

Clinical Case Review

Cardiac Assessment of Mechanical Valve Function Using Vitrea® Software

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INTRODUCTION

Questionable mechanical valve function necessitated the evaluation of this female patient. The patient underwent implantation of Starr-Edwards mechanical valve 25 years earlier. She underwent a routine follow-up echocardiogram and was informed that the valve needed to be replaced. Patient was asymptomatic and requested a second opinion.

Dr. Wojciech Mazur imaged and evaluated the patient.

METHOD

Patient was imaged with cardiac CT in June 2007.

FINDINGS

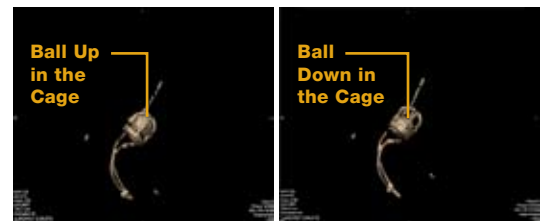
Using the Cardiac Arteries protocol, the Vitrea® software generated a 3D color image. The evaluation began by reducing the image quality to maximize workstation speed. The Window Level function was used to remove all soft tissues and artifacts to isolate the pacemaker wires and mechanical valve (see Figure 1).

The valve function was then assessed by observing it in motion (see Figure 2). The valve was functioning normally.

Figure 1: Removal of Soft Tissue and Artifacts to Visualize Valve



Figure 2: Observation of Valve Movement



Clinical Case Review

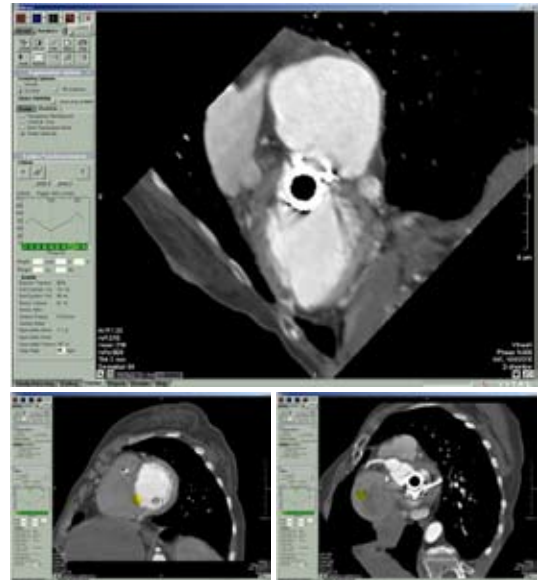
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Cardiac function was then assessed using the same view seen in echocardiography (see *Figure 3*). Ejection fraction (EF) calculation was at 60%.

Figure 3: Calculation of EF



Figure 4: Confirmation of EF Calculation



Clinical Case Review

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Misregistration artifact was assessed during segmentation and selected best phase based on the appearance of mid RCA. Despite the patient's high heart rate and presence of artifacts, it was noted that Phase 75% rendered the perfect RCA (see Figure 5).

Once respiratory artifact and coronary anomalies were ruled out, vascular analysis of the RCA, LAD and LCX vessels were performed, which were all unremarkable (see Figure 6).

CONCLUSION

This complex case was concluded in under 10 minutes and confirmed normal function of the mechanical valve.

Figure 5: Rendering of RCA at Phase 75%



Figure 6: Analysis of Vasculature

