Cutaneous Abscess at the Pacemaker Implantation Site: Clinical and Therapeutic Considerations

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Abstract

Infections of cardiac implantable electronic devices (CIEDs) are uncommon but potentially life-threatening. We present the case of an 84-year-old man with a pacemaker, diabetes, and hypertension, who developed a painful, erythematous swelling over the device site. Laboratory workup showed elevated inflammatory markers. He was treated with intravenous antibiotics and underwent pacemaker relocation. Early recognition and complete device management are critical to prevent complications.

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Introduction:-

Cardiac arrhythmias are commonly managed using cardiac pacing systems [1]. With expanding indications, the number of cardiac implantable electronic devices (CIEDs) has grown substantially. Pacemakers remain the most frequently used, typically implanted in the left subclavian region within a subfascial pocket beneath the pectoralis major muscle. Due to their invasive nature, these devices carry risks of peri-procedural and post-procedural complications, including pocket infections. Infections can present in various forms, such as localized abscesses at the device site. Risk factors include diabetes, heart or renal failure, corticosteroid therapy, postoperative hematoma, lack of antibiotic prophylaxis, anticoagulation, prior CIED infection, or generator replacement [2]. Once a CIED infection is confirmed, complete hardware removal is generally recommended to prevent severe or recurrent complications [3].

Observation :

We report the case of an 84-year-old man with type 2 diabetes mellitus managed with oral antidiabetic agents, complete atrioventricular block with a pacemaker implanted in 2018, hypertension under treatment, and a prior cutaneous infection at the pacemaker site several months earlier. The patient presented with a painful swelling beneath the left clavicle evolving over one month, preceded by high fever, chills, and pronounced fatigue. Fifteen days before admission, he reported a flu-like syndrome.

On examination, heart rate was stable at 90 bpm, and auscultation revealed a loud systolic murmur throughout the heart. Dermatological evaluation revealed a poorly demarcated, erythematous, edematous, and pigmented plaque, warm and tender, with overlying skin detachment and palpable fluctuation (Figure 1). The lesion was located in the left subclavicular lateral thoracic region over the pacemaker, while lymph nodes were not enlarged.

Laboratory investigations showed hemoglobin 10.3 g/dL, white blood cells 6,270/mm³ with 4,600 neutrophils, C-reactive protein 46 mg/L, creatinine 9 mg/L (clearance 85 mL/min), potassium 4.4 mEq/L, and creatine phosphokinase 113 IU/L. Blood cultures (aerobic and anaerobic) and local aspiration yielded seropurulent fluid (Figure 2), but microbiological cultures were negative, likely due to immediate empirical antibiotic therapy. The patient received intravenous amoxicillin-clavulanate 1 g three times daily and ciprofloxacin 400 mg twice daily, supplemented with sugar-free vitamin C. Pacemaker relocation was subsequently performed to control the infection.

Discussion:

Pacemaker implantation techniques have improved to minimize complications [4]. The risk of infection after pacemaker implantation ranges from 0.5% to 1% in the first 6–12 months, increasing with device complexity [5]. Infection rates for implantable cardioverter-defibrillators (ICDs) are approximately 1.7% within six months and up to 9.5% after two years, with even higher rates for cardiac resynchronization therapy (CRT) devices [6,7]. Replacements and revisions, particularly in elderly patients with comorbidities, further increase infection risk.

Patients with CIED infections typically present with local inflammatory signs—swelling, erythema, warmth—at the device site. Systemic manifestations may include fever >38 °C, chills, night sweats, malaise, and weight loss; septic shock occurs in fewer than 10% of cases [8]. Symptoms and laboratory tests may sometimes be normal, and bacteremia can occur at any time during the device lifespan.

Confirmation of CIED infection, whether systemic or localized to the pocket, generally requires complete hardware removal, initiation of antibiotic therapy, and planning for re-implantation. Minor incisional or suture-related abscesses shortly after implantation that do not communicate with the pocket may be managed conservatively with antibiotics and careful follow-up [9]. Prompt and complete treatment is essential to reduce morbidity and mortality.

Conclusion:

To conclude, CIED infections are increasingly frequent and carry a high mortality risk if untreated. Diagnosis can be challenging, and potential involvement of other cardiac structures should be assessed. Definitive management requires complete device removal, which can be safely performed in specialized centers, while re-implantation is not always necessary.

Figure Legends:

Figure 1: Clinical presentation of a poorly demarcated, erythematous, edematous, and pigmented plaque over the left subclavicular region above the pacemaker, warm and tender with overlying skin detachment and palpable fluctuation.

Figure 2: Local aspiration of the pacemaker pocket yielding seropurulent fluid.

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