

Stereotactic Cardiac Radiotherapy Reduces Structural Heart Disease Associated Refractory Ventricular Tachycardia: A Metaanalysis

Nourhan Chaaban¹, Sagar Ranka², Cameron Carlson³, Farhad Sami⁴, David Aldavan², Seth H Sheldon², Madhu Reddy², Amit Noheria²

1. University of Kansas-Wichita, Wichita-KS
2. University of Kansas Medical Center, Kansas City-KS
3. University of Denver, Denver-CO
4. University of Iowa, Iowa City-IA

INTRODUCTION

Cardiac stereotactic body radiotherapy (SBRT) is a paradigm changing treatment for refractory ventricular tachycardia (VT) in patients with structural heart disease. We sought to review the effectiveness of SBRT reported in published studies.

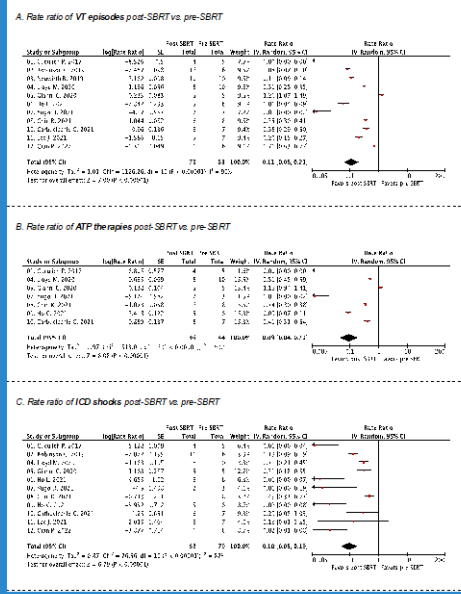
HYPOTHESIS

There is a reduction in VT events after cardiac SBRT.

METHODS

We performed a comprehensive literature search in PubMed, Embase and Google Scholar including all studies on cardiac SBRT for VT till May 2022. Efficacy was evaluated as random-effects pooled rate ratios (RR) of VT episodes, antitachycardia pacing (ATP) therapies and implantable cardioverter-defibrillator (ICD) shocks post-SBRT (after 6-week blanking) and for 3-12 months pre-SBRT, with patients serving as their own controls.

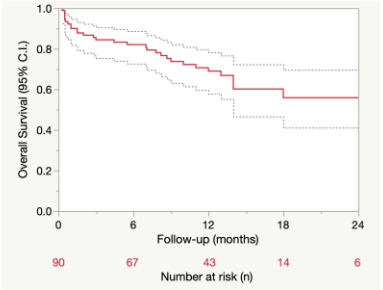
Figure 1. Metanalysis of uncontrolled studies evaluating rate ratios (RR) of ventricular tachycardia (VT) episodes, antitachycardia pacing (ATP) therapies and implantable defibrillator-cardioverter (ICD) shocks post- vs. pre-stereotactic cardiac radiotherapy.



RESULTS

We included 12 uncontrolled studies on cardiac SBRT (90 patients) published 2017-2022 with median follow-up ranging 6-28 months. The pooled RR of VT episodes, ATP therapies and ICD shocks post- vs. pre-SBRT were 0.11 (95% CI 0.06-0.21, p<0.001), 0.09 (95% CI 0.04-0.20, p<0.001), and 0.10 (95% CI 0.05-0.19, p<0.001) as shown in Figure 1. There was significant heterogeneity in results (p<0.001 for all 3 endpoints). The Kaplan-Meier 1- and 2-year overall patient survival post cardiac SBRT was 69% and 56% respectively (Figure 2).

Figure 2. Kaplan-Meier overall patient survival curve post-stereotactic cardiac radiotherapy for refractory ventricular tachycardia among patients included in 12 studies (N=90).



CONCLUSION

Cardiac SBRT reduces recurrent VT episodes and ICD shocks in patients with VT refractory to medical therapy and catheter ablation. There is heterogeneity in results from different studies, likely related to differences in patient selection and treatment techniques. The overall patient survival in this high-risk population compares favorably to data from catheter ablation trials.

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