

# Management of infraclavicular squamous cell carcinoma exposing a pacemaker with a fasciocutaneous flap



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**Key words:** exposed pacemaker; fasciocutaneous flap; squamous cell carcinoma.

## INTRODUCTION

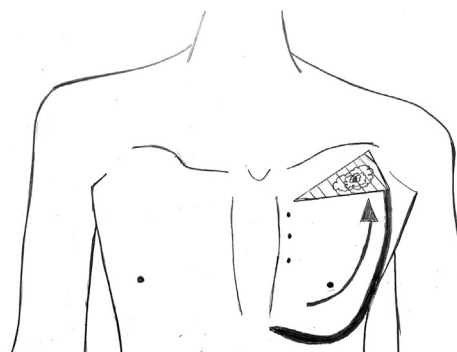
In an aging population, the anatomic proximity of cutaneous malignancies and cardiac pacemakers is becoming increasingly common.<sup>1,2</sup> When coincident, these 2 problems present an unusual clinical challenge, with the propensity of exposed pacemakers to form a nidus of systemic infection.<sup>3</sup> We describe a multidisciplinary approach for the excision of a cutaneous squamous carcinoma causing pacemaker exposure, the use of a fasciocutaneous flap for reconstruction, and pacemaker management. According to the angiosome distribution established by Saint-Cyr et al,<sup>4</sup> fasciocutaneous flaps incorporate their vasculature along fascial planes. Thus, these have been described as a treatment strategy for large squamous cell carcinoma (SCC) resections.<sup>5</sup>

## CASE REPORT

An alert 89-year-old, pacemaker-dependent man was referred by a dermatologist for a grossly infected, 7.5 × 6-cm ulcerative infraclavicular SCC surrounding an exposed pacemaker. His wound and blood cultures were positive for *Pseudomonas aeruginosa*, *Enterococcus*, and *Proteus*. His medical history included atrial fibrillation, sick sinus syndrome, coronary artery disease, and hyperlipidemia. The infected pacemaker required removal; however, because the patient was pacemaker dependent, a leadless pacemaker (Medtronic TM) was placed by the interventional cardiology department 20 days

### Abbreviation used:

SCC: squamous cell carcinoma



**Fig 1.** Line diagram demonstrating the rotation advancement flap incorporating the internal mammary perforators. The flap margin curved around the nipple to the inferior limit of the pectoris muscle and across to the midline xiphisternal region.

before surgery for subsequent pacing. Our ID consultant recommended the initiation of intravenous vancomycin and cefepime 11 days before surgery and, based on the culture or sensitivity results, changed the regimen to piperacillin and tazobactam 6 days before surgery, continuing for 7 days after surgery.

On the day of the surgery, under the same general anesthetic, the old, infected pacemaker

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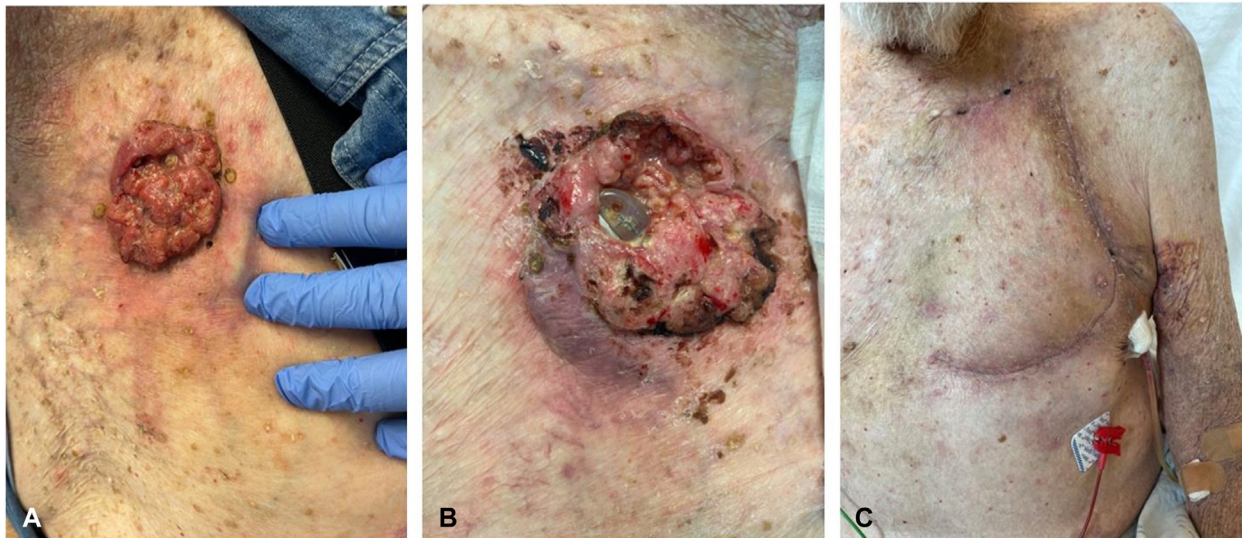
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**Fig 2.** **A and B,** Preoperative pictures depicting exposed pacemaker. **C,** Postoperative outcome of the fasciocutaneous flap.

was removed (G.P.) and standard en bloc excision of the cutaneous SCC was performed (B.H.H.).

The tumor had deeply tracked along the pacemaker hardware, involving the subcutaneous tissue, pectoralis fascia, and muscle. Radical resection incorporating the skin, subcutaneous fat, and pectoralis major muscle down to the ribs, measuring  $10 \times 9 \times 2 \text{ cm}^3$ , was required to clear the margins. At the base of this defect were the intercostal muscles and ribs.

For reconstruction, we used a medially based fasciocutaneous chest rotation-advancement flap incorporating the internal thoracic perforators in its base. The flap outline was designed in a curvilinear fashion extending inferiorly from the defect, running laterally to the nipple to reach the lower limit of the pectoralis muscle at the sixth rib, and curved medially to reach the midline. Flap elevation was from the lateral aspect to the medial aspect in the subfascial plane to reach and preserve the internal thoracic perforators. The flap was then transposed cephalad to completely cover the resection defect (Fig 1). The axillary perimeter of the donor defect was loose and closed upon itself in a linear fashion for approximately 6 cm. Upon inset, the flap had a 3-second capillary refill at its outer corner. A hematoma developed in the patient under the flap shortly after the reintroduction of anticoagulants, which was simply evacuated on postoperative day 7. The margins were clear, and the wound healed completely (Fig 2). The patient is currently paced with the same leadless pacemaker and is doing well 8 months after the surgery.

## DISCUSSION

The treatment of cutaneous malignancy near pacemakers requires a multidisciplinary approach to management. Cutaneous SCC is the second most common malignancy globally; yet, limited literature is available on invasive SCCs leading to exposed and infected pacemakers. To our knowledge, only 1 other case has been reported, which was repaired using a skin graft.<sup>6</sup> Because of our patient's poor skin quality and nutritional status, multiple comorbidities, and wound depth to the bone, a skin graft would have had a high potential for failure and rib exposure.

In contrast to skin grafts, axial fasciocutaneous flaps furnish vascularized tissue, primary wound healing, and a cushion for underlying bone. Robust vascularity is the key factor for the viability and healing of fasciocutaneous flaps.<sup>4</sup> Adequate soft tissue coverage will prevent subsequent tissue thinning, with a risk of infection or erosion. We recommend an internal thoracic artery perforator-based fasciocutaneous flap as the optimum management for exposed and infected pacemakers when surrounded by an extensive cutaneous malignancy that requires excision. The availability of a multidisciplinary team comprising cardiology, infectious disease, cardiothoracic surgery, and reconstructive surgery was intrinsic to success.

## Conflicts of interest

None disclosed.

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