Entrapment of After-coming Head in Cesarean Breech Delivery of Term Pregnancy: A Case Report

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ABSTRACT

Nowadays, the majority of breech deliveries are by cesarean section. In Siriraj Hospital, planned vaginal breech delivery is not our current practice. Compared with vaginal breech delivery, cesarean section can significantly reduce neonatal complications, with a trivial increase in maternal complications. However, cesarean section cannot alleviate all of the complications. In the present report, a case with entrapment of after-coming head in cesarean breech delivery of a term fetus was described, and the management of this emergency condition was reviewed.

Keywords: Entrapment, after-coming head, breech delivery

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Pregnancy with breech presentation is found in approximately 3% of all singleton deliveries.[1] The incidence in Siriraj Hospital during 2004-2007 were 2.9%, 4.1%, 4.6%, and 4.5%, respectively.[2] In each year, the rate of cesarean breech delivery were 86.7%, 89.3%, 92.9%, 92.1%, respectively whereas that of vaginal breech delivery were 13.3%, 10.7%, 7.1%, and 7.9%, respectively (Table 1). This incidence is greatly influenced by gestational age. More than 20% of fetuses by 28 weeks' gestation are in the breech presentation, but most of them spontaneously convert to vertex presentation by term gestational age.[3] Predisposing factors for breech presentation include uterine distension or relaxation (grand multiparity, multiple gestation, polyhydramnios), uterine anomaly (pelvic tumors, uterine anomalies), fetal abnormalities (anencephaly, hydrocephalus, low birth weight), maternal or obstetric conditions (previous breech, oligohydramnios, nulliparity, advanced maternal age, preterm delivery), and placenta previa.

Breech presentation increases the risks of morbidity and mortality to both fetus and mother. Although the risk increment is largely caused by the aforementioned predisposing factors for breech presentation, mode of delivery, either vaginal delivery or cesarean section, is the topic of major concern. Systematic review and meta-analysis[4,5] revealed that vaginal delivery of breech fetus has a high incidence of major labor complications, including cord prolapse (7.4%), nuchal or extended arms and head entrapment (up to 8.5%). The causes of these may be uterine constriction ring, and the cause of the constriction ring may be uterine contraction with the condition of abnormal presentation which cannot be delivered normally. Moreover, the risk of perinatal death was increased nearly 4-fold. However, maternal morbidity rate was lower in the vaginal delivery. In 2000, Hannah et al[6] published the first multinational randomized trial evaluating the effect of planned vaginal delivery vs. elective cesarean section in term breech fetus. It was found that neonatal mortality and serious morbidity was lower in the cesarean section group compared with the vaginal delivery group (1.6% vs. 5.0%); whereas the maternal morbidity was not increased. In this study, 43.3% of the trial of vaginal breech delivery group converted to cesarean section during the intra-partum period. The authors concluded that for every 14 additional cesarean breech deliveries, one baby would avoid serious morbidity or mortality. Although the study has been criticized in many aspects,[7] the results have an impact on current clinical practice. In 2001, the American College of Obstetricians and Gynecologists (ACOG) recommended that, "Patients with a persistent breech presentation at term in a

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TABLE 1. Incidence of breech delivery and mode of delivery during 2004-2007 in Siriraj Hospital.[2]

Year	2004	2005	2006	2007
Total delivery (N)	9,104	8,712	7,078	9,080
Breech delivery, n (%)	264 (2.9)	354 (4.1)	325 (4.6)	405 (4.5)
Mode of breech delivery n (%)*				
Cesarean section	229 (86.7)	316 (89.3)	302 (92.9)	373 (92.1)
Vaginal breech delivery	35 (13.3)	38 (10.7)	23 (7.1)	32 (7.9)

*percent per total pregnancy with breech delivery

singleton gestation should undergo a planned cesarean delivery." Nevertheless it stated that, "A planned cesarean delivery does not apply to patients presenting in advanced labor with a fetus in the breech presentation in whom delivery is likely to be imminent or to patients whose second twin is in the nonvertex position."[8]

Nowadays, more than 80% of breech deliveries in the USA are by cesarean section.[1] In Siriraj Hospital, planned vaginal breech delivery is not our current practice. Although cesarean section can reduce complications of breech delivery, it cannot alleviate all of them. In the present report, a case with entrapment of after-coming head in cesarean breech delivery of a term fetus was described, and the management of this emergency condition was reviewed.

CASE REPORT

A 30 years old woman (initials P.S., HN xxxxx/45), G2 P1, had antenatal care at a private hospital in Bangkok. Her first pregnancy was uneventful and was terminated by elective cesarean section at 38 weeks gestation, 9 months prior to the first visit for the present pregnancy. Since the cesarean section, her menstruation had not yet resumed, probably due to lactational amenorrhea. The first visit of the present pregnancy started when she experienced quickening without preexisting symptoms of pregnancy. Two weeks later, she had a screening obstetric ultrasonography, which revealed a normal intrauterine female fetus compatible with 20 weeks' gestation in breech presentation. Other ultrasonographic findings included normal placentation located at the posterior wall of the uterus, normal amniotic fluid volume, and no abnormal adnexal or myometrial mass. Ultrasonography was not repeated in follow-up visits. At 32 weeks gestation, the physical examination demonstrated a transverse lying fetus which spontaneously rotated to longitudinal lying in subsequent visits.

The patient had painless water breaking at 38 weeks' gestation. General physical examinations were within normal limits. The fetus was lying in a longitudinal position. A fetal heartbeat of 140 beats/min was located in the right lower quadrant of the maternal abdomen. There were no rhythmic uterine contractions. The cervix was 1 cm dilated and 50% effaced. The membranes were absent. The presenting part of the fetus was a foot. An emergency cesarean section was performed due to the fetus in footling breech presentation with premature rupture of membranes and previous cesarean section.

The cesarean section was performed under spinal anesthesia. The abdominal wall was opened using the Pfannenstiel technique. After entering the abdominal cavity, it was found that the gravid uterus had an hourglass shape as in Figure 1. The constriction part of the uterus was thought to be myometrial contraction rather than uterine anomaly since the normal uterine shape was evidenced during the first cesarean section. The operation was halted and the uterus was covered with a moistened abdominal swab, giving time for uterine relaxation. After a 5-minute waiting period, there was no change in the uterine shape. The surgeon decided to go ahead with the operation by making transverse incision at the lower ballooning part of the uterus, expecting that the constricted part of the uterus could be conquered during extraction of the baby. There was a minimal amount of amniotic fluid gushing out of the uterine incision. The baby was delivered using the standard technique for breech extraction. In brief, the baby's ankles were grasped and pulled out off the uterine incision and the successive higher portions of the baby were grasped and pulled until the buttock was emerged. The surgeon's thumbs were placed over the sacrum and the fingers over the hips of the baby, rotating the baby's back to anterior and pulling the body downward until the scapulas were visualized. The surgeon's finger sweep the humerus downward passing the anterior of the baby to deliver the arms, one after the other. The after-coming head was delivered using the Mauriceau maneuver, but the delivery was unsuccessful

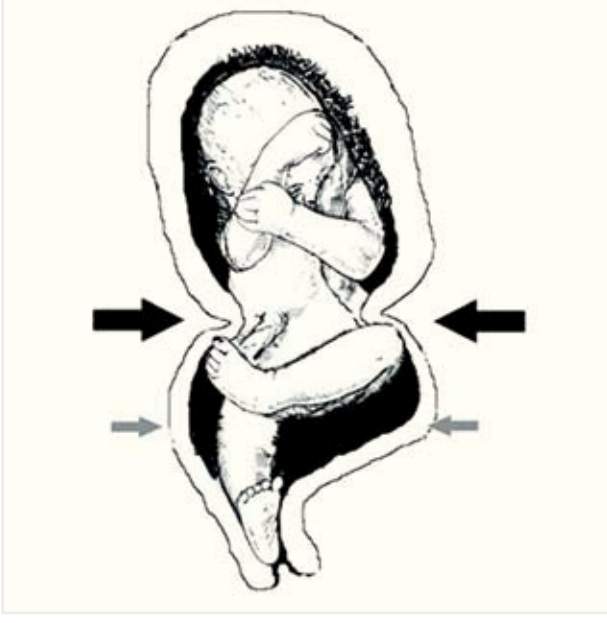

Fig 1. Diagram of the gravid uterus in the present case; the hourglass shaped uterus has constriction ring at the level between the upper and lower uterine segment (big black arrows). Small grey arrows indicate the location of low transverse uterine incision.

as the head was entrapped above the constriction ring. A midline uterine incision, approximately 5 cm long, was promptly made upwardly from the transverse incision across the constriction ring to the upper ballooning part of the uterus. The baby's head was then released and delivery was accomplished within a few seconds after the second uterine incision was made. Placenta could be removed without difficulty. After delivery the uterus has a good contraction rendering normal contour without hourglass appearance. The inverted-T shape uterine incision was closed in 2 layers. Tubal ligation was performed. The abdominal wall was closed layer by layer.

The newborn baby had the APGAR score of 8 and 10 at 1 and 5 minutes, respectively. Her physical examination revealed no obvious abnormality. Her birth weight was 2,850 grams and her Ballard score was compatible with 38 weeks and appropriate for gestational age.

DISCUSSION

Fetal head entrapment is the most dreadful complication associated with vaginal breech delivery. Fortunately, this complication is rare and there was no report of this condition in during 5 years in Siriraj Hospital. It is more likely to occur in the premature fetus. To release the entrapment, an obstetrician may try one of the following measures: (i) attempt the Dührssen incisions by cutting the cervix at 2, 6, and 10 o'clock to increase the size of the cervical aperture,[1] (ii) request an anesthesiologist to provide inhalation anesthesia for uterine relaxation,[9] or (iii) perform an emergency cesarean section (abdominal rescue).[10]

Fetal head entrapment during cesarean breech delivery is even less common. It usually occurs in a premature fetus when the lower uterine segment is not thinning out. As a consequence the low transverse uterine incision is usually too small to deliver the fetus. Some obstetricians advocate a low midline uterine incision for cesarean breech delivery as the incision can be easily extended when the entrapment occurs.[11] However, even the classical (vertical) uterine incision cannot guarantee successful delivery of fetus; as there was a report of entrapment of the second twin at cesarean delivery complicated by a tight uterine contraction after delivery of the first twin.[12]

In the present case, the entrapment occurred in a full term fetus and the uterus had a well formed lower segment. The entrapment was caused by abnormal contraction (contracture) at the junction between the upper and lower uterine segment. The cause of the contracture was unknown. The irregular contour of the intrauterine content, i.e. footling breech fetus with totally leakage of amniotic fluid, might predispose the uterus to the contracture. Uterine anomaly must be differential for this contracture; however, the anomaly could be excluded in the present case because the normal uterus was already evidenced during the first cesarean section and the uterus contracted normally rendering normal uterine contour after delivery of the present fetus.

Abnormal hypertonic uterine contraction can occur during cesarean section; moreover, it can occur in cases of elective cesarean section before true labor (i.e. before having regular uterine contractions).[12] Nowadays, cesarean section is routinely performed under regional anesthesia, which has little or no effect on uterine contractility, neither contraction nor relaxation. When unexpected uterine contraction occurs during extraction of a fetus out of the uterine cavity, it can entrap the fetus and cause catastrophic consequences. When encountering this condition, the life-saving measure is prompt uterine relaxation, which can be achieved by intravenous beta-mimetic drugs or nitroglycerin.[13]

Nitroglycerin (NTG) is an interesting tocolytic agent during cesarean section because it is easy to apply, has quick onset of action, and is safe for both fetus and mother. NTG is a potent smooth muscle relaxant and its use in various obstetric emergency conditions is well documented.[14] Intravenous doses of 50 to 100 mcg can provide uterine relaxation within 30 to 90 seconds. An intravenous bolus up to 1 mg has been described without significant maternal hypotension.[15] NTG can facilitate extraction of an entrapped head during cesarean breech delivery.[16] However, it might not be applicable for extraction of the entrapped fetal head during vaginal breech delivery.[17]

In the present case, the entrapped fetal head could be released by the vertical incision in addition to the low transverse incision. In fact, this vertical incision could have been avoided if a uterine relaxation measure had been applied. In general, the vertical uterine incision is not desirable because of the risk of uterine rupture in subsequent pregnancy is higher in the vertical than the low transverse incision.[18] Fortunately in the present case, the vertical incision caused no problem because the patient had no need for further pregnancy.

NTG may be more beneficial than vertical incision because it is easy to use, rapid onset and can be used during vaginal breech delivery, but in the case which has a vigorously constriction ring or failed from using NTG for uterine relaxation, surgical procedure should be done. However, in the case which needs future fertility, vertical incision or inverted T incision of the uterus may introduce a uterine scar and increase the risk of uterine rupture during pregnancy.

Although cesarean breech delivery can reduce complications found in vaginal breech delivery, it cannot get rid off all of the complications. Obstetricians still have to be skillful with accurate techniques of vaginal breech assistance and breech extraction because such techniques are also appropriate to deliver a baby during cesarean section. Using the right technique can facilitate delivery and avoid injuries to the baby. Moreover, a ready-to-use uterine relaxing agent should be available in the operating room in order that it can be promptly used when abnormal uterine contraction causes fetal entrapment.

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