

Pericardial Constriction Following Coronary Artery Bypass Grafting: A Magnetic Resonance Study

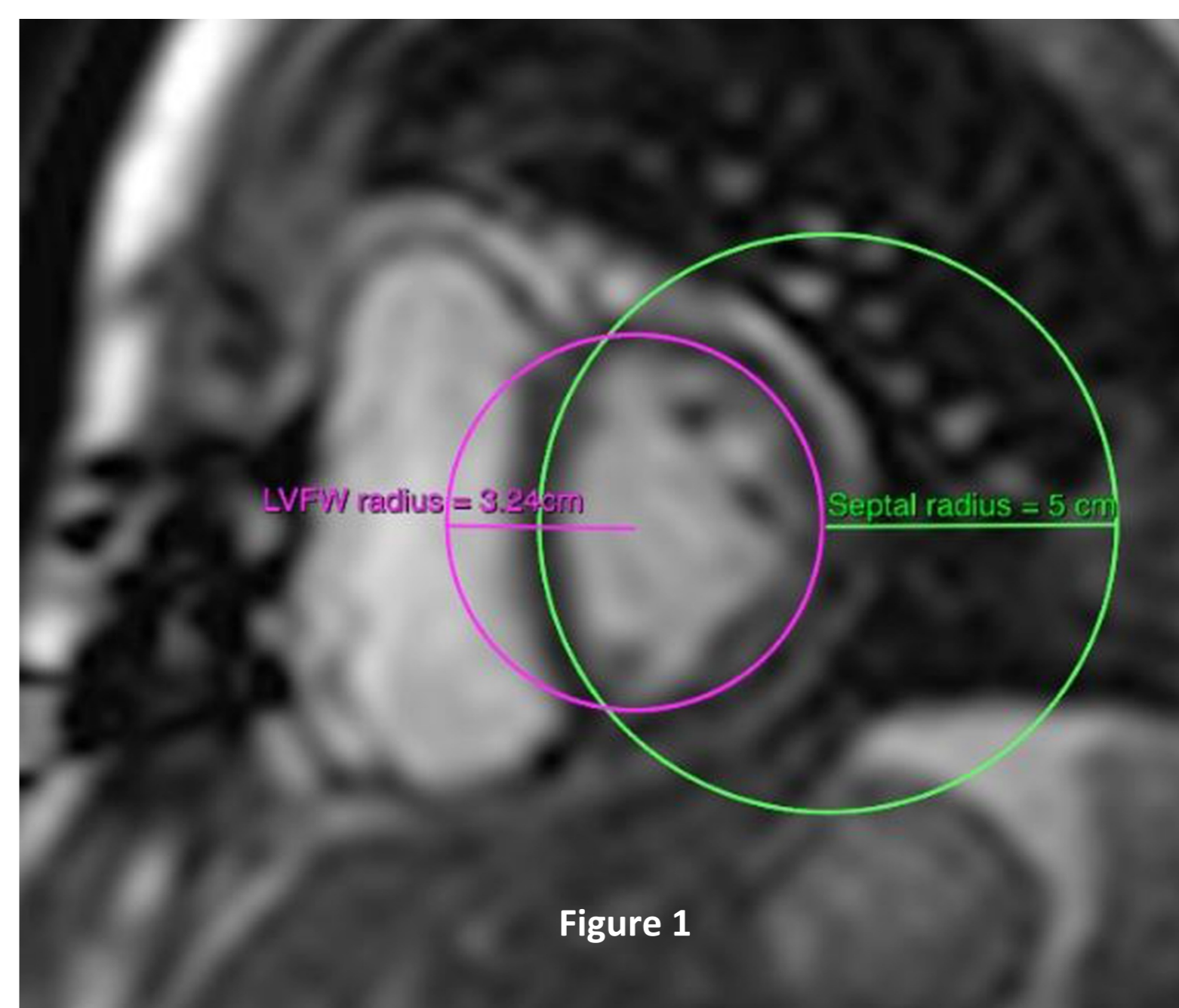
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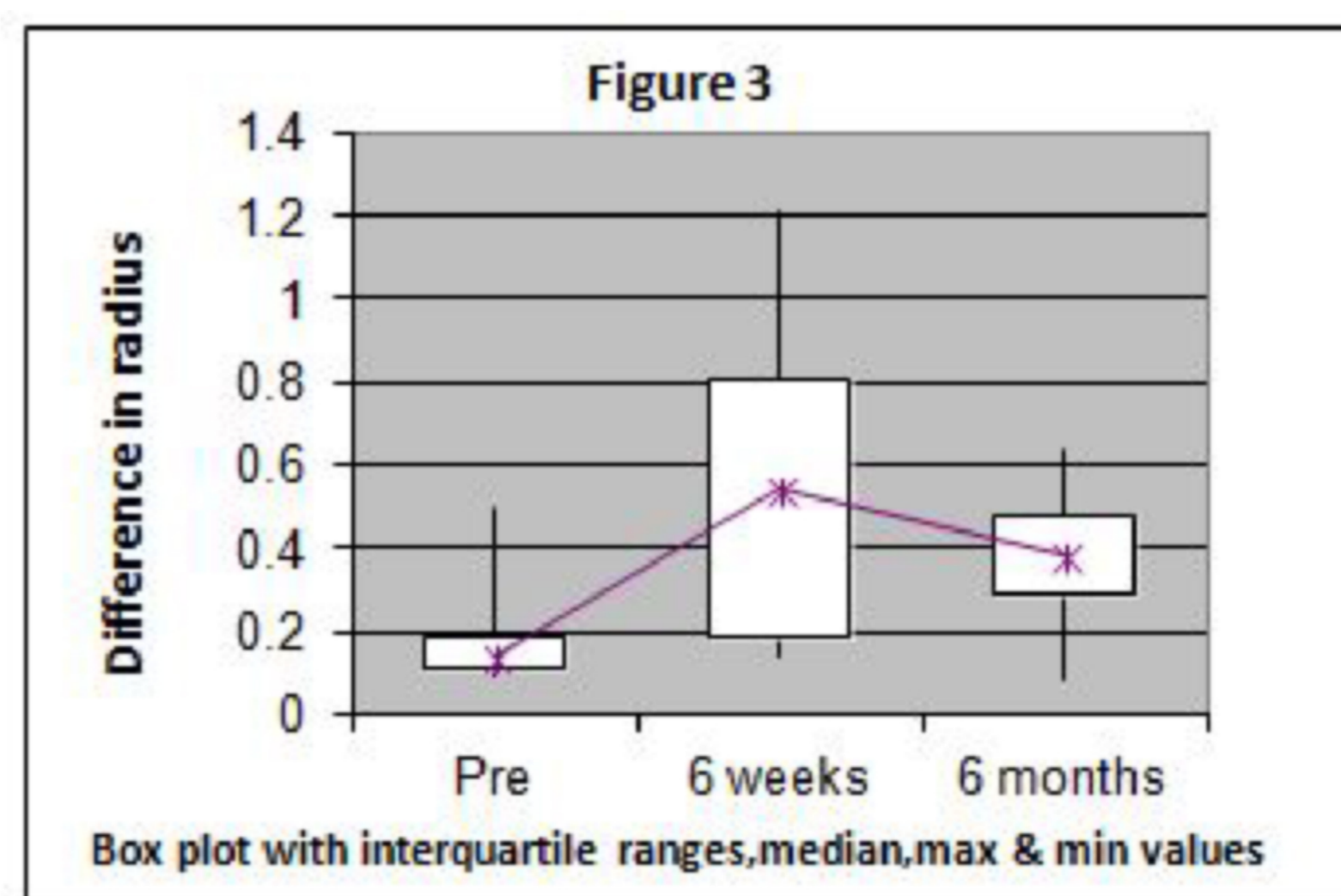
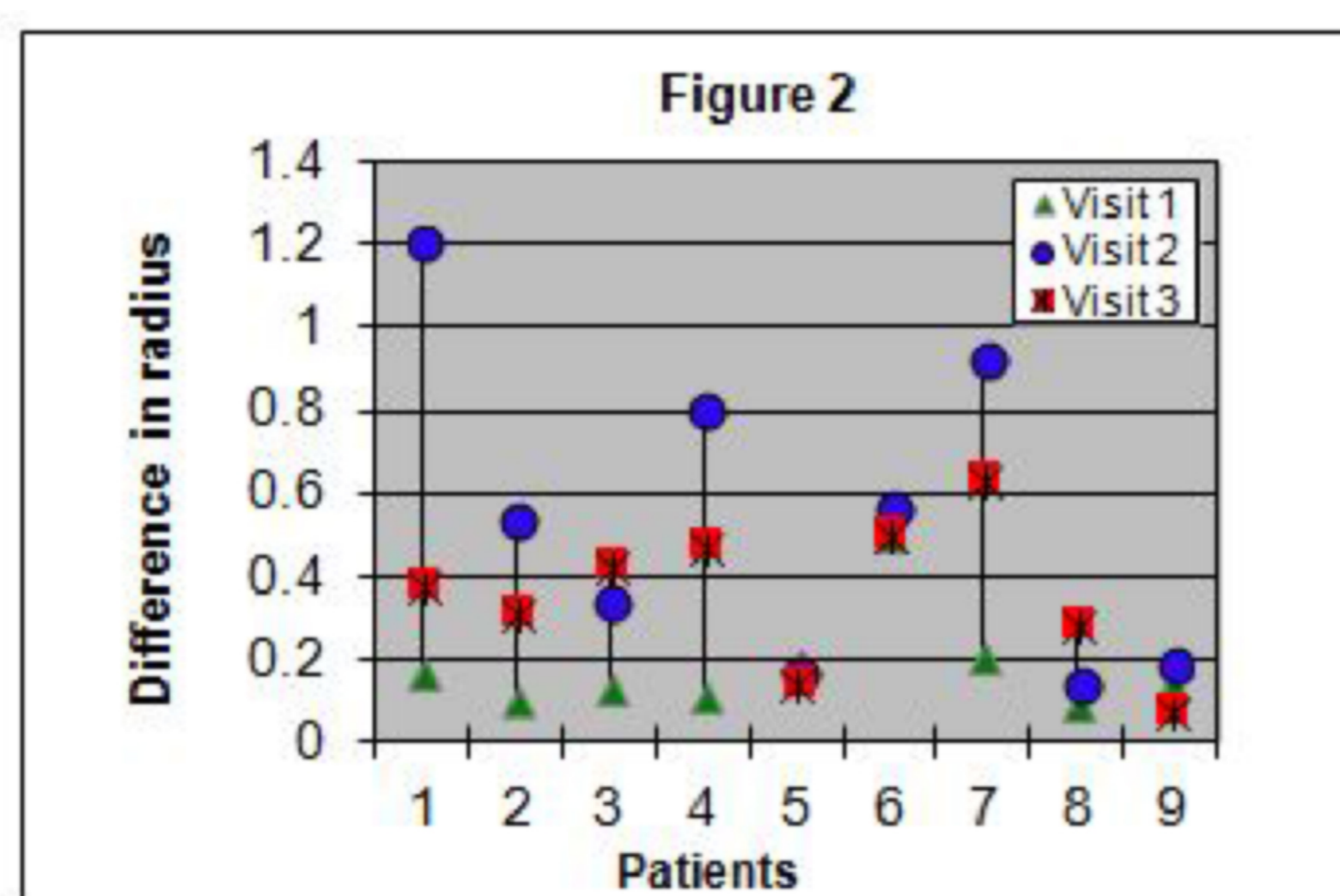


Background: Constrictive Pericarditis is a rare but serious complication following Coronary Artery Bypass Grafting (CABG). There are certain characteristics of pericardial constriction which can be identified by Cardiovascular Magnetic Resonance (CMR). These have been studied in a population known or clinically suspected of having pericardial constriction. However, few data are available with regard to CMR features of constrictive physiology (CP) in asymptomatic post CABG patients. It is clinically important to determine the degree to which CMR features of CP is a normal finding post CABG, when considering further intervention on symptomatic patients based on the CMR images. Therefore, the purpose of this study was to investigate the incidence and clinical course of CP observed on post-operative CMR examination in patients who had undergone isolated CABG surgery.

Methods: Patients underwent CMR imaging at baseline (pre CABG), 6 weeks and 6 months post CABG. On free breathing short-axis cine MR images, septal motion was assessed, and the septal and left ventricular free wall (LVFW) radii of curvature were quantified and normalized to end systole. Abnormal diastolic septal motion was expressed in terms of the largest difference in normalized radius between the septum and the LVFW. For morphologic evaluation of the pericardium, spin-echo and gradient-echo MR images were analyzed. The pericardial thickness was measured at the atrio-ventricular grooves, the inter-ventricular grooves and along the free wall of the ventricles.



Results: 9 patients were studied. No significant pericardial thickening or pericardial effusion was seen in any of the study patients. Significant septal flattening was noticed in 3 (33%) of the 9 patients on their 6 week post CABG scan (Figure 1). The maximal difference in normalised radius of curvature between the septum and LVFW on the 6 week post CABG scan was significantly higher (Mean 0.54 cm, Standard deviation 0.38, 95% confidence intervals 0.29 - 0.79, $p < 0.02$) as compared to baseline (Mean 0.18 cm, SD 0.13, 95% CI 0.1 - 0.26). The 6 month follow up scan showed a downward trend (Mean 0.36 cm, SD 0.18, 95% CI 0.24 - 0.48) (Figure 2).



Conclusions: Constrictive physiology as demonstrated by abnormal diastolic septal motion is a frequent phenomenon post CABG in asymptomatic patients. However, the majority of the changes resolves by 6 months without progressing to clinically symptomatic constrictive pericarditis.