Thoracic paravertebral block for breast surgery in a pregnant woman
-A case report-

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Non-obstetrical surgery during the first trimester is stressful to both the mother and the fetus. Anesthesiologists are also stressed, not only because of the effects of surgery itself, but also because of the uncertain influences of anesthesia thrown upon on the fetus. The authors present a case of breast surgery successfully performed on a woman 8 weeks pregnant requiring removal of breast abscess by the application of thoracic paravertebral block without any complications. Thoracic paravertebral block may be a safe anesthetic method for non-obstetric surgery during early pregnancy. (Korean J Anesthesiol 2010; 59: S73-S76)

Key Words: Breast surgery, Pregnancy, Thoracic paravertebral block.

When preoperative pregnancy test are performed on child-bearing aged women, 0.3–1.2% are shown to be positive [1]. Cases requiring non-obstetrical surgery during pregnancy is approximately 0.12% [2] and thus very low. However, when surgery is required, it becomes very stressful not only to the child bearer but also to the clinician. Anesthesia may cause physiological changes in the mother inducing teratogenic effects and fetal asphyxia, preterm labor, etc, to the fetus. It has been reported that the possibility of inducing deformity by clinically used anesthetics is almost nil; nonetheless, in cases undergoing surgery within 8 weeks of pregnancy, physiological changes of the mother caused by surgery and anesthesia may induce deformity, due to fetal organogenesis during that period. It is reported that if surgery is required during pregnancy, it is better to postpone it until the 2nd trimester if possible and preferably, perform regional anesthesia rather than general anesthesia [3].

The authors present a case of breast surgery successfully performed on a woman 8 weeks pregnant requiring removal of breast abscess by the application of thoracic paravertebral block (TPVB) without any complications.

Case Report

A 29-year-old female was under follow up observation at a local clinic for a mass in her left breast palpated 6 months prior to admission. Mass size increased due to pregnancy and showed inflammatory findings. She was thus transferred to our
hospital for surgical treatment. Gestational age on admission was 8 weeks. In her presurgical breast ultrasonography, in the area 4 cm from the ten o’clock direction of the left nipple an approximately 4 × 3 cm sized mass without any distinct boundaries thought to be an abscess was detected. In her past medical history, specific findings were denied and undetected. The mass was deeply located close to the fascia of the pectoralis muscle, thus difficult to operate by local anesthesia. Pretreatments were not given. In the operating room, it was decided that TPVB be performed because it would affect the fetus less than general anesthesia. The consent of the patient was obtained after through explanation of the anesthetic method. Basic monitoring equipments were attached to the patient. Initial blood pressure was 120/70 mmHg and pulse rate 82 beats per minute. Other specific findings were undetected. The patient took a sitting position with an assistant was positioned in front of her. She was asked to lower her head and lean against the chest of the assistant. After marking the C7 spinous process (SP) to the T1 SP with a skin marker, each mark of the T1 SP to the T5 SP was marked again horizontally 2.5 cm left of the initial mark. After marking the areas, her skin was prepared with povidone iodide solution and subsequently, 1.5 ml of 2% lidocaine was injected into each marked point subcutaneously. Afterwards, using five 20 gauge Tuohy needles, the skin of each point was pricked vertically. If the tip of the needle touched the transverse process, the needle was retreated and advanced by changing directions toward the head. The paravertebral space was assessed through a loss of resistance technique, and then the site was fixed. Each of the needles was installed in the marked site from the T1 SP to the T5 SP where a total of 20 ml of 0.5% ropivacaine, 4 ml each, was injected. The needles were then removed (Fig. 1). Sterile dressing was performed on all areas injected with the drug. The patient then took the supine position, and blood pressure and pulse rate were 100/55 mmHg and 100, respectively. Other specific findings were undetected and the patient did not portray any particular symptoms. The blockage range evaluated by an ice test of the area from T1 to T10. During surgery, the patient presented with severe anxiety and requested to be put asleep, and so propofol (Fresofol®, Fresenius Kabi, Austria), a pregnancy risk category B drug, was injected using a syringe pump (Pilote anesthesie IS, Fresenius vial S.A, France) at the rate of 90 μg/kg/min. Total anesthesia time was 60 minutes and the total operation time was 40 minutes. After surgery, she was transferred to a recovery room for 45 minutes in order to detect any pain or other special findings she might experience. After transferring to a ward, where she also did not experience any pain, further analgesics were not administered.

In the ultrasonography performed the day after surgery, fetal heart beat was 180 bpm, and gestational age measured by crown-to-rump length was 8 weeks + 5 days. The patient was treated with cefotiam 1 g/day through intravenous infusion for 4 days and was discharged without any complications.

Discussion

In cases performing surgery for non-obstetrical problems during pregnancy, maternal death, miscarriages, elective termination, and delivery induced by surgical procedure may be induced. For the fetus, fetal death, prematurity, and major birth defects may be induced. Particularly in cases undergoing surgery during the 1st trimester, the incidence of major malformation has been reported to be approximately 3.9%. Maternal death rate is very low. However, during the entire pregnancy, the incidence of miscarriage or fetal death has been reported to be 5.8%, and the risk raised to 10.5% during the 1st trimester. It has been reported that cases of selective termination due to anxiety of the birth of deformed babies were approximately 1.3% [4].

In cases which the patient must receive surgery unavoidably, safety of the mother and the fetus associated with anesthesia and surgery becomes an important issue. According to the standard labeling of drugs used in pregnancy which was organized in 1979, they are classified in 5 categories. Based on the research data conducted on animals and humans, the Food and Drug Administration classifies them as follows: I A, Controlled studies have shown no risk; I B, No evidence of risk found in human beings; I C, A risk cannot be ruled out; I D, Positive evidence of risk exists; I X, The drug is contraindicated in pregnancy [5]. In animal experiments, nitrous oxide induces resorption and anomaly of the fetus [6]. In another
According to the direction of the accessed needle, the classical approach is to vertically come in 2.5 to 3 cm lateral to the midline. The medial approach is to come in 1 cm laterally, and paravertebral-peridural block is to approach 45° on the coronal plane [9], in concern with the frequency of injection, satisfactory results were obtained in more than 90% by a single injection [11], and it has been also reported that in comparison to single injection, success rate was noticeably high in multilevel injection [12].

In a study conducted on patients undergoing thoracotomy, regarding postoperative pain control during the postoperative period, TPVB was superior to TEB. Pulmonary function tests utilizing the peak expiratory flow rate and oximetry similarly showed better results [13]. Complications may develop in both TEB and TPVB. However, TPVB performed in the epidural space can result in catastrophic injuries such as spinal cord injury, and so TPVB may be a safer procedure.

Hypotension or urinary retention due to the blocking of the sympathetic chain may occur in both TEB and TPVB, but the incidence is higher in TEB. Postoperative nausea, vomiting, and respiratory depression are more frequent in TEB than TPVB. In addition, the success rate of TPVB is higher [14]. When comparing bupivacaine with ropivacaine use in breast surgery, cases using ropivacaine showed better results regarding the satisfaction of the patient after surgery, and the continued analgesic period [15].

The authors performed TPVB that is hemodynamically safer and produce fewer complications in comparison with TEB. To raise blockage success rates, multilevel injection was performed, and ropivacaine, which is known for its excellent effects in the aspect of longer analgesic time, was used.

In summary, the authors performed TPVB in a woman 8 weeks pregnant considering the risk/benefit ratio and the effects of anesthetics on the mother and the fetus. Without complications, the breast abscess was safely and successfully removed.

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