



# Influence of radiotherapy on cardiac implantable electronic devices: a single center experience



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## PURPOSE

Patients treated with a cardiac implantable electronic device (CIED) are increasing as well as patients who undergo radiotherapy (RT) for cancer. So, pacemaker (PM) and implantable cardioverter defibrillator (ICD) recipients may sometimes experience radiotherapy during life. Few papers address the consequences of RT on device function.

The aim of this study is to illustrate our experience and evaluate the safety of radiotherapy in these patients.

## METHODS

We retrieved data from personal files of recipients of PM and ICD who underwent RT in our institution from 2003 to 2011. All patients were evaluated by an electrophysiologist and by a radiotherapist before starting therapy. The device was relocated if near to or into the field of irradiation. Pacing-dependent patients were reprogrammed with asynchronous stimulation. In ICD recipients, a magnet was applied over the device before the RT session, a cardiologist was always present and the patient was monitored with an external defibrillator.

Table. Patients characteristics

Variable	Pace maker (N 23)	Cardioverter Defibrillator (N 10)
Sex (male/female)	10/13	7/3
Median age (interquartile range)	80 (71-87)	75 (73-79)
Single chamber device	11	2
Dual chamber device	12	2
CRT device	0	6
Site of RT		
head-neck	3	3
thorax	13	1
pelvis	7	6
Total dose Gy (mean ± SD)	53,2 ± 15,5	43,1 ± 12,3
Number of applications (mean ± SD)	27 ± 8	21 ± 9
Dose for application (mean ± SD)	2,11 ± 0,75	2,15 ± 0,62

## RESULTS

Thirty-three patients, 23 PMs and 10 ICDs, 17 males (51,5%), median age 78 years, underwent RT. Six patients for head-neck, 14 for thorax and 13 for pelvis district cancer. In 3 cases (9%) we had to relocate the device. We observed 2 malfunctions (6%), one PM and one ICD. In the PM patient magnetic frequency was set to 30 beats per minute and in the ICD patient all but shock anti-tachycardia therapies were inactivated. Both malfunctions were successfully corrected by reprogramming the device and patients finished their cycle of RT. No session was stopped because of patient's clinical impairment.

## CONCLUSIONS

RT in CIED recipients is safe when patients are accurately evaluated to prevent drawbacks. In our experience, malfunctions resulted in no danger to patient's life and were always corrected via telemetry. Our internal protocol proved to be adequate to safely irradiate also patients with ICD.