A study of the spatial relationship between cardiac chambers in the fetal heart using a macrovascular casting technique

WANG Yu, ZHOU Su-fen, ZHOU Yu-han, YIN Jiabao

Department of Ultrasonography, Xiang yang No.1 People’s Hospital, Hubei University of medicine, Xiang yang 441000, Hubei Province, China

Objective

To explore the application of a macrovascular corrosion casting technique via ABS perfusion in clarifying the spatial relationship between cardiac chambers in the fetal human heart.

Methods

Cardiovascular casting via ABS perfusion was performed for 28 fetal hearts, including 18 obtained from induced labor after permission due to congenital heart disease prenatally diagnosed by fetal ultrasound and 10 normal ones obtained from induced labor due to other non-cardiac causes.

Results

1. A total of 28 fetal cardiovascular casts were successfully prepared. The 10 normal fetal hearts generally showed a top-bottom spatial relationship between the atrium and ventricle at both the left and right.
2. Among the 18 fetal hearts with complex congenital heart (CHD), one heart had a front-back spatial relationship between the left atrium and ventricle, three had a left-right spatial relationship between the right atrium and ventricle, and others showed a normal top-bottom atrium-ventricle relationship.
3. One heart had a front-back spatial relationship between the left and right atria, 12 hearts had a front-back spatial relationship between the left and right ventricles, 12 hearts had a front-back spatial relationship between the left and right ventricles, two hearts had a top-bottom spatial relationship between the left and right ventricles, while others showed a normal left-right relationship of the ventricles or atriums between the two sides.

Conclusion

1. Clarification of the spatial relationship between cardiac chambers in the fetal heart helps us understand the anatomical structure of the heart.
2. Macrovascular casting can serve as an effective tool to intuitively demonstrate the spatial relationship between cardiac chambers of heart with complex CHD. 3. This technique can provide us with further information regarding the connection between the spatial relationship of cardiac chambers and CHD to improve accuracy of ultrasonic diagnosis, thereby possessing important clinical significance to surgical treatment.