCs would be available in the operating room before the start of surgery. For cases in which there was evidence of abnormal placentation, a rapid infusion system and cell salvage would also be available in the operating room. In our institution, parturients with no relevant medical history would not receive blood until the haematocrit decreased to 21%. Blood loss was estimated only when blood was transfused.

All cases were attended at surgery by an experienced obstetric faculty surgeon with the assistance of a resident. Additional assistance of either a senior or junior surgeon could be recruited. In cases with significant risk of abnormal placentation surgery was performed through a midline incision. Otherwise the previous skin incision was used. The uterine incision was dictated by the placental location and the risk of fetal injury.

All women received uterotonic agents. Originally a single 10-unit bolus of oxytocin at the time of delivery was followed by an i.v. infusion of 10 units in 1L of Ringer's lactate solution. This practice was changed during the study period because of concerns over haemodynamic stability to an infusion only. If within 5-10 min