

Letter to the Editor

A case of allergic contact dermatitis following transcatheter closure of patent ductus arteriosus using Amplatzer ductal occluder

Kye Hun Kim, Jong Chun Park*, Nam Sik Yoon, Jae Youn Moon, Young Joon Hong, Hyung Wook Park, Ju Han Kim, Youngkeun Ahn, Myung Ho Jeong, Jeong Gwan Cho, Jung Chae Kang

The Heart Center of Chonnam National University Hospital, Gwangju, Republic of Korea

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1. Introduction

Although percutaneous transcatheter closure of patent ductus arteriosus (PDA) is a new and well established alternative to surgical treatment, several problems associated with the device may occur [1]. We report a 31-year-old female case of allergic contact dermatitis associated with nickel hypersensitivity following a successful percutaneous transcatheter closure of PDA using nickel-containing Amplatzer ductal occluder (ADO).

2. Case report

A 31-year-old female patient with no known history of previous medical or allergic disease presented with dyspnea on exertion of NYHA functional class II. Echocardiography revealed enlarged left ventricular and atrial size due to abnormal shunt flow from descending thoracic aorta to pulmonary artery with peak velocity of 5.2 m/s through PDA. Angiography using multi-detector 3 dimensional computed tomography revealed PDA with the 5.9 mm sized diameter of the narrowest portion (Fig. 1-A). Percutaneous transcatheter closure of PDA using 10/8 mm sized ADO was performed successfully without residual shunt (Fig. 1-B). The patient complained of generalized pruritic erythematous maculopapular skin eruption on the next day after the procedure

(Fig. 2-A). Although the patient has no known previous allergic history, hypersensitivity reaction to nickel-containing ADO was suspected. The patient was started on prednisone 40 mg per day and the skin lesion disappeared after several days of medication. Allergic skin patch test showed strong positive reaction to nickel consistent with a type IV hypersensitivity reaction (Fig. 2-B). Therefore, we concluded that allergic contact dermatitis was caused by hypersensitivity reaction to nickel-containing ADO device in this patient. The patient continued medication for more than 3 months. The skin lesion did not recur after the cessation of the medication.

3. Discussion

Percutaneous transcatheter closure with various occluders or coils is now a well accepted treatment for PDA as an alternative to surgery. ADO is a self-expandable device made from a nitinol wire mesh to close moderate to large sized PDA. Nitinol wire mesh is composed of an alloy of 55% nickel and 45% titanium, and has super-elastic properties that provide shape memory. Although the incidence of dermal hypersensitivity to nickel is approximately 15% of the general population, the incidence of allergic reaction to nickel-containing medical devices was poorly studied [1]. Recently, Iijima et al. reported that the incidence of metallic allergy to coronary stent was 9% and half of them showed a positive patch test to nickel [2]. According to their study, positive patch test predicts recurrent restenosis following percutaneous coronary intervention for in-stent restenosis, but the history of metallic allergy did not relate with restenosis [2].

* Corresponding author. Heart Center of Chonnam National University Hospital, 8 Hak Dong, Donggu, Gwangju, Republic of Korea, 501-757. Tel.: +82 62 220 6241; fax: +82 62 227 4760.

E-mail address: jcpark54@hanmail.net (J.C. Park).

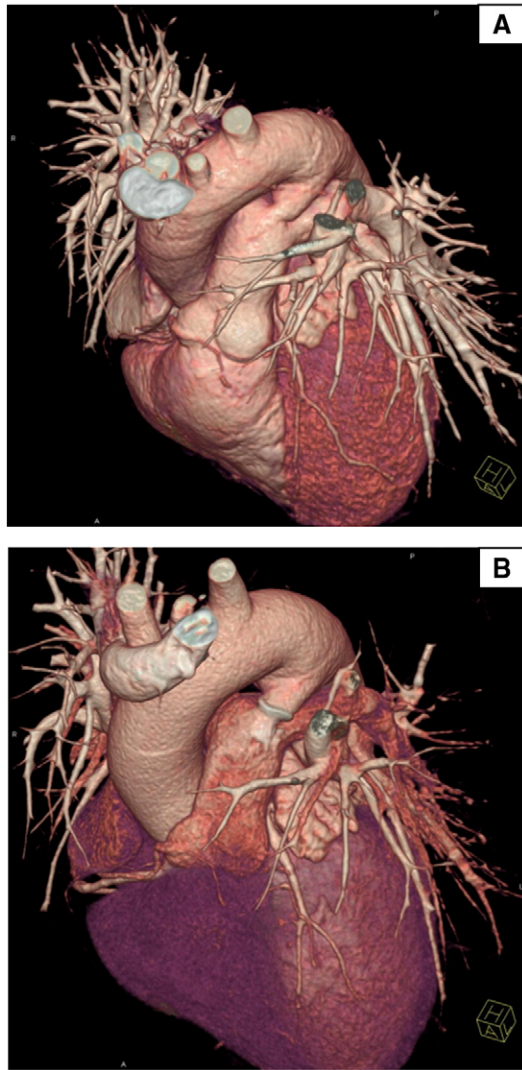


Fig. 1. Angiography using multi-detector 3 dimensional computed tomography. Patent ductus arteriosus with the 5.9 mm sized diameter of the narrowest portion (A) was successfully treated by percutaneous transcatheter occlusion using Amplatzer ductal occluder (B).

Although positive patch test to nickel-containing devices is not uncommon, adverse allergic events following successful deployment of nickel-containing ADO for PDA are rare. There were only few case reports regarding hypersensitivity reactions to nickel-containing medical devices such as orthodontics or endovascular stent graft [3,4]. ADO has excellent bio-compatibility and thus hypersensitivity reaction to ADO is extremely rare. Lai et al. reported a case of pericarditis caused by local reaction to nickel-containing ADO [5]. To the best of our knowledge, however, there is no previous report on systemic contact dermatitis caused by type IV hypersensitivity reaction to nickel-containing ADO. Interventional cardiologist should consider this potential problem before transcatheter procedure using nickel-containing devices. Careful history taking of nickel allergy or pre-procedural skin patch test may reduce this possible problem.

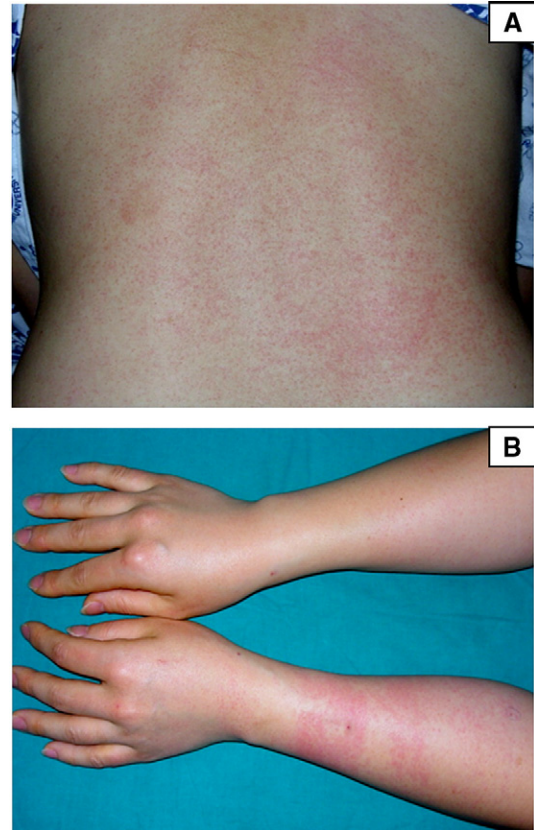


Fig. 2. Generalized pruritic erythematous maculo-papular skin eruption developed on the next day after the device closure (A) and skin patch test for nickel on the left forearm showed strong positive reaction (B).

According to the study of Ries et al., the release of nickel after implantation of the Amplatzer device reached to its peak level at 1 month and continued more than 3 months in serum [6]. Long-term steroid therapy more than 3 months may be reasonable to the patient who developed nickel-elicited systemic contact dermatitis following implantation of ADO.

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