

Ultrafast magnetic resonance imaging of omphalopagus conjoined twins

Omphalopagus yapışık ikizlerde ultrafast manyetik rezonans görüntüleme

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Abstract

Conjoined twins are extremely rare congenital malformations. Omphalopagus twins are the second most common variety of conjoined twins and usually are joined at the umbilicus. Herein, we present ultrafast magnetic resonance imaging (MRI) feature of this rare anomaly at 24 weeks of gestation. Ultrafast MRI can provide additional information that may help ultrasonography for antenatal characterization of such anomalies.

Keywords: Conjoined twins; omphalopagus; ultrafast MR imaging

Özet

Yapışık ikizler oldukça nadir karşılaşılan konjenital malformasyonlardır. Omphalopagus yapışık ikizler bunların arasında ikinci sık karşılaşılan formdur ve yapışıklık genellikle umbilikal düzeydedir. Biz burada 24 haftalık gebelikte karşımıza çıkan bu nadir anomalinin hızlı sekans (ultrafast) manyetik rezonans görüntüleme (MRG) bulgularını sunmayı amaçladık. Ultrafast MRG bu tür anomalilerin antenatal karakterizasyonunda ek bilgiler sağlayarak ultrasonografiye yardımcı olabilmektedir.

Anahtar kelimeler: Yapışık ikizler; omphalopagus; ultrafast MRG

Introduction

Conjoined twinning is a very rare abnormality with an approximate incidence of about 1 in 50,000 pregnancies, but around 60% of them are stillborns, giving an overall true incidence of about 1 in 125,000 live births with a male-female ratio of 1:3 (1). The phenomenon occurs between the 13th and 15th day after fertilization, when there is a failure in splitting it leads to conjoined twins. It has been proposed that secondary fusion of two originally separate monovular embryos may result twinning (2). Twins are classified according to the major site of union, with the suffix pagus meaning fixed or fastened. Omphalopagus twins are the second most common variety, usually joined at the umbilical region (3). Ultrasound (US) is widely used for the diagnosis of conjoined twins. However, MRI is the best modality to provide detailed imaging of fetuses with complex anomalies. Ultrafast MR imaging provides image acquisition within seconds and does not require sedation. We present a case of omphalopagus conjoined twins evaluated by ultrafast MRI sequences.

Case

The patient was an 19 year-old gravida 1 para 0 woman with a twin pregnancy at 24-week gestation was admitted to the outpatient clinic of obstetrics and gynecology department with the suspicion of fetal anomaly which was diagnosed by an obstetrician and gynecology specialist. An obstetric ultrasonography was performed. Two heads were visualized. However the other parts of the body were not shown specifically by the US because of the advanced gestational age. MRI

was planned in order to make a clear diagnosis of conjoined twinning.

MR examination was performed in a 1.5T superconductive unit, with a synergy body coil (Intera Master, Philips Medical Systems). Balance turbo-field-echo (TR/TE/FA/scan time: 3.0/1.5/80/25.2 sec-breathhold) images in the axial plain, and single-shot T2 weighted images (free-breath) (831/80/80/20.8 sec) in the axial and coronal plain were obtained. The conjoined twins were visualized successfully as joined through the mid-abdomen with a common liver located outside like omphalocele (Figure 1). The fetuses had 2 separate chests, kidneys, and urinary bladders. There was partial fusion of some abdominal structures which were difficult to characterize. Gestation was terminated with intravaginal misoprostol 400 µg (Cytotec®) because of poor prognosis.

Discussion

Conjoined twins result from a separation defect in the embryonic plaque between the 13th and 17th days of gestation. They are monozygotic, monoamniotic, and monochorionic, and are classified according to the site of fusion: thoracopagus (thorax), omphalopagus (abdomen), pygopagus (sacrum), ischiopagus (pelvis), craniopagus (face) or rachipagus (back).

Omphalopagus twins account for 18–33% of all conjoined twins. They are usually joined in the front at the level of the umbilicus, commonly involving the lower thorax (3). Liver fusion occurs in 80% of cases (4). The pericardium may be common, but the heart is never shared (5).

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Antenatal diagnosis of typical conjoined twins is easily made by means of ultrasonography even during the first trimester (6). It allows direct, real-time examination. Accurate diagnosis of congenital anomalies, such as conjoined twins, and details as degree of fusion can be done. Prenatal diagnosis of shared organs is of great importance for the consideration of possible surgical separation or termination of pregnancy (7). However, maternal obesity, oligohydroamnios, and engagement of fetal head in late pregnancy can diminish the imaging quality of US (8).



Figure 1. Coronal single-shot fast spin echo image of the omphalopagus conjoined twins shows common liver located outside the abdomen (arrow).

In such cases, MRI is superior to US for overall fetal assessment. MRI, with its ability to differentiate soft tissues, provides an excellent alternative technique.

The recent popularity of prenatal MRI has been attributed to the development of ultrafast MRI techniques such as the single-shot fast spin-echo sequence, in which one sequential high-resolution heavy T2-weighted images can be obtained in 2 sec. This sequence significantly reduces motion artifact and allows high-quality images of fetal organs without the need for fetal or maternal sedation (9,10).

Herein, we presented a case of omphalopagus conjoined twins, and ultrafast MRI can be a perfect complementary of US in such cases which was difficult to characterize the conjoined abdominal structures.

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