Management of Neuraxial Anaesthesia for Emergent Caesarean Section for Placenta Previa

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Abnormal placental attachments, such as placenta accreta, increta or percreta, can result in increased morbidity and mortality because of the risk of severe postpartum haemorrhage. We aimed to present the management of spinal anaesthesia and surgical approach for emergent caesarean section because of vaginal bleeding in a multiparous pregnant woman with placenta previa at 36 weeks' gestation. Hyperbaric bupivacaine 12 mg, fentanyl 10 µg and morphine 150 µg were intrathecally administered for spinal anaesthesia. Oxytocin, methyl ergonovin and tranexamic acid were administered after umbilical cord clamping. Breech delivery of the baby was provided by a vertical incision to the uterus for avoiding placental harm. Subtotal hysterectomy was performed leaving the placenta in situ. Two units of red blood cells were transfused during the operation, lasting approximately 40 min. The patient was uneventfully discharged on the postoperative fourth day. In conclusion, a single-shot spinal anaesthesia was successfully maintained without conversion to general anaesthesia until the end of the hysterectomy in the patient in whom placenta increta was observed during caesarean delivery.

Keywords: Abnormal placental attachment, placenta previa, placenta increta, caesarean, spinal anaesthesia

Introduction

A four-category classification in which the urgency of a caesarean was first evaluated by scanning more than 400 cases with the collaboration of anaesthesia and obstetrics and gynaecology experts in 2000 (1). This classification was in practice after the proposal of the National Institute for Health and Clinical Excellence (NICE) in 2004 (2). The updated classification in 2011 is summarized in Table 1 (3).

In this case report, after the decision to perform an emergency caesarean upon vaginal bleeding, which is a presumptive diagnosis of placenta previa totalis and placenta adherence anomaly, was presented in a 36 week multiparous pregnant woman both anaesthesia and surgical management, starting from the preparation stage and also discussing the literature.

Case Presentation

A 34-year-old patient who had gravida 4, para 2, abortus 2 and 27th weeks' gestation according to the last menstrual period was referred to our clinic from an outside centre giving antenatal care. The patient presented with no other problem except for the diagnosis of placenta previa totalis and a pre-diagnosis of placenta adherence anomaly (accreta, increta or percreta). After admission of the patient to the hospital, a single live foetus compatible with the week of pregnancy and total placenta previa was observed in the obstetric ultrasound. Placental lacunae were observed in the area close to a former uterine incision of the patient who had history of two previous births by caesarean section. In addition, an increase in abnormal vascularisation was observed in the same area in colour Doppler ultrasonography. Antenatal care was continued considering the placenta adherence anomaly in the patient because of the findings supporting the invasion of the placenta into the decidua in pelvic magnetic resonance imaging. No additional obstetric complications developed in the follow-up period.

Although elective caesarean delivery was planned at 36th weeks' gestation, the patient underwent emergency caesarean because of the onset of bleeding one day before the planned date of birth.
Anaesthetic procedure

Primarily, two units of cross-matched packed red cells pre-prepared with blood group O Rh (+) were brought to the operating room. After receiving verbal and written informed consent, Ringer lactate (RL) and 6% HES solution were started via two vascular accesses with 16 and 18 G cannulae. Preoperatively, metoclopramide 10 mg + ranitidine 50 mg and 1 gram (g) of cefazolin were administered intravenously (iv). Standard monitoring (ECG, SpO2, heart rate, non-invasive blood pressure and urinary catheter) was performed. Spinal block was performed via midline in the sitting position between L3-4 intervertebral space with a 25-G Pencan spinal needle. Intrathecally, 12 mg of hyperbaric bupivacaine + 10 µg of fentanyl + 150 µg of morphine were injected. As soon as the pregnant woman was placed in the supine position, the surgery table was turned 15° to the left for providing aortocaval decompression.

About 12.5 min after spinal block and approximately 2.5 min after the skin incision, a baby girl (2520 g, 49 cm) was born. Apgar scores of the 1st and 5th minutes were 9 and 10, respectively. After the umbilical cord was clamped, an infusion of 20 iu oxytocin (Synpitan forte 5 iu mL⁻¹ ampoule, Deva, Tekirdag, Turkey) in 1000 mL RL was initiated intravenously. Immediately afterwards, 0.2 mg (1 ampoule) methylergonovine maleate (0.2 mg mL⁻¹ Metiler ampoule, Adeka, Istanbul, Turkey) was administered intramuscularly. In addition, a single dose of 250 mg (1 ampoule) tranexamic acid (Transamine 10%, 250 mg, 2.5 mL ampoule, Fako, Istanbul, Turkey) was administered intravenously. During the procedure, a total of 2 units (U) of packed red blood cells were given. Surgery ended in approximately 40 min. The patient was discharged uneventfully on the postoperative 4th day.

Surgical procedure

First of all, the abdomen was entered through midline incision. Abnormal vascularity in the former uterine incision line and a blue-violet placenta could be seen under the quite thin uterine wall. The abdominal incision was extended upwards and the uterus was exteriorized. The baby was delivered in breech presentation with a vertical incision to the fundus of the uterus in order not to damage the placenta. The placenta was left in situ after the umbilical cord was clamped. A subtotal hysterectomy, close to total, was performed without touching the placenta. In the uterus that was removed after the hysterectomy, the state of placenta increta in the area corresponding to the old uterine incisions was confirmed by pathological examination (Figure 1).

Discussion

In this paper, the administration of single shot spinal anaesthesia in an emergency caesarean at 36-weeks’ gestation for a multiparous pregnant woman in whom vaginal bleeding began together with a placenta previa totalis diagnosis and a pre-diagnosis of placenta adherence anomaly and utilizing a specific surgical approach was presented.

In a study conducted in Australia, after 47 of 444 green code initiatives were excluded because of missing data between the years 2000 and 2004, most of the remaining emergency caesarean indications were observed to be performed because of foetal distress. According to these records, it was reported that although general anaesthesia was used in 206 pregnant women and an epidural catheter top-up in 106 pregnant women, spinal anaesthesia was performed in 65 of them. In this study, the time from the decision to perform a caesarean delivery of the newborn for general, epidural and spinal anaesthesia were 17±6, 19±9 and 26±9 min, respectively, where the time interval was the longest in the spinal anaesthesia (4). Despite vaginal bleeding in our patient, because the haemodynamic status was stable, a single-dose spinal anaesthesia was preferred and was quickly performed at the first attempt.

In a survey conducted in the UK, it was reported that although the rate of general anaesthesia in category 1 emergency caesarean was approximately 51%, it was 4% in category 4 planned elective caesarean sections (5). In a similar retrospective study conducted in the United States, based on the data covering 10 years, it was stated that 52.2% of the caesareans with general anaesthesia were true emergencies (such as foetal

<table>
<thead>
<tr>
<th>Table 1. Classification of urgency making a caesarean decision</th>
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<tr>
<td>• Category 1: Immediate threat to the mother or fetus YES</td>
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<tr>
<td>• Category 2: Urgent threat to both NONE</td>
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<tr>
<td>• Category 3: Premature delivery requirements YES</td>
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<tr>
<td>• Category 4: Time for preparation of the mother or the birth</td>
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<td>team YES</td>
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Figure 1. The uterus was removed with the front wall opened, leaving the placenta after a hysterectomy. Placenta increta exists where a partial myometrium invasion is seen in the former uterine incision area (thick arrow)
According to a retrospective study in which only non-urgent elective caesarean sections were performed with spinal anaesthesia, it was demonstrated that an average time of 15.7±5.1 min passed from the spinal anaesthesia until the umbilical cord clamping (7). Because only the elective cases were discussed in this research and the spinal anaesthesia was considered to be the initial value for the decision of caesarean, therefore, the time interval seemed to be shorter (7). In our case, the baby was born approximately 12.5 min after the spinal anaesthesia. If the skin incision is taken as the base point, the umbilical cord was clamped and the baby was born within 2.5 min.

Whether accompanied by placenta previa or not, placental anomalies, such as placenta accreta, increta and percreta, are cases that may lead to hysterectomy and that have high maternal mortality and morbidity because of the risk of catastrophic haemorrhage. It was reported in one of the national retrospective studies that general anaesthesia was preferred at a rate of 86.2% in patients with placenta previa (8). In a large retrospective study where the anaesthetic approach in placenta accreta was scanned in Canada, it was identified that uterine artery embolization was performed in 23 of 56 892 births because of placenta accreta. It was reported that an epidural catheter was inserted at an early stage in all of these cases, and the procedure was then continued with regional anaesthesia in 17 patients with more than 2 L of blood loss, but 6 patients received general anaesthesia. It was reported that a hysterectomy was performed in only 11 cases in total (9). Although uterine artery embolization is a procedure used more often for myomectomy in our institution (10), it has not yet become a routine practice in pregnant women with placental implantation abnormalities to protect the uterus. Therefore, it is important to start anaesthesia while making the comprehensive preparations required for obstetric emergencies (Table 2) (11). Regarding our patient, as soon as the caesarean decision was made, preliminary preparations for anaesthesia were started. The blood products and equipment that should have been available in the operating room were supplied because of excessive bleeding risk. Since RL as well as colloid were administered through two large vascular accesses the blood pressure did not fall more than 50% of the baseline value of hypotension was not observed. However, because of the extensive invasion of placenta increta into the uterus and because this was the patient’s 3rd healthy baby and she did not desire another child, a hysterectomy was performed and oxytocin was discontinued.

It was shown that when tranexamic acid is used to reduce the risk of peripartum bleeding in placenta accreta and percreta cases, blood loss decreases both during and after the caesarean section (12). In these systematic reviews tranexamic acid was used at a dose of either 1 g or 10 mg kg⁻¹ before the skin incision. In our case, since the haemodynamics was stable, tranexamic acid was administered intravenously after umbilical cord clamping. At a lower dose of approximately 3 mg kg⁻¹.

In placenta previa and ablatio placenta that are the causes of antepartum haemorrhage, the choice of anaesthesia for caesarean section requires care. In high risk of massive bleeding, general anaesthesia is usually recommended for a patient who has more than 1500 mL of vaginal bleeding, more than 4 g dL⁻¹ of haemoglobin decrease and for who required more than 4 units of acute blood transfusion (11, 13). The American College of Obstetricians and Gynaecologists (ACOG) has a committee decision that is related to the choice of anaesthesia for obstetric emergencies that has been valid since 1992. Accordingly, it was reported that after a careful antepartum evaluation, if there are no medical contraindications, the risk may be reduced with regional anaesthesia in patients who require general anaesthesia for caesarean section (14). In our clinic, a single shot spinal anaesthesia was previously preferred in two pregnant women with placenta previa and ablatio placenta (15). Since regional anaesthesia was successfully implemented twice in one of these patients with placenta previa diagnosis, single shot spinal anaesthesia was performed for the 3rd time elective caesarean section as well. Since there was a partial placental ablation in the other case and due to the good condition of the foetus in Doppler, single shot spinal anaesthesia was performed.

It has been observed in the literature that combined spinal epidural (CSE) or continuous spinal anaesthesia was preferred in cases with placenta previa. Despite CSE anaesthesia planning for a caesarean-hysterectomy of the multip-

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**Table 2. General preparation of the operating room before anaesthesia and surgery for emergency caesarean section**

<p>| | |</p>
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<tr>
<td>1.</td>
<td>Evaluating the airway and intravascular volume carefully and quickly, taking measures if necessary.</td>
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<tr>
<td>2.</td>
<td>Establishing vascular access with two large iv catheters, being ready for rapid volume resuscitation (crystalloid-colloid) and starting immediately when necessary:</td>
</tr>
<tr>
<td>3.</td>
<td>Determination of haematocrit, blood group (if unknown) and cross match</td>
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<td>4.</td>
<td>Materials to be available in the operating room</td>
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<td>5.</td>
<td>Infusion heaters</td>
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<td>6.</td>
<td>Body heater</td>
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<tr>
<td>7.</td>
<td>Manually inflatable, pressure or automatic infusion devices</td>
</tr>
<tr>
<td>8.</td>
<td>2 units of packed red blood cells</td>
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<tr>
<td>9.</td>
<td>Asking for 4 more units of packed red blood cells later</td>
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arious pregnant woman who previously had complete placa-
enta previa diagnosis and two caesarean deliveries with a
single dose spinal anaesthesia, following unintentional dural
puncture during CSE, a spinal catheter was placed. How-
ever, during the surgery, lasting four hours placenta increta
was encountered, and due to the pulmonary oedema that
developed after about 8 L bleeding and 3.8 L of crystalloid,
1.5 L of colloid, 16 units of packed red cells, 16 units of
fresh-frozen plasma, 4 units of aphaeresis platelets and 1
unit of cryoprecipitate, the CSE anaesthesia was converted
to general anaesthesia (16). Because a regional technique with
catheter was preferred, a lower dose (6 mg of hyperbaric
bupivacaine, 10 µg fentanyl and 200 µg morphine) of intra-
theal drug was administered in comparison to a single dose
of spinal anaesthesia in our case. However, massive bleeding
and transfusion requirements and relatively long duration
of the surgery required conversion to general anaesthesia.

Conclusion

Although general anaesthesia is the first choice in most emer-
gency caesareans, after a careful antepartum assessment and
preparation, if there is no medical contraindication, a sin-
gle shot spinal anaesthesia can be preferred in an obstetric
emergency, such as placenta increta, without need to switch
to general anaesthesia. Besides, widely use of uterine artery
embolization in developed countries it has not gained full
functionality in our hospital yet. Therefore, surgical approach
that involves differences for the placenta increta case has been
presented under regional anaesthesia management, which
should present ideas to the anaesthesiologists.

Informed Consent: Written informed consent was obtained from
pregnant patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - B.G., M.K.; Design - B.G.,
M.K., I.G., G.I.; Supervision - B.G., M.K., G.I.; Resources - M.B.,
F.B., M.D.K., B.G.; Materials - M.B., F.B., I.G.; Data Collection
and/or Processing - M.D.K., B.G., F.B., M.B.; Analysis and/or
Interpretation - B.G., M.K., I.G., G.I.; Literature Search - B.G.,
M.K.; Writing Manuscript - B.G., G.I.; Critical Review - M.K.,
I.G., M.B.; Other - M.D.K., F.B., B.G.

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