Cardiac stereotactic body radiation therapy in advanced heart failure patients with recurrent ventricular tachycardia – a case series

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Introduction: Cardiac stereotactic body radiotherapy (SBRT) is a treatment option for patients with refractory ventricular tachycardia (VT) despite optimal medical therapy and one or more failed catheter ablation procedures.[1] Several studies have reported that SBRT is associated with reduced VT burden and implantable cardioverter defibrillator (ICD) therapies.[2] This study aimed to assess the clinical outcomes of cardiac SBRT for VT in our institution.

Patients and Methods: The target substrate for radioablation was determined by combining a preprocedural cardiac computed tomography (CT) scan and 3D cardiac modeling software merged with a real-time CT scan for simulation. All patients were treated with a single 25 Gy fraction using respiratory motion mitigation strategies. We analyzed the outcome of death, the incidence of recurrent VT, and possible side effects of irradiation.

Results: Three men aged 34, 61, and 66 years with advanced heart failure as a consequence of ischemic heart disease were referred for cardiac SBRT due to VT and ICD therapy recurrence despite antiarrhythmic drugs (AADs) and previously failed catheter ablations for VT. Cardiac SBRT was successfully performed in all patients. During the follow-up, all patients had VT recurrence. In two patients, it happened during a 6-week blanking period, while the third patient had VT recurrence after six months. Two patients eventually received a heart transplant, one and ten months after cardiac SBRT, respectively. The third patient underwent endocardial-epicardial catheter ablation for VT a month after receiving cardiac SBRT, but eventually died nine months post-SBRT due to advanced heart failure worsening. There were no radiotherapy-related adverse events observed during follow-up.

Conclusion: We demonstrated the feasibility and safety of cardiac SBRT in advanced heart failure patients. However, cardiac SBRT did not achieve successful mid-term arrhythmia control in our selected high-risk patients, and, therefore, efficacy aspects remain unclear. Further studies are needed to clarify this issue.

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LITERATURE

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