

Elaborate anesthetic management of cesarean section followed by abdominal radical hysterectomy for uterine cervical cancer: case report

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Cervical cancer is occasionally detected in pregnant women. If the patient desires the pregnancy, surgical treatment is recommended for cervical cancer at stage IA2 or IB1 when the fetus is mature enough to be delivered. A combination of spinal and epidural anesthesia for cesarean section, followed by general intravenous anesthesia for abdominal radical hysterectomy, was conducted in this case. Two catheters were placed in the upper extremity before anesthesia using ultrasound guidance for invasive arterial pressure monitoring and central venous access. General anesthesia was administered for the abdominal radical hysterectomy under propofol and remifentanyl target-controlled infusion to maintain bispectral index at 40–50. Postoperative analgesia was administered via the epidural catheter. The neonate (2475 g) was delivered in 6 minutes, and the Apgar score was 10-10-10 at 1, 5, and 10 minutes. After the surgery, which took 4 h 18 min in total, the patient awakened from anesthesia and was extubated without complications.

Keywords

Cervical cancer; Anesthetic management; Cesarean section; Abdominal radical hysterectomy

1. Introduction

Cervical cancer is frequently found in females of child-bearing age and occasionally in pregnant women. The incidence of abnormal cervical cytological findings is estimated to occur in 1-10/10,000 of all pregnancies [1]. According to the data from 13 hospitals in 12 provinces in China, the incidence of cervical cancer during pregnancy was 0.016% (52 / 330138), while 0.24% (52 / 21311) among the general population in the same period [2]. Conventional thought is that the pregnancy should be terminated, and cervical cancer should be treated as soon as possible once confirmed. However, a few national and international recommendations or guidelines have been developed for the management of cervical cancer in pregnant women [3, 4]. For confirmed cervical cancer with stage IA2 or IB1 during pregnancy, treatment may be postponed until the fetus deemed viable as recommended by a consulting neonatologist [4]. Therefore, some patients will undergo cesarean section and abdominal radical hysterectomy (ARH) at the same time. For anesthesiolo-

gists, challenges arise regarding the anesthetic management of cesarean section followed by ARH. The risk of intraoperative bleeding and hemodynamic instability increases due to physiological changes in late pregnancy and the complexity of the operation. Here we reported the anesthetic management strategy for a parturient with ARH for uterine cervical cancer immediately following cesarean section.

2. Case presentation

A 35-year-old woman was diagnosed with stage IB3 cervical cancer at 28⁺¹ weeks of pregnancy with no prior obvious abnormality. The tumor continued to progress in the following visits even after the initial chemotherapy treatment with TP regimen (combination chemotherapy of paclitaxel and cisplatin, paclitaxel 240 mg + cisplatin 120 mg) given at diagnosis. After a multi-disciplinary consultation with written informed consent, the patient insisted on continuing her pregnancy. Dexamethasone was given to promote fetal lung maturation; magnesium sulphate and other symptomatic support treatments were given before the patient was discharged to continue the pregnancy. ARH was scheduled for 34 weeks gestation immediately following cesarean section. Other complications for this pregnancy included uterine scarring (positive history of cesarean section), gestational diabetes (A1 level), and breech position.

Anesthesia for the cesarean section was performed with a combination of spinal and epidural anesthesia followed by general intravenous anesthesia for ARH. The informed consent for the anesthesia strategy was obtained with psychological support. On the day of operation, preoperative medication was given as follows: 10 mg metoclopramide intravenously (IV) and 0.5 mg penehyclidine IV. Before anesthesia was administered, ultrasound-guided catheterization of the right internal jugular vein and left radial artery was used to measure the central venous pressure and to monitor blood pressure. Two mL of 0.5% ropivacaine (heavy specific gravity) was injected, and 1 mL was injected cephalic in 20-25s after L_{2/3} subarachnoid puncture. Adjustment of anesthesia level was controlled below T5 by drug administration. The

neonate (2475 g) was delivered in 6 minutes, and the Apgar score was 10-10-10 at 1, 5, and 10 minutes.

Induction of general anesthesia started at 23 minutes after skin incision, and a bispectral index (BIS) monitor was placed. Anesthesia was induced with 16 mg etomidate, 12.5 mcg sufentanil, 10 mg cisatracurium besilate and 4 ng/mL remifentanil (Target controlled infusion, TCI). An oral endotracheal tube (7.0#) was inserted under guidance of fiberoptic bronchoscope and video laryngoscope because of a difficult grade III airway. Anesthesia was maintained with 2.5-3 $\mu\text{g}/\text{mL}$ propofol (TCI) and 3.5-4 ng/mL remifentanil (TCI). Propofol TCI was infused to maintain a BIS of 40-50. Remifentanil was administered at a constant intravenous infusion rate and noradrenaline was infused at 0.04-0.1 $\mu\text{g}/\text{kg}/\text{min}$ to maintain the mean arterial pressure within 10% of pre-induction baseline. Maternal end-tidal CO_2 was maintained at 30-35 mmHg. Four mL 0.75% ropivacaine was injected via epidural catheter every 1.5 hours. After the surgery, which took 4 hours 18 minutes in total, the patient awakened from anesthesia and was extubated without complications. There was no need for blood transfusion. Postoperative patient-controlled analgesia was administered via the epidural catheter (225 mg ropivacaine + 0.2 mg fentanyl + 10 mg dexamethasone + 66 mL normal saline, 100 mL total, 2 mL/hour for 2 days, 0.5 mL every press, with a lock time of 15 min), and a transverse abdominal plane (TAP) nerve block was conducted as well.

All the operation procedures including transabdominal hysterectomy, bilateral salpingectomy, pelvic lymphadenectomy, paraaortic lymph node biopsy, bilateral ovarian displacement, bilateral ovarian biopsy, incision drainage and pelvic drainage were successfully conducted. Postoperative diagnosis was: pregnancy combined with cervical cancer (IIIC_{1P} stage).

3. Discussion

As the third leading cause of female cancer related deaths annually, cervical cancer is strongly associated with infection by human papilloma virus (HPV) [5, 6]. Natural substances, such as curcumin and melatonin have been studied to treat early cervical cancer [7, 8]. In pregnant women, the standard management of cervical cancer is termination of the pregnancy followed immediately by hysterectomy or concurrent chemoradiation therapy. However, in this case, this mother desired to continue the pregnancy, creating a challenge to coordinate anesthesia for the cesarean section and radical hysterectomy at the same time. By reviewing this case, we gained experience from the preoperative evaluation, selection of anesthesia method, implementation of intraoperative anesthesia, and postoperative analgesia.

The basic condition of the patient was acceptable before operation based on laboratory and ancillary examination results. The combination of spinal and epidural anesthesia for cesarean section instead of general anesthesia was chosen to minimize affecting the fetus. Delivery of the fetus was fol-

lowed by total intravenous anesthesia for radical hysterectomy. During the preoperative evaluation, a psychiatrist was invited to conduct psychological counseling to relieve the anxiety of the pregnant woman according to the anesthesia method selected.

Generally, sevoflurane is most commonly used for general anesthesia during pregnancy [9, 10], but is not suitable for contraction of the uterus in cesarean section due to its uterine relaxation efficacy. Thus, the anesthesia strategy was modified to use total intravenous anesthesia during the radical operation for cervical cancer.

The risk of intraoperative bleeding was increased due to the rich blood supply of the pregnant uterus. To minimize potential damage of blind percutaneous puncture, ultrasound guidance was conducted before anesthesia to allow invasive arterial pressure monitoring and central vein puncture [11]. Tracheal intubation, under the guidance of a fiber bronchoscope, was performed after the cesarean section to ensure success of the intubation because the parturient was classified as having a grade III airway. Target controlled infusion of propofol and remifentanil was used successfully for anesthesia maintenance under continuous anesthesia depth monitoring. Careful monitoring of blood pressure control and heart rate was important for avoiding hemodynamic fluctuation and ensuring the stability of vital signs.

Furthermore, an epidural analgesia pump and TAP nerve block were used in combination for postoperative analgesia. Epidural analgesia is the primary choice for postoperative analgesia of either abdominal or pelvic surgeries [12]. Postoperative multimodal analgesia protocol improved pain relief and postoperative recovery for this patient.

4. Conclusions

For patients undergoing cesarean section followed by ARH, combined spinal and epidural anesthesia followed by general intravenous anesthesia is applicable and effective.

Author contributions

CWL conceived and designed the case report; JY wrote the paper. We would like to express our gratitude to all those who helped us during the writing of this manuscript.

Ethics approval and consent to participate

A written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available on request.

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Conflict of interest

The authors have no conflict of interests to declare.

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