

# Antenatal Diagnosis of Ethmoidal Encephalocele in a Monochorionic Diamniotic Twin Pregnancy: The Role of Three-dimensional Ultrasound with Crystal Vue Rendering Mode

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Dear Editor,

Twenty-nine-year-old pregnant woman, primipara, with no morbid personal and family history. First trimester scan showed a monochorionic diamniotic twin pregnancy, fetuses with normal aneuploidies markers, and 5 mm difference of crown-rump length between the fetuses. Ultrasound examination performed at 16 + 4 weeks of pregnancy observed in one of the fetuses a protrusion in the interorbital region of the face [Figure S1]. Two-dimensional ultrasound showed a discontinuity at the skull base bone with externalization of the brain tissue with suspicious of ethmoidal. A second trimester scan performed at 21 + 4 weeks of pregnancy using three-dimensional (3D) with Crystal Vue rendering mode (Samsung Co., Seoul, South Korea) confirmed the diagnosis of ethmoidal encephalocele allowing better parental counseling and the understanding of fetal pathology by the multidisciplinary team [Figure 1]. Fetal magnetic resonance imaging in T2 weight also confirmed the diagnosis of ethmoidal encephalocele [Figure S2]. Cervical length by transvaginal ultrasound showed short cervix (20 mm) with sludge. Despite procedures to prevent preterm labor (vaginal progesterone), spontaneous delivery occurred at 23 weeks. Both fetuses died due to early gestational age. Anatomopathological examination confirmed the diagnoses of ethmoidal encephalocele [Figure 2].

Encephalocele is a cranial defect along bony sutures in which there is a herniation of the brain and/or meninges. Its incidence ranges from 1 per 3500 to 1 per 5000 live births.<sup>[1]</sup> It may involve any regions of the fetal skull and prognosis depends on the encephalocele location and size and presence of associated



**Figure 1:** Three-dimensional ultrasound using the Crystal Vue rendering mode at 21 + 4 weeks of pregnancy in sagittal view (a and b). Note the ethmoidal encephalocele (arrows)

anomalies. Ethmoidal encephalocele is rare type of this group of malformations whose defect involves the skull base bone.<sup>[2]</sup>

3D ultrasound is an important tool in obstetrics. 3D technologies can provide additional information regarding

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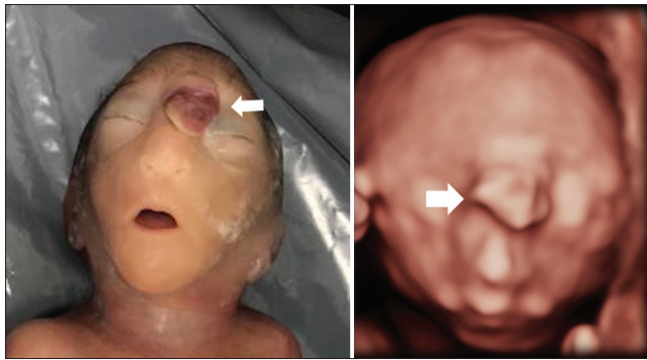
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**Figure 2:** Comparison between anatomopathological (right) and three-dimensional Crystal Vue rendering mode (left) of fetus with ethmoidal encephalocele (arrows)

diagnosis of several malformations, including fetal facial, skull, and brain anomalies. Crystal Vue is a new rendering technology based on image-contrast enhancement which has proven to be potentially effective in differentiating between soft tissue and bony structures.<sup>[3]</sup> The authors have shown that Crystal Vue technique has proved to be an important tool for the evaluation of fetal anomalies, including facial defects, such as palate clefts, and skeleton malformation.<sup>[3,4]</sup> In our case, Crystal Vue rendering mode was fundamental to the early diagnosis of ethmoidal encephalocele. In fact, to characterize the defect and to confirm the diagnosis as soon as possible are important aspects for the parents' counseling to

define prognosis and follow-up. To the best of our knowledge, this is the first reporting of prenatal diagnosis of ethmoidal encephalocele by 3D ultrasound using Crystal Vue rendering mode.

### Declaration of patient consent

The authors certify that they have obtained appropriate patient consent form. In the form, the patient has given her consent for the images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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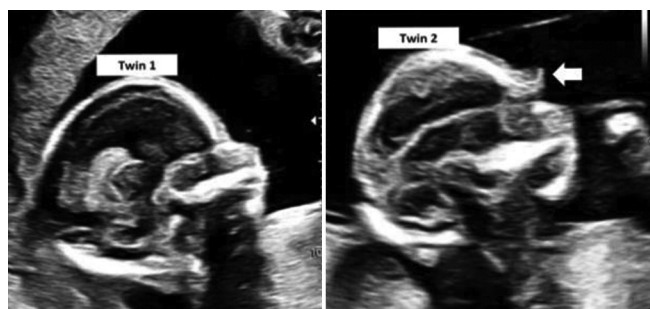
Nil.

### Conflicts of interest

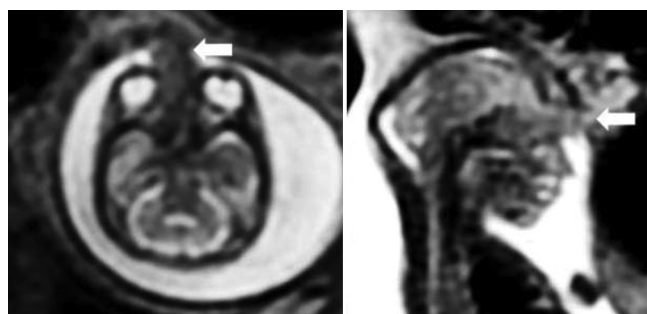
There are no conflicts of interest.

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**Figure S1:** Two-dimensional ultrasound at 16 + 4 weeks of pregnancy of a monozygotic diamniotic twin showing the sagittal view of both fetuses. Note the ethmoidal encephalocele in twin 2 (arrow)



**Figure S2:** Fetal magnetic resonance imaging at 21 + 4 weeks of pregnancy in T2-weight in axial and sagittal views showing the ethmoidal encephalocele (arrows)