Nickel Allergy, Amplatzer Atrial Septal Occluder Device, and the Risk of Kounis Syndrome

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To the editor:

In a very interesting report published in this journal¹ concerning a 52-year-old woman with an Amplatzer atrial septal occluder device implantation, the authors reported that the patient experienced repeated attacks of severe, burning left-sided chest pain which disappeared following explantation of the device. The Amplatzer occluder device is made from nitinol which is a nickel-titanium alloy. Although the electrocardiographic findings during the chest pain attacks have not been given, the patient's chest pain is characteristic for Kounis hypersensitivity coronary syndrome.²

It is known that hypersensitivity reactions to nickel occur in up to 17.2% of the population and are the most frequent cause of allergic contact dermatitis.³ In patients undergoing percutaneous atrial septal defect and patent foramen ovale closure, nickel allergy can be the cause of systemic reactions such as chest discomfort, palpitation, and migraine headache with or without aura.⁴ Local nickel allergy from intracardiac devices and subsequent systemic allergic reactions confirmed by patch tests as an allergy to nitinol have necessitated the removal of these devices.⁵

Reports concerning hypersensitivity reactions to various metals used in orthodontics have also been published and nickel was the metal provoking the most severe responses.⁶ Delayed hypersensitivity reactions to nickel and molybdenum might be part of the inflammatory process and one of the triggering factors for development of in-stent restenosis.⁷ The rate of nickel allergy following initial stent implantation has been estimated to be 9.2%.⁸

Skin clips containing nickel, chromium, molybdenum, cobalt, and titanium can induce allergic reactions and may be the cause of delayed wound healing.⁹ It is known that the metal strut in coronary stents is made from 316L stainless

steel containing nickel, chromium, manganese, titanium, and molybdenum.

Based on the above clinical observations, we believe that nickel allergy history should be ascertained in all patients prior to undergoing Amplatzer device or coronary stent implantation. Indeed, newer stent devices (eg, Endeavor with zotarolimus (Medtronic, Minneapolis, MN) and Xience V with everolimus eluting drugs (Abbott Laboratories, Abbott Park, IL)), avoid nickel struts and use cobalt-chromium struts which are less allergenic, thus following our recommendations.¹⁰ The same should be applied in the newer Amplatzer atrial septal occluder devices.

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