CASE REPORT

Journal of International Surgery and Clinical Medicine (*JISCM*) 2022, Volume 2, Number 2: 28-30
E-ISSN: 2807-7008

Published By :
Surgical Residency Program
Universitas Syiah Kuala

Management of late implantable cardiac device infection in the elderly patient: a case report

Ronald Winardi Kartika[1*]

[1]Thoracic Cardiac and Vascular Surgery, Faculty of Medicine and Health Science, Universitas Kristen Krida Wacana, Jakarta

*Corresponding to:
Ronald Winardi Kartika; Thoracic Cardiac and Vascular Surgery, Faculty of Medicine and Health Science, Universitas Kristen Krida Wacana, Jakarta;
ronald.kartika@ukrida.ac.id

Received: 2022-05-12
Accepted: 2022-07-30
Published: 2022-08-23

ABSTRACT

Introduction: Currently, the use of Cardiac Implantable Electronic Devices (CIED) is widely used, but in line with the increase in the use of CIEDs, there has also been an increase in the rate of complications. Infection accounts for about 1% of them. All of these were seen in chronically ill patients with multiple comorbid conditions within a few years of implantation. It has not become a standard treatment for infection in the pacemaker bag until now. This study aims to report an immunocompetent patient who developed a pacemaker pocket infection with *Escherichia coli* bacteria after more than 10 years post-implantation who was successfully treated by moving the bag more medial to sterilization on a pacemaker battery.
Case Report: We report an 89 year-old, elderly patient with sick sinus syndrome with a pacemaker pocket infection. The method we used was to explant the battery from the pacemaker and sterilize it with gas, the next day it was reassembled by moving the bag more medially. Loading of the vancomycin antibiotic was carried out for 14 days while still controlling the renal function
Conclusion: *Staphylococcus aureus* causes the majority of CIED infections, especially in immunocompromised elderly patients. Proper treatment of infected pacemaker pouches is necessary with minimal improvement on antibiotics. If left untreated, it can develop into endocarditis which has a high mortality rate.

Keywords: Cardiac implantable electronic devices, infected pocketed pace maker, elderly patient.
Cite This Article: Kartika, R.W. 2022. Management of late implantable cardiac device infection in the elderly patient: a case report. *Journal of International Surgery and Clinical Medicine* 2(2): 28-30. DOI : 10.51559/jiscm.v2i2.23

INTRODUCTION

In the elderly, there is often a decrease in the body's immunity due to the aging process. In the aging process, electrical damage to the heart often occurs, resulting in Sick Sinus Syndrome (SSS). In elderly patients with SSS, it is necessary to install a pacemaker, which if not getting the right treatment will lead to infection of the pacemaker pocket.[1]

Infection in pacemaker pouches accounts for approximately 1% of complications associated with the use of implanted cardiovascular electronic devices (CIED). The most common organism found in *Staphylococcus aureus*, with 50% being MRSA (methicillin-resistant *Staphylococcus aureus*) followed by *Escherichia coli* and *Staphylococcus epidermidis*.[2] Only about 2% of these are secondary to fungal infections.[1] Infection is of particular concern because, if neglected, it will result in complications with endocarditis. Only 5 cases were reported having generator pocket infection.[3]

In gerontology, there is often a decrease in the body's immune system, due to the aging process and lack of protein intake. This study aims to report an immunocompetent patient who developed a pacemaker pocket infection with Escherichia coli bacteria after more than 10 years post-implantation who was successfully treated by moving the bag more medial to sterilization on a pacemaker battery.[4]

CASE REPORT

A man, 89 years old, has been using a permanent pacemaker for the indication of Sick Sinus Syndrome (SSS) for 10 years. The patient came with complaints of a pacemaker protruded out from the pocket (**Figure 1**)

He underwent treatment for 2 weeks with wound dressing daily. The patient is hemodynamically stable and has no complaints of fever. During the treatment, the pacemaker pocket expels more pus (**Figure 2**).

Figure 1. Pacemaker Generator protruded out from pocket

The patient performed a pus culture/sensitivity in infected pocketed abscess with the results of *Escherichia coli* and received moxifloxacin tablets orally once a day for 14 days. The patient still complained of discharge and pacemaker pocket, so it was decided to do a debridement in the operating room. The chest X-ray when the patient was admitted to the hospital showed that the lead pacemaker was in a

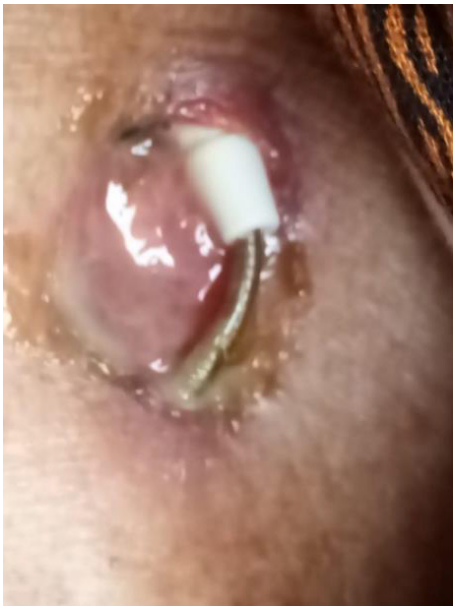

Figure 2. Infected Pace Maker Pocket

Figure 3. Chest X-ray before surgery (located in lateral side)

good position with the battery positioned towards the lateral side (**Figure 3**).

Patients diagnosed with SSS are still dependent on the pacemaker, so it was decided to keep the lead pacemaker in position. The patient underwent an explanation of the pacemaker battery and debridement pacemaker pocket with gentamycin wash. During this day a temporary pacemaker was installed. A cleaning and sterilization protocol was developed that includes washing CIEDs in enzymatic detergent, screw cap and set screw replacement, brushing, inspection, and sterilization in ethylene oxide. Validation testing was performed to assure compliance with accepted standards.

The next day, a new PPI bag was made which was located more medially and was

Figure 4. Chest X-ray after surgery (Generator PPI located more medial)

Figure 5. Move the pocket PPI from lateral to medial site

not related to the previously infected bag (**Figure 4**).

The patient received the antibiotic vancomycin for 14 days. When the patient was discharged on day 14, the wound was dry, there was no seroma or sign of infection. (**Figure 5**).

After the third month, patient control in OPD, and there were no complaints. The PPI has been well captured with good healing wound in pocket PPI.

DISCUSSION

The incidence of permanent pacemaker system infection is very rare, only between 0.3% and 12.6%. The most common infection usually involves a generator pouch infection (which appears two to five weeks after implantation). In addition, the infection can occur at the electrodes which occur on average 33 weeks after insertion). Lead infection is often associated with bacteremia and is usually associated with infective endocarditis. Septicemia is very rare (1–3%). 1-3 To our knowledge, the incidence of pacemaker endocarditis has not been reported.[5]

Manifestations of PPI infection with septicemia if the culture results are positive for two different bacteria, or a positive culture for one bacterium along with at least one clinical manifestation of septicemia (fever, chills, increased white blood cell count, sedimentation).[6] There are several predispositions for acute infection with pacemakers, including post-implantation pocket bleeding, erosion, necrosis, or infection. While chronic infection with pacemaker pockets is at risk in elderly patients, diabetes mellitus, thin skin, use of corticosteroids, intravenous catheters, neoplasms, and long-term use of anticoagulants. long.[7] In this patient, the bacterium *Escherichia coli* infects the pacemaker pouch. It is reported that the most common pacemaker pocket infection is *Staphylococcus epidermidis*.

Treatment of retrieval pacemaker infection of the entire infected pacemaker system including lead pacemaker and capsulectomy, followed by individualized antimicrobial therapy. In patients dependent on a pacemaker, the use of a temporary pacemaker is necessary while moving the pacemaker system. In this patient, because the patient is dependent on the pacemaker and the patient does not have the money to install a new pacemaker system on the contralateral side, it was decided to sterilize the pacemaker battery and make a new bag that is more medial and separate from the old bag. This method gives good results although postoperative intravenous antibiotics are absolutely necessary.[8,9]

There are several indications for removing the PPI cable from the epicardium, including infection of the PPI system leading to endocarditis. Many release techniques, including the conventional technique by using traction with a certain load on the lead pacemaker. It can also be done with the double snaring extraction through the femoral artery technique or assisted by using a pacemaker laser lead extraction.[10] A laser lead extraction is the laser technique employed to remove a pacemaker or defibrillator lead or leads from inside the heart. In this case, report, the patient did not have the

money to replace the entire pacemaker system (lead + battery).[11,12] We used the conventional technique by moving the pacemaker bag further away. medially treated with intravenous antibiotics for 14 days.

CONCLUSION

Staphylococcus aureus causes the majority of Cardiac Implantable Electronic Devices (CIED) infections, especially in immunocompromised elderly patients. Infected PPI pocketed is rare but needs a good management, so the recurrence might be prevented.

CONFLICT OF INTEREST

The author declared no conflict of interest in this article

FUNDING

No funding

ETHICAL CONSIDERATION

This study already got patient consent for publication

AUTHOR CONTRIBUTION

The author contributed equally to this study

REFERENCES

1. Choo MH, Holmes DR, Gersh BJ, Maloney JD, Merideth J, Pluth JR, et al. Permanent pacemaker infections: Characterization and management. *Am J Cardiol*. 1981;48(3):559–64. Available from: http://dx.doi.org/10.1016/0002-9149(81)90088-6
2. Goldman BS, Macgregor DC. Management of Infected Pacemaker Systems. *Clin Prog Pacing Electrophysiol*. 1984;2(3):220–35. Available from: http://dx.doi.org/10.1111/j.1540-8167.1984.tb01662.x
3. Bluhm G, Julander I, Levander-Lindgren M, Olin C. Septicaemia and Endocarditis — Uncommon But Serious Complications in Connection with Permanent Cardiac Pacing. *Scand J Thorac Cardiovasc Surg*. 1982;16(1):65–70. Available from: http://dx.doi.org/10.3109/14017438209100612
4. Peters G, Saborowski F, Locci R, Pulverer G. Investigations on staphylococcal infection of transvenous endocardial pacemaker electrodes. *Am Heart J*. 1984;108(2):359–65. Available from: http://dx.doi.org/10.1016/0002-8703(84)90625-2
5. Lamas GA, Orav EJ, Stambler BS, Ellenbogen KA, Sgarbossa EB, Huang SKS, et al. Quality of Life and Clinical Outcomes in Elderly Patients Treated with Ventricular Pacing as Compared with Dual-Chamber Pacing. *N Engl J Med*. 1998;338(16):1097–104. Available from: http://dx.doi.org/10.1056/nejm199804163381602
6. Ohm O-J, Breivik K. Patients with High-Grade Atrioventricular Block Treated and not Treated with a Pacemaker. *Acta Med Scand*. 2009;203(1–6):521–8. Available from: http://dx.doi.org/10.1111/j.0954-6820.1978.tb14919.x
7. Mond HG, Proclemer A. The 11th World Survey of Cardiac Pacing and Implantable Cardioverter-Defibrillators: Calendar Year 2009-A World Society of Arrhythmia's Project. *Pacing Clin Electrophysiol*. 2011;34(8):1013–27. Available from: http://dx.doi.org/10.1111/j.1540-8159.2011.03150.x
8. Nava S, Morales JL, Márquez MF, Barrera F, Gómez J, Colín L, et al. Reuse of Pacemakers. *Circulation*. 2013;127(11):1177–83. Available from: http://dx.doi.org/10.1161/circulationaha.113.001584
9. Sastry S, Rahman R, Yassin MH. Cardiac Implantable Electronic Device Infection: From an Infection Prevention Perspective. *Adv Prev Med*. 2015/10/13. 2015;2015:357087. Available from: https://pubmed.ncbi.nlm.nih.gov/26550494
10. Kennergen C. First European Experience Using Excimer Laser for the Extraction of Permanent Pacemaker Leads. *Pacing Clin Electrophysiol*. 1998;21(1):268–70. Available from: http://dx.doi.org/10.1111/j.1540-8159.1998.tb01102.x
11. Wilkoff BL, Byrd CL, Love CJ, Hayes DL, Sellers TD, Schaerf R, et al. Pacemaker lead extraction with the laser sheath: results of the pacing lead extraction with the excimer sheath (PLEXES) trial11No financial support was received for performing the procedures or collecting the data, or for data analysis. *J Am Coll Cardiol*. 1999;33(6):1671–6. Available from: http://dx.doi.org/10.1016/s0735-1097(99)00074-1
12. Okada A, Aizawa K, Tomita T, Yoshie K, Takeuchi T, Shoda M, et al. Successful transjugular extraction of a lead in front of the anterior scalene muscle by using snare technique. *J arrhythmia*. 2015/01/17. 2015;31(4):249–51. Available from: https://pubmed.ncbi.nlm.nih.gov/26336570