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Capsule Endoscopy In A Patient With An Implantable Defibrillator And A CCM System

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Introduction

In patients with unidentified blood loss, wireless video capsule endoscopy (CE) has emerged as the gold standard, particularly when there is a strong suspicion of small intestinal disease [1].

The recorder unit, which is positioned around the patient's waist, receives constant radiofrequency transmissions of electromagnetic waves that are images acquired by CE. According to studies to date, CE is thought to be relatively safe [2, 3]. However, the presence of implanted cardiac devices still poses a relative contraindication for a number of applications involving external electromagnetic sources because of the possibility that interference could lead to temporary or permanent device dysfunction [4]. Implantable cardioverter-defibrillators (ICDs) are a well-established form of therapy, whereas cardiac contractility modulation (CCM) is a recently created novel device therapy designed to treat heart failure with growing success.amount of implants of devices worldwide. Two screw-in leads are used to stimulate the right ventricular septum using a CCM device. By affecting calcium fluxes, the device offers high-energy stimulation to the heart during its absolute refractory period, which enhances cardiac contractility [5].

We describe a patient who has a CCM System (OPTIMIZER III, Impulse Dynamics USA, Inc., Orangeburg, NY)as well as a dual-chamber ICD (Atlas + DR V-243, St. Jude Medical, Inc., Sunnyvale, CA), on which CE was carried out using a PillCam SB from Yoqneam, Israel. The three electronic devices' potential for interfering with one another was assessed.
Case Report

Due to melena that resulted in a normochromic normocytic anaemia (haemoglobin on admission: 7.5 g/dl, MCV: 91 fl, MCH: 30.7 pg, MCHC: 33 g/dl), a 74-year-old man was hospitalised to our hospital. Due to sporadic atrial fibrillation and mitral valve replacement, oral anticoagulation was temporarily stopped. Both the colonoscopy and oesophagogastroduodenoscopy produced negative results. Due to probable interference between the RF radiated by the capsule and the ICD or other devices, CE was planned to check the small bowel mucosa. the CCM apparatus. One hour of CCM delivery and 1.4 hours of therapeutic interruption were built into the CCM device's programming for delivery ten hours per day.The patient was taken to the intensive care unit after taking the PillCam SB capsule. The device parameters for the CCM and ICD remained the same. Vital signs and the ECG were continuously monitored. The ICD in addition to

Discussion

There are currently no reports on CE in patients using a CCM device, and only a few research have looked into possible interaction between CEplus ICDs. Due to electromagnetic interference, Dubner et al. reported an improper shock therapy during in vitro investigations in one of the six different tested ICD devices, and they highlighted safety concerns about CE in ICD patients [6]. In general, due to a particularly sensitive setup of specialised band-pass filters in their sensing circuits, radiofrequency generated as electromagnetic waves could explain problems of cardiac devices. The implanted CCM and ICD devices, which both communicate using frequencies in the kHz range, did not indicate any issues throughout the CE procedure. furthermore image transmission processing of the signal from the PillCam SB to the recorder, which uses a 434.09 MHz carrier frequency and 2 Hz pulse trains (250 ms on, 250 ms off), was unaffected, producing clear endoscopic images throughout the recording time.

In conclusion, no device problems were noticed in a patient wearing an ICD and a CCM device during CE, but due to the lack of expertise, attentive monitoring should always be used in connection with CE in these patients.

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