**On-line supplement**

**Table: A comparison of the helical heart and myocardial mesh models.**

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|  | **The Helical Heart** | **The Three-Dimensional Mesh** |
| **How are the cardiomyocytes arranged?** | Based on skeletal muscle anatomy, taking origin from pulmonary trunk, and inserting to aortic root. | Based on modified blood vessel, with cardiomyocytes attached to each other, supported in fibrous matrix. |
| **How does histological evidence relate to proposed arrangements?** | Proponents have failed to provide evidence to show any boundaries that would need to enclose the purported components of the solitary myocardial entity so as to permit its uniform dissection. In reality, such boundaries do not exist. | Histology reveals presence of cardiomyocytes bound together within an endomysial framework, with perimysial spaces separating aggregated units. |
| **What is the alignment of the aggregated chains of cardiomyocytes?** | Proponents deny the existence of circumferential chains of cardiomyocytes. | Multiple dissections and histological studies show changing helical angle of aggregated cardiomyocytes at increased depth of ventricular wall, with middle component made up of circumferential aggregates. These findings now confirmed by diffusion tensor magnetic resonance imaging. |
| **How do the findings impact on cardiodynamics?** | Proponents suggest independent action of purported limbs of unique band, which would be impossible in the absence of fibrous sheaths enclosing the alleged components. | Investigations using force probes reveal presence of unloading and auxotonic forces. Tangential and intruding populations of cardiomyocytes shown to respond differently to therapeutic agents. |
| **What evidence is provided in terms of cardiac development?** | Proponents are unable to propose a rational explanation as to why cardiomyocytes should take origin from pulmonary trunk, and insert to aortic root. | Aggregations of cardiomyocytes within ventricular walls, and formation of fibrous matrix, are relatively late events in development. Mural architecture will follow formation of chambers, and not vice-versa. |
| **Evidence regarding ventricular conduction.** | No evidence to show that activation follows the direction of the purported solitary band. | The model recognises the presence on insulated ventricular pathways that then activate the aggregated cardiomyocytes in ordered fashion. |
| **Does the concept stand up in the context of the congenitally malformed heart?** | Difficult to account for a unique band encircling both ventricular cavities in setting of lesions such as Ebstein’s malformation, or hypoplasia of the right or left ventricle. | Formation of mural architecture is late developmental event, and can respond to abnormal cardiac development. |