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In Vitro Images of a Double Orifice Mitral Valve in a Reanimated Human Heart

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Using Visible Heart® methodologies [1] the heart from a 45 year old male (BMI 30.4, pre-op BP 145/70, HR 107, regular rhythm and normal heart tones), deemed not viable for transplant to a recipient patient, was explanted to an isolated heart apparatus. Briefly, this methodology utilizes a clear Krebs-Henseleit buffer to provide nutrients and oxygen to the heart and allow for native ex-vivo functionality while providing the opportunity to visualize the internal anatomy with endoscopes. Upon reanimation LV and LA pressures were 95/12mmHg and 13/15mmHg respectively during sinus rhythm. The patient's heart presented with no signs of any other congenital pathology and a pre-operative ultrasound indicated a 65% LV ejection fraction, normal chamber dimensions and trivial mitral regurgitation. The double orifice mitral valve can best be defined as an incomplete bridge, situated toward the superior commissure of the valve and supported by the superolateral (anterolateral) papillary muscle. Shown here is a series of four screenshots of the valve in both systole (Figure 1 A&B) and diastole (Figure 1 C&D) from the left atrium (Figure 1 A&C) and the left ventricle (Figure 1 B&D). These images clearly show the fibrous connection between the mural (posteroinferior) and aortic (anterosuperior) leaflets in the central region. Interestingly, the chronic presence of the fibrous bridge in this patient has had seemingly negligible effect on overall cardiac performance. Functional video footage of the valve can be accessed via the link provided (An accompanying video for this article can be viewed on the Internet at <http://ats.ctsnetjournals.org/content/volNUMBER/issueNUMBER/images/data/PAGE/DC1/FILENAME>).

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Figure 1.