# Implantable cardioverter defibrillator generator replacement and breast implant revision; a combined case.

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**Key clinical Message** :

**With the increasing number of patients requiring a cardiac implantable electronic device (CIED), physicians will encounter patients with both cardiac and breast implants.** Our case indicates the importance of appropriate planning and multidisciplinary input for device procedures in patients with breast implants or vice versa. When planning the procedure, the aesthetic outcome needs to be considered.

**Introduction:**

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Breast augmentation is the most popular aesthetic procedure in the United Kingdom.1 With more than half a million of the population in the United Kingdom having a CIED2, a higher number of female patients are expected to require both a CIED and breast augmentation or reconstruction procedure. These procedures involve the same anatomy and clinicians with specialist expertise in both CIEDs and breast surgery need to be aware of the potential challenges of managing such patients.

**Case history:**

**A female with small stature in her 50s had bilateral mastectomies as a prophylactic operation in 2011 and immediate reconstruction with breast implants which were placed in a submuscular plane.**

**A few years afterward, she experienced an anterior myocardial infarction and was treated with primary percutaneous intervention to the left anterior descending artery. This event resulted in severe left ventricular dysfunction that did not improve despite optimal heart failure treatment and in 2017, a dual chamber ICD was inserted on primary prevention grounds.**

**For this procedure, a DDDR Autogen MINI ICD (Boston Scientific, USA) was implanted in a subclavicular subcutaneous pocket in a standard fashion. A Mini ICD generator was preferred over a standard size ICD given her small stature, minimal excess tissue, and the presence of breast implants.**

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A few months later, the patient raised concerns as the lateral edge of the defibrillator was prominent and caused discomfort with movement. She also had concerns about the aesthetic result because the device was prominent, and the lower margin of the generator was sited anterior to her left breast implant reconstruction.

**In 2019 after she lost weight and experienced more discomfort, a cardiologist and a breast surgeon consultant reviewed jointly her in the clinic. After discussion with the patient, it was decided that she would be best served by a combined procedure to remove the left sided breast implant from its current subpectoral plane and place it prepectoraly, beneath a further layer of acellular dermal matrix; this had the effect of allowing the defibrillator to be sited deeper to the breast implant on top of the pectoralis muscle. The procedure alleviated her discomfort from the device and the patient was pleased with the aesthetic result.**

**Methods:**

**She was followed up in the device clinic and early 2024 the device reached recommended replacement time when she was listed for generator change. She was keen to continue to have an ICD in situ despite not having any appropriate treatments from the device. Once again, a joint case between a breast surgeon and cardiologist was arranged to allow generator change minimising the risk of implant complications. Due to the marginal increase in size between an Autogen MINI generator (Boston Scientific, USA; 26.5cc, 9.9mm) and a Resonate extended longevity ICD (Boston Scientific, USA; 29.5cc, 9.9 mm), the decision was made to implant the extended longevity ICD to allow longer interval between the need for another generator change. This would therefore require a smaller breast prosthesis to ensure breast size symmetry.**

**The patient consented for the procedure, and she was admitted electively to the catheter lab. She was prepped and draped allowing access above and below the breast implant. The procedure was performed with local anaesthetic and conscious sedation. An elliptical incision was made around her scar caudal to her breast prosthesis. The prosthesis was mobilised, the old generator was removed and the new generator was connected to her old leads (Figure 1). The device was then placed in an antimicrobial pouch (Tyrx, Medtronic, USA) to reduce the risk of infection and the generator was sutured to the underlying fascia at the cranial aspect of her prosthesis aiming to obtain a good ICD shock vector because her shock lead tip was previously sited close to her generator (Figure 2). A new smaller breast prosthesis was implanted above the ICD generator. The wound was closed in layers with Monocryl 3-0 and Glue. The ICD was reactivated, and all checks were satisfactory. The patient was pleased with the aesthetic results and the wound healed well in the 6-week device check in the clinic.**

**Discussion** :

**Although successful cases of combined CIED and breast implantation through the same plane performed by surgeons and cardiologists have been reported[3,4], to our knowledge this is the first report of a combined approach where the different size of the new ICD generator necessitated a simultaneous revision of the breast implant to ensure a good cosmetic result.**

**Both CIED and breast implants can be placed above and below the pectoralis major muscle and require special consideration when a fascial plane is shared. The subfascial prepectoral pocket is the preferred approach for most ICD implanters.[5] For patients with minimal adipose tissue at risk of device erosion or with aesthetic concerns, submuscular pockets are preferred.[6] Breast implants can be implanted in a subglandular, subpectoral, or subfascial fashion depending on patients preference and characteristics.[7]**

**Complications in patients with device and breast implants have previously been recorded. A breast implant rupture has been reported after the insertion of a defibrillator device when**

**both devices were implanted on the same plane.[8] A case of subpectoral migration of the device generator into the breast implant pocket has also been reported requiring the placement of an acellular biologic matrix to support the device.[9]**

**A multidisciplinary approach with device specialists and breast or plastic surgeons is required to ensure optimal management of this cohort of patients ensuring an aesthetic and safe outcome.[10] The aesthetic outcome needs to be taken under consideration, especially in young or female patients who may be more concerned about their physical appearance compared to older or male patients[11].**

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**Abbreviations** :

**Authors contribution:**

Dr Vasileios Lamprou: Data curation; writing – original draft; review and editing.

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