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Prenatal diagnosis of parasitic twins using three-dimensional ultrasound: a case report

A. TAN* and S.-L. LEE*

**Department of Obstetrics and Gynaecology, Singapore General Hospital, Republic of Singapore*

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ABSTRACT

Parasitic twins are a rare form of monochorionic, monoamniotic conjoined twins. Early prenatal ultrasound is essential for their diagnosis and assists in determining their eventual outcome; the use of three-dimensional ultrasound may enhance diagnostic capabilities in the presence of this severe condition.

INTRODUCTION

Parasitic twins are a form of conjoined twins[1]. Conjoined twins are monozygotic twins which are both monochorionic and monoamniotic[2–4]. With two-dimensional (2D) ultrasound, the chorionicity of the placenta as well as the presence of a dividing membrane can easily be determined in the first trimester[5]. With the application of the multiplanar capability of three-dimensional (3D) ultrasound, we were able to obtain different views of a case of parasitic twinning, enabling an enhanced appreciation of the spatial arrangement of the fetal parts and without the need for an extended scanning time. The 3D images that were obtained gave an accurate depiction of the anomaly, thereby playing an important role in the counseling and management of the patient.

CASE REPORT

A 19-year-old Malay woman, gravida 1 para 0, was first seen in our department on 7 July 2000. She was a single mother and a person of simple mentality. She claimed to have only discovered her pregnancy at a presumptive 34 weeks' gestation. Examination by 2D ultrasound demonstrated a male fetus with biometry consistent with 27 weeks' gestation. Extrafetal tissue was seen extruding from the upper abdomen, consisting of a pair of upper and a pair of lower limbs with no demonstrable head or heart. The extrafetal tissue was much smaller than that of the autosite. These findings were suggestive of parasitic twins. The stomach bubble of the autosite was not identified. Male genitalia were noted on both the extrafetal tissue and the autosite. The autosite was also noted to have moderate hydrocephalus.

Fetal echocardiography revealed a large, totally anomalous heart, which spanned across the chest region of the autosite into the extrafetal tissue. There appeared to be a large atrioventricular septal defect but the outflow tracts were indistinguishable. These findings were suggestive of conjoined twins.

Three-dimensional ultrasound (Voluson 530D, Medison-Kretztechnik, Linz, Austria) was performed to confirm the provisional diagnosis. It clearly demonstrated the extrafetal body with two upper and two lower limbs attached at the level of the chest above the umbilical cord insertion of the autosite (Figure 1).

Following counseling, amniocentesis was performed and the karyotype was found to be 46,XY. Despite the normal karyotype, the family was counseled as to the likely lethal nature of the anomaly and they opted for a termination of the pregnancy. However, the Ministry of Health did not support the application for late termination of pregnancy.

The patient was admitted in premature labor at 34 weeks' gestation and a lower segment Cesarean section was performed to avoid an obstructed vaginal delivery. The Apgar scores were 1 and 1 at 1 min and 5 min, respectively. The baby expired spontaneously at 1 h of life.

Postnatal findings confirmed asymmetrical conjoined twins (Figure 2) and the presence of a single placenta. Extrafetal tissue with a pair of upper and a pair of lower limbs was seen extruding from the fetal chest. At birth, an extra pair of ears was observed on the neck of the autosite. These could be seen retrospectively on the 3D ultrasound images. The findings were consistent with parasitic conjoined twins. The patient declined an autopsy for religious reasons.

DISCUSSION

Monochorionic, monoamniotic twins account for only 1–2% of monozygotic twinning. They are formed by the division of the embryonal disc after differentiation of the

Correspondence: Dr A. Tan, Department of Obstetrics and Gynaecology, Singapore General Hospital, Outram Road, Singapore 169608, Republic of Singapore (e-mail: pinann@mbox4.singnet.com.sg)

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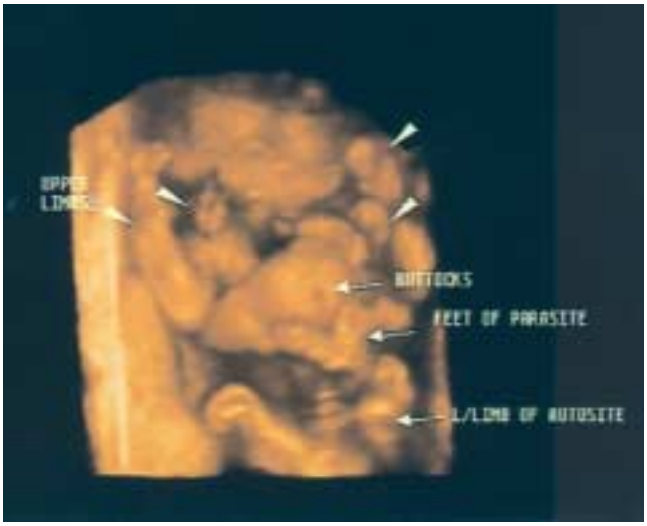

Figure 1 Three-dimensional ultrasound image of the parasitic conjoined twins showing the extrafetal body attached at the level of the chest above the umbilical cord insertion of the autosite. Arrowheads.

Figure 2 Postnatal photograph of the parasitic twins.

amnion, which occurs at 7–13.5 days of development[2,3]. Approximately 4–5% of monochorionic, monoamniotic twins are conjoined. This is equal to nearly 1 in 2500 monozygotic pairs. Conjoined twins originate by the incomplete splitting of the embryonic disc at 13.5–15 days of gestation. It is thought that they result from the secondary union of two originally separate monovular embryonic discs. Conjoined twins are always joined at identical anatomical points and are classified according to the site of union: approximately 40% are joined at the chest (thoracopagus), approximately 34% at the anterior abdominal wall (xiphopagus or omphalopagus), approximately 18% at the buttocks (pygopagus), approximately 6% at the ischium (ischiopagus), and approximately 2% at the head (craniopagus). A combination of these types of fusion has also been reported[6].

Two rarer forms of conjoined twins are parasitic twins which are asymmetrically conjoined, one being smaller, less well developed and dependent upon the other, and fetus *in fetu*, in which an imperfect fetus is contained completely within the body of its sibling.

In our case, the autosite and parasite were clearly demonstrated on the 3D image, enabling an accurate depiction of the condition and the extent of the anomalies to be recorded. Following discussion amongst members of the unit's birth-defect team, the prognosis was deemed to be extremely poor and management was tailored accordingly. In cases for which separation is considered, color Doppler studies should be performed in order to assess the vascular connections[7].

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