The acardiac fetus

Before exposure

After exposure

The acardiac fetus

Objectives: To clinically evaluate high-intensity focused ultrasound (HIFU) for fetal therapy of the twin-reversed arterial perfusion (TRAP) sequence.

Methods: Six patients underwent HIFU therapy: five patients during the first trimester and one patient during the second trimester. In this study, two types of HIFU systems were used. The first-generation HIFU system comprised a biaxial transducer and continuous exposure pattern. The second-generation HIFU system comprised a coaxial transducer and sequential exposure pattern. The first-generation apparatus was used for four cases and the second-generation apparatus was used for two cases.

Results: For three patients, blood vessels to the acardiac twin had been occluded. Two patients resulted in intrauterine fetal demise despite vessel occlusion. The total fetal survival rate was 67%, and the efficiency rate was 83% after HIFU therapy. After more than 2 years of follow-up, the surviving infants had no severe clinical complications and no postnatal development problems. There was no significant difference in survival rates. However, owing to its efficiency rate, HIFU therapy is beneficial and can reduce the cardiac load of the pump fetus.

Conclusions: HIFU does not require uterine puncture for fetal therapy. In this study, there were no fatal complications, such as bleeding, rupture of membranes, and infection. HIFU therapy might be one of the method for TRAP sequence treatment in early pregnancy.