Cesarean Section of a Pregnant Woman Associated with Infection of Rubella

Hiromasa MITSUHATA*, Kei SHOJI, Keiji ENZAN,
Shigeru MATSUMOTO*, Junichi HASEGAWA*, Kousei OHTAKA,
and Shin KUROSAWA

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Infection with toxoplasma, rubella, or herpes simplex virus may cause abnormalities of fetus[1-3] and severe sequelae in the mother. Intrauterin infection with rubella virus during the first trimester of pregnancy may cause the congenital rubella syndrome, but infections after 24 weeks of gestation is not known to cause the same syndrome[3]. Since cell-mediated immunity is depressed during pregnancy, pregnant woman may be susceptible to some infectious diseases[4]. Early diagnosis and prompt treatment of such infection offer the best hope for maternal and fetal survival in woman who contact rubella during the third trimester of pregnancy. This case report presents a woman at 38 weeks gestation and infected with rubella who underwent an emergency cesarean section. The choice of anesthesia for the cesarean section in such a case must take into consideration potential postoperative complications of the mother and the newborn.

Case report

The patient was a 31-yr-old, gravida 2, para 2, 159-cm, 62.6-kg woman at 38 wk gestation. She was admitted to hospital in labor and underwent an emergency cesarean section for fetal distress. The day before the admission, she had developed a reddish rash which spread to her anterior chest, forearms, and inner region of thigh. Her two children had also had rubella 1 week before her admission to hospital. At the time of admission, she was awake and alert with a temperature of 37.8°C. Blood pressure was 128/68 mmHg and pulse was 96 beats·min^{-1}. Her past medical history was negative. Preoperative laboratory evaluation was unremarkable, except for mild thrombocytopenia (156,000 ·mm^{-3}). A reddish, edematous rash, partially fused, was present over her entire body. Signs and symptoms, and family history were strongly suggestive of a diagnosis of rubella. However, at the time of admission to hospital her rubella hemagglutination inhibition (HAI) antibody test was negative. Using an 18-G Tuohy needle inserted at the L1-2 interspace and a loss-of-resistance technique, epidural anesthesia was induced with 18 ml of 1% mepivacaine administered caudally and 6 ml of 2% mepivacaine cephalad, following a test dose of 2 ml of 1% mepivacaine. The epidural catheter was then threaded about 5 cm cephalad in the epidural space. Anesthesia was maintained with 1% mepivacaine until the birth of the baby. Fourteen min after placement of the epidural block, the operation started and the baby was delivered at 3 min after the incision of the skin. Apgar scores at 1 and 5 min after

Department of Anesthesiology, Akita University School of Medicine, Akita, Japan

**Department of Anesthesiology, Hiraka General Hospital, Yokote, Japan*

Address reprint requests to Dr. Mitsuhata: Department of Anesthesiology, Hiraka General Hospital, 1-30, Ekimae-cho, Yokote, Akita, 013 Japan

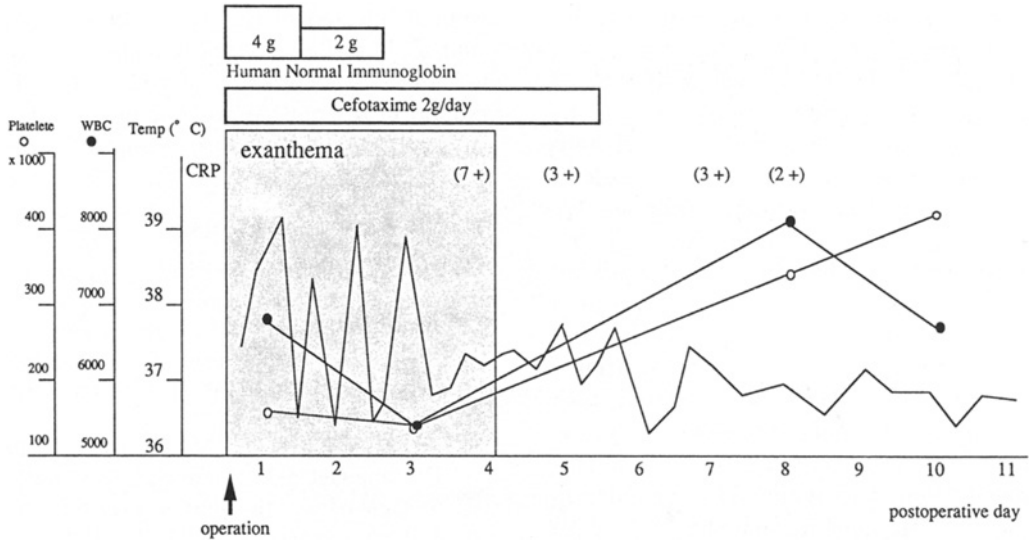

Fig. 1. Postoperative clinical course of the case

the birth were both 9, respectively. After the delivery anesthesia was maintained with epidural analgesia and oxygen 2 $l \cdot min^{-1}$ and nitrous oxide 4 $l \cdot min^{-1}$ with a face mask under spontaneous breathing, and with 30 mg of pentazocine intravenously. Infusion of human normal immunoglobin started after the delivery for treatment of virus infection. The surgical course was uneventful, and bleeding volume, including amnion fluid, was about 600 ml.

The postoperative course is shown in figure 1. An intermittent fever of 38–39°C continued for 3 days postoperatively. On the 4th postoperative day the fever subsided and the rash also disappeared. Total white cell and platelet counts were 5,400 to 8,100 $\cdot mm^{-3}$ and 156,000 to 374,000 $\cdot mm^{-3}$, respectively. Therapy for the virus infection included administration of human normal immunoglobin, 4 g on the 1st postoperative day and 2 g on the 2nd day, and cefotaxime 2 $g \cdot day^{-1}$ for 5 days postoperatively. The rubella HAI antibody titer of both mother and baby were negative immediately following delivery. However, the mother's titer was $>$ 1:512 on postoperative 10 day whereas the baby's titer remained negative. Following discharge, the rubella infection was confirmed in the mother but vertical infection of the baby with rubella was denied. The mother and baby were discharged on postoperative 11 day without any complications or sequelae.

Discussion

Rubella, characterized by lymphadenopathy, fever, and rash, is a mild, self-limited disease seldom followed by complications or sequelae of any kind[5]. However, if a pregnant woman is infected with rubella during the first trimester of pregnancy, infants may be born with the stigmata of the rubella syndrome, including neurologic abnormalities, congenital heart disease, cataracts[3]. The complications of rubella in adults are reported to be arthritis, thrombocytopenic purpura, and encephalitis. Arthritis is most common but usually mild and transitory. Thrombocytopenic purpura is severe but is always self-limiting. Depression of the platelet count frequently occurs for several days during the course of rubella without evidence of purpura. Morbidity due to postinfectious encephalitis is reported to be 2.7%–0.3%[5].

In this case, since the gestation was 38 weeks, congenital rubella syndrome caused by maternal infection would not be a concern. Of importance in making the choice of

anesthesia technique, it is important to consider of general or epidural anesthesia was better for a woman infected with rubella who requires a cesarean section. At the time of operation, although the clinical findings were strongly suggestive of diagnosis of rubella, confirmation was not available. We chose epidural anesthesia in this case because at least healthy parturients, epidural analgesia is reported to prevent depression of cell-mediated immunity in mothers and newborns during the stress of parturition[6]. Also epidural anesthesia is associated with less reduction of monocyte-mediated cytolysis, blast formation of lymphocyte by phytohaemagglutinin, and lymphokine production compared with general anesthesia[7,8]. Also general anesthesia depressed blast formation of lymphocyte by phytohaemagglutinin, concanavalin A, pokeweed mitogen, and staphylococcal protein A in newborns compared with older children[9].

Pregnancy is associated with suppression of humoral and cellular mediated immunity and accordingly a pregnant woman is susceptible to infection[4]. Since the patient had been exposed to her infected children prior to the labor, infection with rubella was strongly suspected. Rubella is a benign, self-limited disease, however, since confirmatory diagnosis was not available, other kinds of infection, which could cause severe complications and sequelae in both the mother and newborns had to be considered when we performed the cesarean section[1,2]. We selected epidural anesthesia for the operation because epidural anesthesia causes less depression of cell-mediated immunity of mother and newborn compared with general anesthesia. General anesthesia may severely depress cell-mediated immunity and exaggerate the infection. Therefore, we think that epidural anesthesia is theoretically better than general anesthesia for cesarean section in the case of virus-infected pregnant woman.

In summary, we performed epidural anesthesia for cesarean section of the pregnant woman infected of rubella at 38 week gestation. Epidural anesthesia was chosen because it shows less depression of cell-mediated immunity of the mother and the newborn.

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References

1. Frieden FJ, Ordorica SA, Goodgold AL, Hoskins IA, Silverman F, Young BK: Successful pregnancy with isolated herpes simplex virus encephalitis: Case report and review of the literature. Obstet Gynecol 75:511–513, 1990
2. Meisel RL, Alvarez M, Lynch L, Chikara U, Emanuel DJ, Berkowitz RL: Fetal cytomegalovirus infection: A case report. Am J Obstet Gynecol 162:663–664, 1990
3. Horstmann DM, Banatvala JE, Riordan JT, Payne MC, Whitemore R, Opton EM, duVe Florey C: Maternal rubella and the rubella syndrome in infants. Amer J Dis Child 10:408–415, 1965
4. Cunningham FG, MacDonald PC, Grant NF: Williams Obstetrics, 18 edition, Norwalk, Appleton & Lange, 1989, pp. 143
5. Green RH, Balsamo MR, Giles JP, Krugman S, Mirick GS: Studies of the natural history and prevention of rubella. Am J Dis Child 110:348–365, 1965
6. Ryhänen P, Jouppila R, Lanning M, Hollmén A, K. K: Effects of segmental epidural analgesia on changes in peripheral blood leukocyte counts, lymphocyte subpopulations, and in vitro transformation in healthy paturients and their newborns. Gynecol Obstet Invest 17:202–207, 1984
7. Hole A, Unsgaard G, Breivik H: Monocyte functions are depressed during and after surgery under general anaesthesia but not under epidural anaesthesia. Acta Anaesthesiol Scand 36:301–307, 1982
8. Hole A: Per- and postoperative monocyte and lymphocyte functions: Effects of combined epidural and general anaesthesia. Acta Anaesthesiol Scand 28:1984
9. Puri P, Bradil J, Reen DJ: Immunosupressive effects of anesthesia and surgery in the newborn: I short-term effects. J Pediatr Surg 19:823–828, 1984