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Successful implantation of an implantable loop recorder in a patient with bilateral silicone breast implants leading to a diagnosis explaining repeated syncopal events

Beeler Remo, Gujer Samuel, Lehmann Dietrich, Kaeslin Thomas

[a] Cardiology Department, Cantonal Hospital of Obwalden, Switzerland
[b] Gynaecology Department, Cantonal Hospital of Obwalden, Switzerland

Summary

We report the case of a 54-year-old patient with bilateral silicone breast implants in whom successful implantation of a subcutaneous loop recorder led to the diagnosis that explained her repeated syncopal events.

Keywords: *implantable loop recorder, silicone breast implants, complications, syncope*

Introduction

An implantable loop recorder (ILR) is a subcutaneous cardiac monitoring device used for continuous long-term electrocardiographic monitoring of the heart rhythm. It is used, for example, in patients with unexplained syncope or cryptogenic stroke. Complications during implantation are rare [1–3]. Experience in patients with silicone breast implants is, however, scarce.

Case report

A 54-year-old, otherwise healthy female patient with no regular medication underwent laparoscopic hysterectomy because of postmenopausal bleeding. During the operation a "cardiac rhythm disorder", which was successfully treated with atropine by the attending anaesthesiologist, was reported. Unfortunately, no further documentation or rhythm strip was available and the nature of the episode remained unclear. The postoperative observation period was uneventful; specifically, no rhythm disorders were found (telemetry rhythm surveillance) and the patient was discharged soon thereafter.

About a month after discharge the patient presented herself, as planned, in the cardiology outpatient clinic for workup of the unclear intraoperative episode. The patient's personal history revealed, besides bilateral silicone breast implants for aesthetic reasons in 2011, several syncopal events: one, about 6 months earlier, following a bee sting in a sitting position and two others about 6 and 15 years earlier, which the patient could no longer describe in detail. Further cardiac symptoms such as angina, dyspnoea, palpitations or dizziness were denied. Family history for sudden cardiac death was negative. A full cardiac workup revealed no relevant findings: echocardiography was normal with all cardiac cavities within the normal range and with normal function. No relevant valvular disease was found. A 48-hour Holter ECG recording demonstrated no relevant arrhythmias, specifically no heart block or bradycardia. During an exercise treadmill test the patient was without any specific complaints and the heart rate rose normally up to a maximum of 189 bpm (113% of expected). Once again, no arrhythmias were observed. On the basis of these normal findings, an expectant approach was chosen, with the patient advised to report any further syncopal events or cardiac complaints.

About half a year later the patient suffered from a viral gastrointestinal infection with diarrhoea and vomiting. While vomiting she fainted several times, which led to a new cardiology consultation where she agreed to have an ILR implanted to further the diagnostic investigations. Because of the known bilateral silicone breast implants, a gynaecological consultation before the scheduled implantation was arranged. A sonographic examination revealed a distance of about 3–4 cm between the left lateral sternal border and the medial boarder of the left silicone breast implant. After the patient had been informed about feasibility and the risk of perforation of the silicone implant, she agreed to the procedure.

According to the manufacturer of the device used, there are three recommended ways to implant the ILR (fig. 1), the best being number 1 (at 45 degrees to the sternum over the fourth intercostal space, V2–V3 electrode orientation). The superior end of the device is positioned approximately 2 cm (±1 cm) lateral to the left sternal border). Because of the silicone breast implants, we decided to implant in the way listed as option number 2 – fourth intercostal space approximately 2 cm (±1 cm) from and parallel to the sternal border. Option number 1, in our eyes, held the bigger

Correspondence:
Dr Remo Beeler, MD, Kantonsspital Obwalden, Brünigstrasse 181, CH-6060 Sarnen, remo.beeler[at]ksow.ch

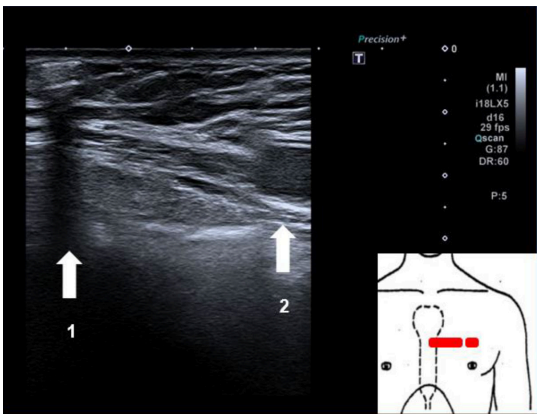
risk of puncturing the silicone implant and number 3 may interfere and cause discomfort with a wire support bra.

After defining a sterile field and disinfecting the local area, ultrasound-guided subcutaneous local anaesthesia was performed, in the direction of the planned implantation orientation of the device (parallel to the left sternal boarder, caudally, starting in the fourth intercostal space). After this, we inserted the device with ultrasound guidance in the direction in which the local anaesthetic was administered, following the manufacturers recommendations on how to implant their device. A sonographic check showed that there was sufficient subcutaneous tissue between the loop recorder and the medial boarder of the left silicone implant (fig. 2). The initial device interrogation revealed a sensing level of more than 0.3 mV (lying and sitting positions) with a clearly visible P-wave and good discrimination of the QRS-complex (fig. 3). The patient was discharged after a few minutes of clinical observation with normal vital signs and no specific complaints.

A chest X-ray performed at a later stage for other reasons revealed the device to be located as initially intended (fig. 4). The following weeks were uneventful, the scar healed nicely (fig. 5) and the patient did not complain of any device-related problems.

Some 6 weeks later, several automatically generated episodes were transmitted via the internet (fig. 6). An urgent telephone follow-up revealed that the patient was suffering from (yet another) episode of diarrhoea and vomiting, and had suffered five syncopal events. In total, 10 episodes of ventricular asystole were recorded, the longest for 30 seconds, which explained the patient's syncopal events. She was admitted urgently to hospital and, after cure of the viral gastroenteritis, a dual-chamber pacemaker was implanted and the ILR explanted without any complications.

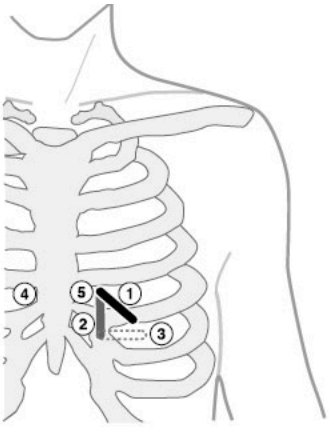
Figure 2: Sonographic check of the device position in relation to the silicone breast implant: 1. Subcutaneous ILR with posterior ultrasound shadow. 2. Medial boarder of left silicone breast implant.



Discussion

Implantation of ILR is now, according to the latest 2018 ESC guidelines on syncope [5], a class IA indication "in an early phase of evaluation in patients with recurrent syn-

Figure 1: Implantation sites recommended by the manufacturer [4]. Reproduced with permission of Medtronic, Inc.



1 Best recommended insertion location
2 Good recommended insertion location
3 Optional inframammary fold insertion location
4 V1 ECG electrode location
5 V2 ECG electrode location

Figure 3: First recorded ECG signal after implantation with good discrimination of P-waves and QRS-complexes.

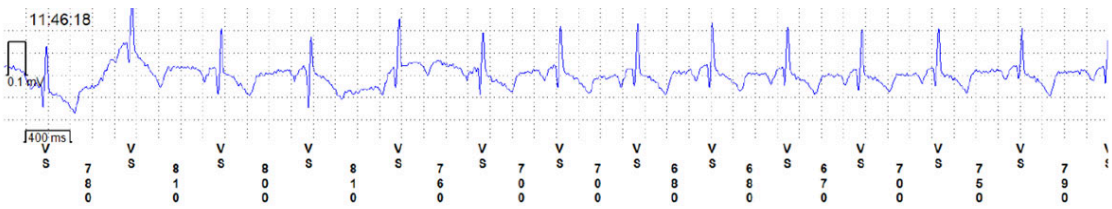


Figure 4: The X-Ray shows the ILR parallel to the left sternal border. The silicone breast implants are hardly visible.

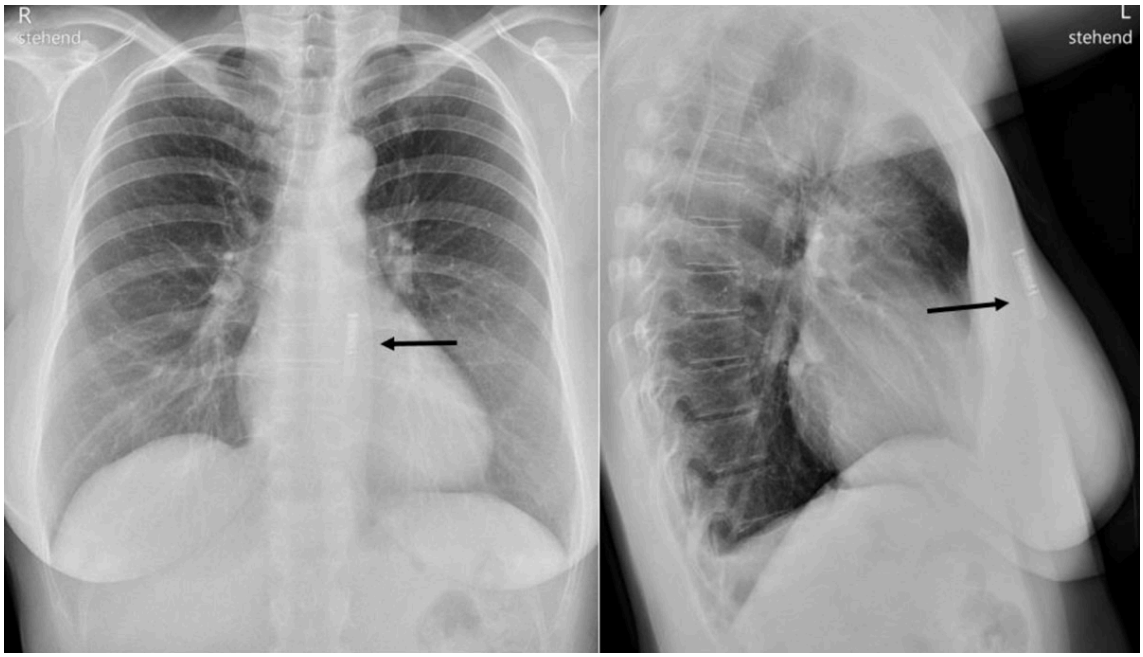
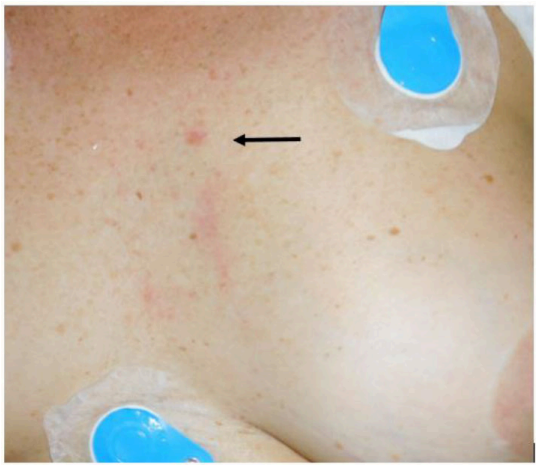


Figure 5: Nicely healed scar from the ILR implantation on the left parasternal boarder at about the fourth intercostal space.



cope of uncertain origin, absence of high-risk criteria, and a high likelihood of recurrence within the battery life of the device" and also a class IA indication "in patients with high-risk criteria in whom a comprehensive evaluation did not demonstrate a cause of syncope or lead to a specific treatment, and who do not have conventional indications for primary prevention ICD or pacemaker indication", such as our patient. Complications are rare and include, among others, pain, infection, local bleeding, pneumothorax and migration of the device [3, 6].

To our knowledge, however, experience in patients with silicone breast implants is limited and complications such as rupture of the implant have been reported [7]. Knowing this, we took precautions and evaluated the feasibility of implantation beforehand together with the gynaecologists. During the implantation we followed a multidisciplinary approach, with the assistance of a breast specialist to guide the puncture and implantation, and to make the medial boarder of the silicone breast implant visible through sonographic guidance.

Conclusion

We believe, silicone breast implants are, after careful evaluation, no contraindication to subcutaneous ILR implantation, if indicated. The space between the medial boarder of the silicone implant and the border of the sternum needs to be evaluated, and sonographic control and guidance during implantation is recommended. Furthermore we recommend the implant option parallel to the sternum boarder. A good enough sensing signal can be achieved this way.

Informed consent

Written patient consent to publish photographs and graphs for this case report has been received.

Disclosure statement

The authors report no conflict of interest regarding this case report.

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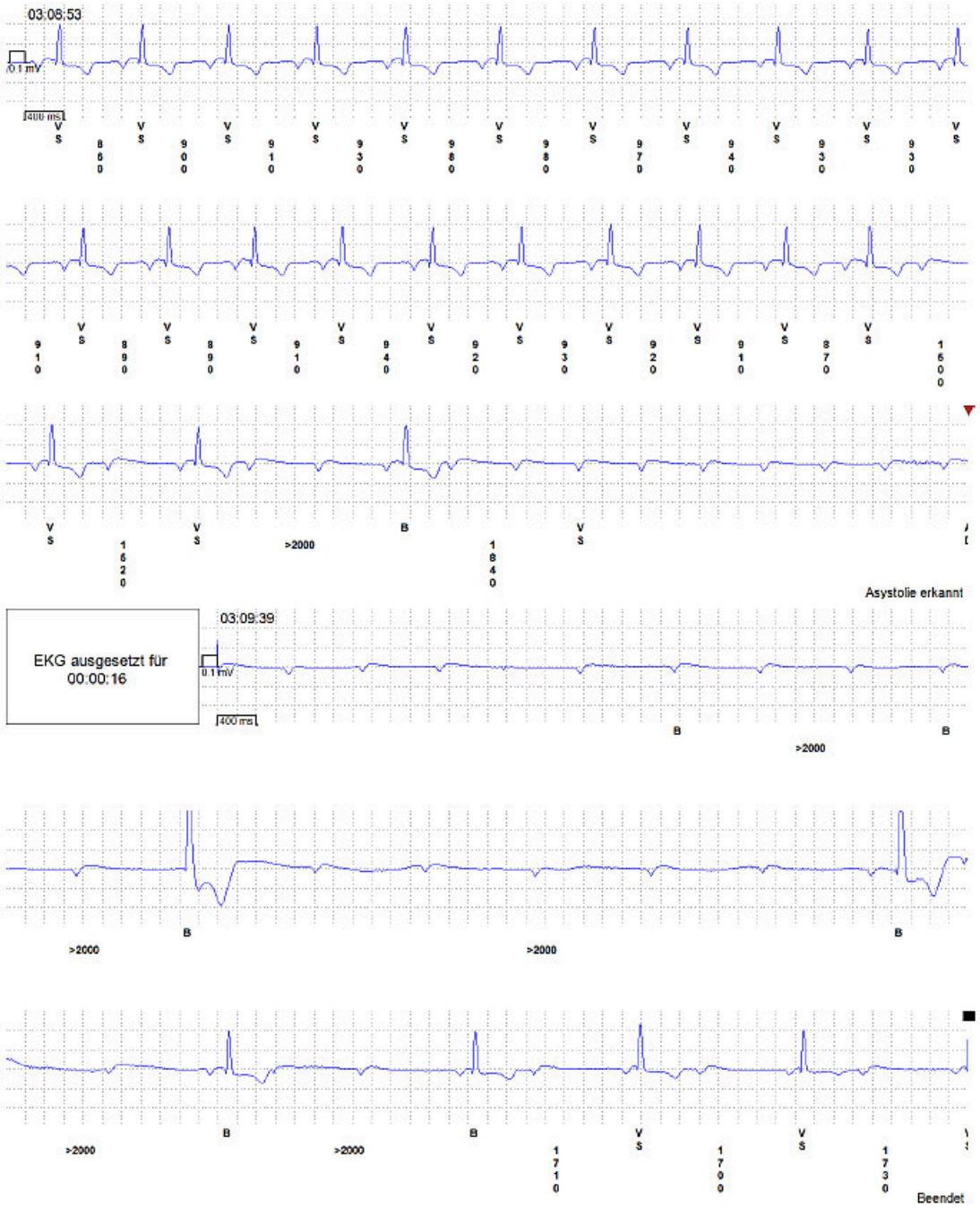
Figure 6: One of the automatically transmitted episodes, showing complete atrioventricular block for over 16 seconds with an insufficient ventricular escape rhythm.



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