**Case Report**

# Multiple Congenital Anomalies with Breech Presentation: Dilemma in Diagnostic Procedures, Delivery Management, and Counseling in Developing Country

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## Abstract

**Objective:** Multiple congenital anomalies present significant diagnostic and management dilemmas, particularly in resource-limited settings. Globally, these conditions affect approximately 1 in 33 infants and are a major contributor to perinatal mortality. We report a rare case of a term pregnancy with severe, undiagnosed multiple congenital anomalies, highlighting the challenges in diagnosis, delivery management, and counseling in a developing country.

**Case Illustration:** A 22-year-old primigravida presented at 35-36 weeks of gestation in active labor with a fetus in breech presentation. Antenatal ultrasonography at 27 weeks had revealed a single live fetus with severe fetal growth restriction, polyhydramnios, and multiple structural anomalies suspicious for an underlying trisomy. Amniocentesis was offered for a definitive diagnosis but was declined by the family. A female neonate was delivered via spontaneous vaginal breech delivery, with low APGAR scores. The infant was admitted to the High Care Unit for respiratory support but passed away the following day due to respiratory failure. The family had opted for a Do Not Resuscitate (DNR) status.

**Conclusions:** In cases of severe fetal anomalies detected by ultrasound, advanced genetic testing like NIPT followed by diagnostic testing should be offered to facilitate definitive diagnosis and counseling. Delivery decisions in such cases should be individualized, prioritizing maternal safety while considering the fetal prognosis. This case underscores the urgent need for improved access to and awareness of genetic counseling and diagnostic services in developing countries to optimize perinatal outcomes.

**Keywords:** breech presentatoin, developing countries, genetic counceling, multiple congenital anomalies, prenatal diagnosis.

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## INTRODUCTION

Severe congenital abnormalities represent a significant global health challenge, profoundly impacting perinatal and infant mortality as well as morbidity throughout infancy and childhood. Globally, the World Health Organization (WHO) estimates that major congenital anomalies affect approximately 1 in 33 infants, contributing to hundreds of thousands of neonatal deaths annually. [1] In developing countries like Indonesia, these conditions are a leading cause of infant mortality, underscoring the critical need for effective prenatal detection and management.[2] These conditions are known to affect at least 2% of fetuses and newborns.[3-5] Over the past few decades, ultrasonography examinations have become a cornerstone in identifying a growing number of these defects during pregnancy. An effective prenatal diagnosis offers several benefits, such as optimizing prenatal care management, connecting pregnant women with the appropriate level of care, and planning the baby's postnatal care.[6,7] While many fetal defects have been attempted to be corrected intrauterine, the results have not been consistently satisfactory thus far.[3-7]

The foundation of first- and second-trimester screening for common genetic disorders is fetal observation through ultrasound, complemented

by maternal biomarkers and genetic testing. Since the advent of non-invasive prenatal testing (NIPT), which sequences cell-free fetal DNA, the diagnostic rate for common trisomies and sex chromosomal aneuploidies has significantly increased.[6,7] However, as its usage grows, the optimal ways to integrate NIPT into prenatal care are becoming less clear, a situation complicated by a lack of understanding among clinicians and families regarding the test's limitations, particularly in complex congenital anomaly cases. Moreover, the role and accessibility of such advanced testing in developing countries remain debated.[6,7]

Herein, we report a rare case of a 35-36 week gestation pregnancy with a fetus in breech presentation, complicated by polyhydramnios and multiple congenital anomalies (micrognathia, hypotelorism, low set ear, bilateral club hand with clenched hand, and bilateral club foot) suspicious for an underlying trisomy. The breech presentation itself is considered a potential marker for congenital anomalies.This case highlights the critical dilemmas in diagnostic procedures, delivery management, and patient counseling within a developing country's healthcare system. Therefore, this study aims to report a case of severe multiple congenital anomalies and discuss the associated challenges in diagnosis, management, and counseling.

## CASE ILLUSTRATIONS

This following case was described according to the CARE checklist. A-22 years old G1P0A0 felt 8 months pregnant came to obstetrics and gynecology ward for pregnancy control. The patient acknowledged complaints of labor pain that became more frequent and stronger started from one day before admission accompanied by bloody show. Complaints of profuse discharge from the birth canal were denied. Fetal movement was still felt by the mother. The mother discovered abnormalities in her fetus during antenatal care at 27 weeks of gestation. However, history of congenital abnormalities in her family was denied. History of consuming herbal medicines or drugs during pregnancy was denied. She had a history of living around the industrial area (garment factory) less than 50 meters away. The patient denied a history of chronic diseases such as high blood pressure, diabetes, heart disease and asthma. She also denied any history of contact with Covid-19 patients, history of fever, cough, runny nose and sore throat. She had already vaccinated three times with Sinovac.

Physical examination revealed a normal result. External obstetric examination showed gestational age based on fundal height was the same as gestational age based on her last menstrual period with breech fetal position. Her uterus was not contracted adequately and her fetal heart rate detected. Initial laboratory findings on admission were within normal limits for a patient in labor, with a hemoglobin level of 14.4 g/dL, a leukocyte count of 14,540/µL, and a platelet count of 279,000/µL. Cardiotocography (CTG) monitoring revealed a baseline fetal heart rate of 140-150 beats per minute (bpm), moderate variability, and the presence of accelerations, with no decelerations. The tracing was classified as a Category I fetal heart rate pattern.

Maternal-Fetal ultrasonography (18/12/2023) or about 8 weeks before admission, demonstrated a single intrauterine alive fetus, in breech position; according 27-28 gestational weeks ($27^{+3}$ weeks), estimated fetal weight (EFW) of 1041 grams (percentile <1%), fetal heart rate (+) ; Face: nasal bone (+), Nostril (+), Cleft (-), micrognathia (+), hypotelorism (+) (5th percentile 1.8 cm); Thorax: four-chamber view (4CV) findings were within normal limits; CTAR 15%, Axis 49.66 degrees; Abdomen: Minimally filled stomach, normal filled urinary bladder; both kidneys are visualized normally; Amniotic fluid with single deepest pocket (SDP) 11.69 cm. The placenta was inserted posteriorly and extends laterally. Notably, a hypoechoic clear zone measuring 2.25 cm x 1.36 cm was identified at the umbilicus. This finding raised suspicion of a ventral wall defect such as an omphalocele, which further added to the diagnostic complexity of the case. Superior extremity: HL, radius and ulna corresponding 26-27 weeks, bilateral club hands (+), clenched hands (+); Inferior extremities: bilateral club feet with suspected bilateral rocker bottom feet. From velocimetry doppler findings, umbilical artery pulsatile index 1.15 S/D 3.34; middle cerebral artery pulsatile index (MCA PI 1.34 S/D 3.47); right uterine artery pulsatile index 1.37: left uterine artery pulsatile index 0.77 with notching -/-. Ductus venosus revealed normal flow. All these findings suggest a pregnancy of 28-29 gestational weeks (18/12/23) and 35-36 weeks at current admission; breech position; polyhydramnios with multiple congenital anomalies (micrognathia, hypotelorism, low set ear, club hand bilateral with clenched hand,

club foot bilateral); arthrogryposis suspect of trisomy **(Figure 1)**. For diagnostic purpose, the patient was suggested for amniocentesis after a scheduled multidisciplinary consultation for congenital anomalies at Hasan Sadikin General Hospital, but the patient's family refused.

Vaginal delivery was planned for this patient along with closed and regular monitoring of vital sign, uterine contraction, fetal heart rate, and labor progress. Prompt informed consent to the patient and her family regarding fetal death was performed on this patient. The following day after admission, a female baby was born with spontaneous bracht vaginal delivery with birth weight of 1514 grams and body length of 30 cm; APGAR 1 minutes and APGAR 5 minutes were 3 and 5. New Ballard Score (NBS) could not be calculated. The patient was observed for 6 hours post-partum with a good general and obstetric condition, vital sign, and no complications were found. She was discharged afterwards and was planned for outpatient treatment and given medication therapy of cefadroxil 500 mg twice daily and mefenamic acid three times a day. However, her baby was admitted to High Care Unit (HCU) installed with C-PAP (continuous positive airway pressure) as shown in **Figure 2**. During monitoring, desaturation occurred up to 25% along with increased respiratory distress increases, cyanosis in the hands and feet area with no thermolability. After her family decided to remain DNR (do not resuscitate), the patient's baby died due to respiratory failure and bradycardia as consequences of multiple congenital anomalies.

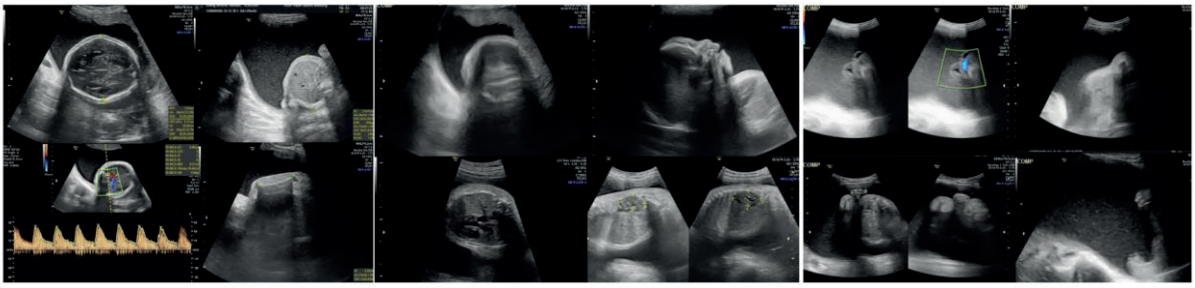

**Figure 1.** Maternal-Fetal Ultrasound of This Patient Revealed Multiple Congenital Anomalies.

**Figure 2.** Patient's Newborn with Multiple Congenital Anomalies (micrognathia, hypotelorism, low set ear, club hand bilateral with clenched hand, club foot bilateral); arthrogryposis suspect of trisomy

## DISCUSSIONS

*Prenatal Screening Test*

At least 2% of fetuses and newborns are known to have severe congenital malformations[3-7], which significantly affect perinatal and infant mortality as well as morbidity during infancy and childhood. Over the last few decades, ultrasonography studies have been used to detect a growing variety of congenital abnormalities during pregnancy. Prenatal diagnosis serves a number of functions, including improving the likelihood of optimum pregnancy management in terms of prenatal care, referring expectant mothers to the appropriate level of care, and organizing the baby's postnatal care.7 There have been attempts to correct several fetal abnormalities intrauterine, but the outcomes have been unsatisfactory thus far.[3-7]

At first, in this case, the patient had a child with congenital abnormalities with environmental risk factors (living close to a garment factory). Previous meta-analysis study revealed that the offspring's neural tube defects (OR: 1.51, 95% CI: 1.09–2.09) and congenital heart diseases (OR: 1.31, 95% CI: 1.06–1.63) were linked to the mother's occupational exposure to solvents such as products from garment factory.8 Maternal exposure to chemicals at work before and throughout pregnancy is a significant environmental risk that has been linked to the development of congenital abnormalities. Studies that have looked at occupational exposure of mothers have mostly examined exposure to metals, pesticides, and solvents. There are a number of unfavorable reproductive outcomes linked to exposure to these chemicals. This is significant since the first month of pregnancy to the end of the first trimester is when most congenital abnormalities arise. Maternal oocytes are susceptible to chemical exposure in the month preceding conception. Chemical exposure during the first trimester of pregnancy can have an impact on the developing embryo. After this point, organogenesis is finished and and the fetus is less susceptible to chemical exposure for development.[8]

Since Non-Invasive Prenatal Testing (NIPT) was first used in a therapeutic context, there has been disagreement over the most effective way to integrate it into standard prenatal care. NIPT is optional, just like all other prenatal screening tests, and it can be carried out as early as 9 to 10 weeks of pregnancy and all the way up to term. Furthermore, depending on their insurance company, patients may have to pay for this more costly test out of cash. Massive parallel shotgun sequencing advances in genomics produced NIPT, a screen that detects cell-free fetal DNA sequences that originate in placental cells and are present in maternal blood.[9-11] In the first prospective trials, trisomy 21 was detected with 100% sensitivity and more than 99% specificity in high-risk women who underwent NIPT testing.[10] Numerous studies have consistently shown that while NIPT is quite accurate in detecting trisomies 21 and 18 but not trisomy 13 such as to confirm trisomy in this case. Posttest counseling is strongly advised for patients who receive a screen-positive result. A medical geneticist or certified genetics counselor may be consulted to discuss the necessity of prenatal diagnostic testing, such as chorionic villus sampling (CVS) or amniocentesis, or postnatal genetic testing to confirm the diagnosis. Chromosomal aberrations may be detected with a sensitivity of 99.2% (95% CI 98.9–99.6%) and a specificity of 98.5–98.8% (95% CI) using CVS and a sensitivity of 98.8% with specificity of 99.96% using amniocentesis.[12]

Every screening test that has been covered up to this point advises invasive diagnostic testing by CVS or amniocentesis in the event that abnormal results arise. However, amniocentesis takes place in the second trimester.[14] A transcervical (the more usual method) or transabdominal approach is used to extract chorionic villi cells from the placenta during CVS, which takes place between 10 and 13 weeks of gestation and is guided by ultrasound technology. During the 14–20 gestational weeks period, amniocentesis is a technique that uses ultrasound guidance to insert a needle into the amniotic sac and extract amniotic fluid. Since the amniotic fluid includes fetal cells, it can be utilized for karyotyping and genetic testing.[14]

From traditional cytogenetic analysis to next-generation sequencing (NGS), which can detect pathogenic variations from the whole human exome or genome, genetic testing techniques have advanced dramatically.[14] Genetic testing is offered at various research-based institutes in developing countries such in Indonesia, however its availability differs throughout nations. Other obstacles include a lack of knowledge among the public and health professionals, the medical genetic infrastructure—which includes legal frameworks, professional recognition, and

regulations—the limitation of national health insurance coverage, the minimum level of government support, and a lack of interest in and expertise in genetic disease research.[15]

In contrast to genetic testing, anatomical scanning by ultrasound in the second trimester has an approximate detection rate of 60%, albeit this might vary greatly depending on the ultrasonographer's skill, the woman's body mass index (BMI), the patient population in the research, and the severity of the abnormality. After a normal NIPT result, a genetic sonogram is not advised due to its poor performance in comparison to the NIPT. The degree of suspicion for both significant and small defects, as well as the criteria for anatomical scanning, will probably change if NIPT is included into standard prenatal treatment. A thorough anatomy scan is an essential component of standard prenatal care, even though a normal NIPT could be comforting in its own right.[13-15]

Thus, there is still opportunity for NIPT in this instance, which is followed by amniocentesis (during the third trimester) to confirm trisomy in severe cases of multiple congenital anomalies. Amniocentesis and genetic testing with NIPT are also advised as complementary procedures for these individuals, since the research suggests that their diagnostic value outweighs that of sonographic evaluation alone. However, cost, insurance, and the patient's socioeconomic condition also required to be considered.

*Delivery Options in Fetus with Severe Congenital Anomalies in Breech Position*

The baby of this patient also experienced multiple congenital anomalies in the breech position and was born via spontaneous bracht vaginal delivery. According to previous study, when compared to the cephalic presentation (3.7%), the frequency of congenital abnormalities in breech babies was twice as high (6.5%).[16] A congenital abnormality may be indicated by breech presentation at birth. Breech babies need to be examined closely in case there is any deformity. Pregnant women who have a cesarean birth are often at higher risk for infection, hemorrhage, organ damage, and particularly for infections in subsequent pregnancies. On the other hand, a cesarean delivery can also help with scheduling and support planned surgery, such as the ex-utero intrapartum therapy (EXIT) method, and lower the risk of birth damage to the fetus with specific deformities.[23] Therefore, in situations of fetal abnormalities, the advantages of a caesarean birth must be carefully considered against the possible disadvantages to the mother and should be conducted due to obstetrics indications only. Maternal risks are typically lower with an uncomplicated vaginal delivery than with a cesarean delivery.[16] Moreover, there are no previous studies that specifically mentioned the survival rate of vaginal delivery in the birth of fetuses with congenital abnormalities, especially in breech position, but a registry study shows that congenital abnormalities increase admission to the neonatal intensive care unit (NICU) or perinatal death of neonate in the labor room (LR) or operation theater (OT) with OR 34.03; 95% CI 20.51–56.46) with less mortality cases occur in labor room with vaginal delivery.[17]

Vaginal delivery in breech cases with congenital abnormalities can be carried out like vaginal delivery in breech cases in general which are: 1) Spontaneous labor (spontaneous breech) in which the baby is born with the mother's own energy. This method is commonly known as spontaneous Bracht method. 2) Manual aid (partial breech extractions; assisted breech delivery) The fetus is born partly with the energy and strength of the mother and some with helpers. 3) Breech extraction (total breech extraction) The fetus is born entirely using helper power.[16] In this patient, the baby was planned for vaginal delivery because there was no obstetrical indication to do caesarean section. Thus, vaginal delivery with spontaneous bracht was performed in this patient.

*Genetic Counseling*

Trisomy such in this case has been extensively researched since it is the most prevalent genetic condition in the human population. Multiple incidences of trisomy including Trisomy 21 (T21) may be detected, despite the fact that the estimated recurrence risk for trisomy in 1-2% cases.[3] Currently, the study of European amniocenteses gathered in the 1980s (Stene et al. 1984; reanalyzed by Warburton et al. [1987]) is the most common basis for genetic counseling on trisomy recurrence. Regarding trisomy 21, these data indicated that the risk of recurrence was about eight times the maternal age-associated risk for women under 30 at the time of prenatal diagnosis, whereas for women whose first trisomy occurred at age ≤30. This recurrence risk has been

explained by a number of theories, including gonadal mosaicism in the parents, age-related risk in the mother, and genetic susceptibility to nondisjunction.[3] The most plausible mechanism linked to repeated homotrisomy in the same relationship is gonadal mosaicism, particularly, and parental mosaicism, the mechanism that is most commonly described. Age-related maternal risk is assumed to be the cause of most of the remaining instances. Mosaicism is a significant factor in recurrent Trisomy, thus families who desire to obtain prenatal counseling and have several afflicted children should be suspicious of this condition.[3,19]

Rarely is gonadal trisomy 21 mosaicism explicitly documented since ovarian biopsies or germ cells are required. The percentage of mosaic cells, the tissues examined, and the quantity of cells counted would all be factors in the diagnosis of somatic mosaicism. It is advised to look for the trisomic line in at least two distinct tissue samples if mosaicism is suspected. When compared to blood-derived DNA, oral mucosa cells offer a better diagnostic yield in a noninvasive manner. It is thought that fetal oogonial/oocyte Trisomy mosaicism is the most likely cause of younger women's higher recurrence risk.[3,19]

As demonstrated in our example, there is currently only one method available for the identification of low-level/cryptic mosaicism, which involves using fluorescence in situ hybridization (FISH) technology with chromosome-specific probes on large cell populations from various tissue samples.[19] It is possible that low-level mosaicism went undetected and that the aborted fetus with mild down syndrome phenotypic characteristics was underdiagnosed based on the traditional G-banding study performed to evaluate the karyotype. It is advised to do a comprehensive cytogenetic analysis of both parents.[19,20]

The elevated recurrence risk brought on by the potential presence of undiagnosed parental mosaicism for Trisomy should be taken into consideration in genetic counseling. Gonadal mosaicism, which is usually of maternal origin, is a significant cause of recurrent Trisomy 21 and should be highly suspected in families where more than one child is afflicted. Despite living in the era of molecular diagnostics and high-resolution instruments, it is important to remember that the degree of mosaicism affects data interpretation and might result in incorrect diagnoses. Because low-level mosaicism may go undetected by traditional cytogenetic testing, FISH analysis in a large number of cells in various tissue samples, such as blood and oral mucosa cell, is essential for detecting it and is a major prognostic factor.[19,20] However lack of knowledge among the public and health professionals, lack of the medical genetic infrastructure—which includes legal frameworks, professional recognition, and regulations—the limitation of national health insurance coverage, the minimum level of government support, and a lack of interest in and expertise in genetic disease research are some obstacles of genetic testing have to be faced in Indonesia.[15] This issues become dilemmatic considering that according to Law No. 36 of 2009 regarding Health in Indonesia article 72, obtaining correct and accountable information, education and counseling regarding reproductive health is the right of every citizen. However, health insurance in Indonesia does not cover genetic examination and counseling. In fact, if genetic disorders could be screened earlier, termination can be carried out before the pregnancy reaches six weeks old (article 75 and article 76), calculated from the first day of the last menstrual period and performed by certified health workers who have the authority, determined by the minister.[21] In developing countries such as Indonesia, apart from the problem of limited funding which is not covered by health insurance, this one becomes as ethical issue related to termination of pregnancy if congenital abnormalities are detected at more than 6 weeks of age such found in this case.

The primary strength of this case report lies in its comprehensive illustration of the multifaceted dilemmas—diagnostic, management, and counseling—faced in a low-resource setting when managing a rare combination of multiple congenital anomalies with breech presentation. This report provides valuable real-world insights for clinicians in similar developing countries. However, this study has several limitations. First, as a single case report, the findings cannot be generalized. Second, a definitive genetic diagnosis could not be established as the family refused invasive testing like amniocentesis. Lastly, complete laboratory and cardiotocography data were not available due to the emergency nature of the admission, which could have provided additional clinical information.

## CONCLUSIONS

In severe situations of multiple congenital

anomalies, NIPT could be performed, followed by CVS or Amniocentesis (based on patient's gestational weeks) to confirm trisomy, especially when combined with sonography findings. The method of delivering a breech patient in cases of multiple congenital anomalies could be carried out based on obstetric considerations and in this case spontaneous bracht delivery is appropriate due to survival rate of the baby. Genetic counseling is necessary in these patients given the recurrence rate in subsequent pregnancies, however, the importance in developing country is still debated.

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