Magnetic resonance (MR) imaging increasingly is used in subjects with congenital heart disease. Recent improvements have made it possible to acquire data for clinically useful 3D imaging. To take this even further, post-processing techniques, which allow not only external 3D imaging of the heart but also real-time, interactive, intracardial exploration of cardiac morphology, were also developed.

In this case, a 22-year-old woman underwent standard MR imaging 9 years after a lateral tunnel total cavo-pulmonary connection for tricuspid atresia as part of a routine follow-up program. From the MR volume data, a 3D virtual model of the heart was reconstructed. This model was explored using custom-designed software. The external view subsequently could be assessed interactively in real time from any point by the investigator using an intuitive interface. Furthermore, the internal morphology and relations could also be inspected in detail by zooming into any chosen cardiac structure.

An investigator-directed movie of the session was created and is available as an online Data Supplement. Two stills from the movie are shown, an external right anterior view (A) and an internal view from the apex of the left ventricle looking toward the basal part of the heart (B) (Figure).

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Total Cavo-Pulmonary Connection: A Virtual 3-Dimensional Fly-Through
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