HDLive Silhouette for Antenatal Diagnosis of Uterine Synechia

¹Ayumi Mori, ²Megumi Ito, ³Nobuhiro Mori, ⁴Kenji Kanenishi, ⁵Hirokazu Tanaka, ⁶Toshiyuki Hata

ABSTRACT

We present our experience of using HDlive studio and HDlive silhouette to diagnose uterine synechia at 18 weeks and 2 days of gestation. Two-dimensional (2D) sonography showed a narrow, transverse uterine synechia in the amniotic cavity. 2D color Doppler revealed arterial blood flow consistent with the maternal heart rate in the uterine synechia. HDlive silhouette clearly demonstrated a transverse, bridging uterine synechia in front of the fetal head, and fetal arm and leg behind the placenta. Magnetic resonance imaging (MRI) confirmed the oblique horizontal band-like synechia at 31 weeks of gestation. HDlive silhouette and HDlive studio provided a novel visual depiction of uterine synechia and allowed us to demonstrate the spatial relationships among the uterine synechia, placenta, umbilical cord, and fetus in the amniotic cavity.

Keywords: Antenatal diagnosis, HDlive silhouette, HDlive studio, Pregnancy, Uterine synechia.

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INTRODUCTION

Three-dimensional (3D) ultrasound clarifies the spatial relationships of uterine synechia in the amniotic cavity during pregnancy, which is not achievable with 2D sonography.^{1,2} Moreover, HDlive provides more realistic images of uterine synechia, compared with conventional 3D ultrasound.^{3,4} HDlive silhouette provides vitreous-like clarity of the fetus and placenta and allows the examiner to observe structures present behind the directly visualized structure, making it more advantageous than conventional 3D ultrasound and HDlive.⁵⁻⁹ Here, we present our experience of using HDlive studio and HDlive silhouette to diagnose uterine synechia.

CASE REPORT

A 37-year-old pregnant Japanese woman, gravida 5, para 0, was referred to our ultrasound clinic due to suspected amniotic band syndrome at 18 weeks and 2 days of gestation. 2D sonography showed a narrow, transverse uterine synechia in the amniotic cavity (Fig. 1). 2D color Doppler revealed an arterial blood flow consistent with the maternal heart rate in the uterine synechia. HDlive studio showed a transverse uterine synechia in front of the fetal head in the amniotic cavity (Fig. 2A). HDlive silhouette demonstrated a transverse, bridging uterine synechia in front of the fetal head (Fig. 2B), and fetal arm and leg behind the placenta (Fig. 2C). MRI confirmed the oblique horizontal band-like synechia at 31 weeks of gestation (Fig. 3).

Elective cesarean section was performed at 38 weeks and 3 days of gestation because of the difficulty of vaginal delivery due to fetal malpresentation, and a male infant weighing 2,936 g was delivered with an umbilical artery pH of 7.324, and Apgar score of 8/9 at 1 minute and 5 minutes, respectively. The transverse, bridging synechia was confirmed during the operation (Fig. 4) and was resected. The mother and neonate followed favorable courses after delivery.

DISCUSSION

The incidence of uterine synechiae is 0.45%, and they are correlated with a significant increase in the risk of preterm

Fig. 1: Two-dimensional sonographic image of a narrow, transverse uterine synechia (arrow) at 18 weeks and 2 days of gestation. P, placenta.

¹Resident, ²Assistant Professor, ³Lecturer, ^{4,5}Associate Professor, ⁶Professor and Chairman

¹⁻⁶Department of Perinatology and Gynecology, Kagawa University Graduate School of Medicine, Japan

Corresponding Author: Toshiyuki Hata, Professor and Chairman, Department of Perinatology and Gynecology, Kagawa University Graduate School of Medicine, Japan, Phone: +81-(0)87-891-2174, e-mail: toshi28@med.kagawa-u.ac.jp

Figs 2A to C: HDlive studio and HDlive silhouette images of uterine synechia (*) at 18 weeks and 2 days of gestation. (A) HDlive studio shows a transverse uterine synechia in front of the fetal head in the amniotic cavity; (B) HDlive silhouette demonstrates a transverse, bridging uterine synechia in front of the fetal head; and (C) fetal arm and leg behind the placenta. FH, fetal head; P, placenta

Fig. 3: Sagittal T2-weighted MR image of uterine synechia at 31 weeks of gestation. MRI confirms the oblique horizontal band-like synechia (arrow). P, placenta

Fig. 4: The transverse, bridging synechia (arrow) confirmed during the operation.

premature rupture of membranes, placental abruption, and cesarean delivery due to malpresentation.¹⁰ Therefore, a precise diagnosis of uterine synechia is mandatory for comprehensive perinatal management of a patient.

The placental shelf rarely persists to mid-gestation, but never to the third trimester.^{11,12} It is not attached to any fetal parts, and there is no fetal abnormality. 3D ultrasound and HDlive clearly show its characteristic features such as smooth, round, and thick free edges.^{3,12} In utero, fetal malformations with fibrous bands that wrap around parts of the fetus are collectively called amniotic band syndrome.¹³ Using 3D ultrasound and HDlive, the continuity, extension, and motion of amniotic bands could be more easily clarified, and spatial relationships between the amniotic bands and fetus could be more readily understood compared with using conventional 2D sonography.¹⁴⁻¹⁷ During pregnancy, amniotic shelves or sheets are produced by the wrapping of chorioamniotic

membranes around intrauterine adhesions called as uterine synechiae.^{10,18,19} The use of pulsed Doppler with the maternal heart rate reveals this etiology, and the synechiae can be fully observed using 3D ultrasound and HDlive.¹⁻⁴ Moreover, those modalities enable us to realize the spatial relationships among the uterine synechia, placenta, umbilical cord, and fetus. In the present case, HDlive silhouette demonstrated a transverse, bridging uterine synechia in front of the fetal head, and fetal arm and leg behind the placenta. Therefore, this technique provides holography-like information on overlapping structures in the amniotic cavity.

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