ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 02 | February - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CONTACT ALLERGIC DERMATITIS TO PACE MAKERS FOR THE HEART

Cardiology

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ABSTRACT

Allergic reaction to permanent pace makers are extremely rare, and the compound mostly used are titanium, nickel, and epoxy-resins (1), however to cobalt, mercury, silicon the usual reaction is infection at the allergy site (2-3-4-5), but here we present a case of dermatitis on the dorsal aspects of the hands away from the site of pace maker, for which patient has been applying steroids as advised by different dermatologises , but no thought of pace maker material allergy.

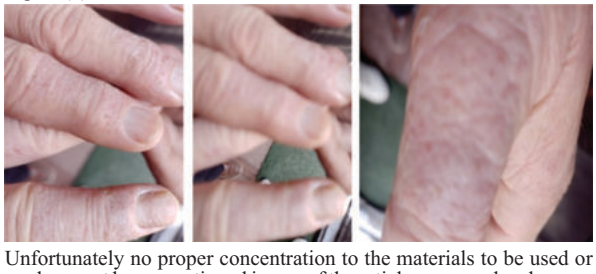
KEYWORDS

INTRODUCTION & CASE REPORT

Allergic reaction to pace maker are rare. It was first reported by Raque and goldsmith in 1970's in patient who developed eczematous dermatitis after 3 weeks of implantation (1). And in this case silicon was the allergen. Since then many cases have been reported. Dery et al (6) in 2002 analysed 21 cases reported worldwide and by then, 5 of them were allergic to nickel, 4 to titanium, 3 to epoxy and other cases were related to cobalt, chromium, mercury, silicon, cadamium and prylone, but in 6 patients the test was negative, which is not surprising as epidermal test with titanium have very low sensitivity (7).

A diabetic patient 74 years old on metformin 500MG BD presented to me with dermatis on the dorsum of the 2 to 3 fingers adjoining the thumb of the right hand, and inclusion of the latter (figure 1) left hand dermatitis was not pictureseque (figure 1,2,3). He was otherwise healthy , On history taking he mentioned that he got a pace maker inserted due to slow heart rate on the left on the chest and the dermatitis appeared 6 months after that, and is continuing for last 2 years and patient is applying topical steroid off and on to get relief. Patient's all the blood parameters were normal except eosinophilia, hence serum IGE came out to be 1740 I/u per ml. So a diagnosis of allergic reaction to the components of the pace maker was kept in mind. Patch test to the component like titanium , mercury, silicon, epoxy resin, cadmium, were patch tested. Cobalt however could not be tested as it was not available being radioactive material. Nickel & Epoxy resin were patch test positive and most probably were the cause of this allergy to pace maker.

The black patch in figure 2 is due to concentrated nickel, sulphate, which becomes solid on oxidation and causes ulcer on the skin and that picture is also taken separately. Hence we used the concentration of 250gms per litter which did not cause ulcer and gave adequate results. Figure (1) below



Unfortunately no proper concentration to the materials to be used or use have not been mentioned in any of the articles screened and we are using nickel for the patch test for the first time because of pace maker; otherwise nickel allergy seen by dermatologist is a clinical diagnosis and easily diagnosed and can be avoided for use, or after a few years it goes off its own.

Epoxy resin was used as such ; it is available in two tubes which are mixed and applied. Even other components used were as such without any dilution.

DISCUSSION

As has already been mentioned that allergic reaction to the components of the pace maker is very very rare (1). Usually the allergic reaction occurred about 3-4 months after the insertion of the device and only at the site of insertion especially in an oozing form & infection and the biopsy showed granulomatious reaction. Titanium is usually quite inert, but epoxy resins, cobalt ,nickel, chromium and silicon are more allergenic, nickel being the most allergenic, but nickel allergy can die of its own with time as we have often seen contact dermatitis to wrist watch back cover goes away with time. May be a few months or a few years later and has been seen by the aurhor. Serum IGE level may be due to allergy its self, or any kind of other allergy like nasal or bronchial allergy.

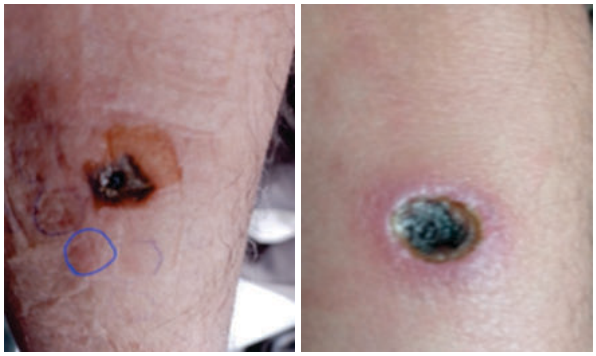
Ideally as of today since this is type (IV) reaction (4). IGE level should not be as high as also seen by some other authors. IGE should be more raised in humoral immunity.

On many occasions the pace maker have been taken out and replaced on the contralateral site. Or, pace makers have been covered with polytetraflouru ethylene membrane (8) or wth gold coating (9). Even negative test may not indicate that allergy is not there especially with lowly allergenic titanium; But the possibility of allergy to some component, but this is not possible if an indication for the pace maker is a must and it has to be replaced with some other material (6). Topical steroids have been used in most cases, but they have their own complications.

A pace maker generator covered with gold, silicon or PTEF manufactured during the procedure is the better option ii (8,9,10,11,12). A device covered with gold is the best as of today, but there is only one manufacturer in the world, silicon is however is least used today.

In the present case eczema away from the pacer site is perhaps the 1st one reported and it can happen as mild dermatitis at the site, dissemination to the peripheral parts , and in this case the hands, the lesions lasting 2 years and patient applying topical steroids.

The patch test to various components described. Above has not been very good. But the author can see positive test to nickel and epoxy resin. A black spot 1cm/1cm can be seen due to chrome burning the skin which can be seen in the photograph taken five days later. Figure (2)



No 2 and 3 show nickel and epoxy resin put in very minute quantity and diluted it has not created the mess. No. 1 shows positive patch test to nickel in very Dilute (1*5) concentration

Acknowledgments:

1. Gippy Jain , Bir Industries, Industrial Area (jalandhar) (for Providing Some Of The Material For Test
2. Rahul Verma (m.sc) Computer Science (for Typing This Article Nicely)

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