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Title: An immune reaction caused by silicone breast implants

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CASE REPORT

A 53-year-old woman with no atopic background was referred for a persistent diffuse, inflammatory and itchy skin lesions which had started the previous year on her right breast and secondarily spread to the flanks, the arms, the neck, and eventually to the face (**Figure 1 – A, B, C**). A skin biopsy was consistent with the clinical diagnosis of eczema.

Owing to a history of breast augmentation surgery 16 years before with a retropectoral Inamed silicone gel-filled round breast implants (Allergan, Dublin, Ireland) and to the chronological and spatial pattern of skin lesions, a breast ultrasound was performed and identified a possible intracapsular rupture of the right breast implant, confirmed by a breast MRI (**Figure 2 - A**). Explantation of both implants was performed and confirmed an important intracapsular rupture of the right implant (**Figure 2 - B**). A few days after surgery, breast's skin lesions began to subside and eventually healed completely (**Figure 1 - D**) while other lesions faded as well.

Suspecting allergic contact dermatitis (ACD) to the implants' constituents, patch-tests were performed on upper back using IQ Ultra chambers (Chemotechnique Diagnostics, Vellinge, Sweden) occluded for two days with Opertape (Iberhospitex, Innovative Health Technologies, Barcelona, Spain). Tests were conducted with the European baseline series along with a large portion of the ruptured breast implant shell and with the internal silicone gel "as is", ammonium tetrachloroplatinate (0.25% aq.), 1,3-diphenylguanidine and N(cyclohexylthio)phtalimide (1% pet.), thiourea (0.1% pet.), carba mix (3% pet.), two self-adherent soft silicone dressings, and dimethicone, polysilicone, and cyclopentasiloxane (personal collection), and read on day (D2) and D4 according to the ESCD recommendations¹. No positive reaction was observed.

At three months postoperative, no skin relapse was observed on the breasts or elsewhere on the patient's skin.

DISCUSSION

Silicones, polymer of siloxanes, encompass a family of high performance materials, used in thousands of products in a wide variety of fields, including healthcare.

Several cases of ACD to silicone have been published, including to a continuous positive airway pressure mask² and to a toe separator³, with positive patch tests to the silicone used in these devices. Regarding implanted medical devices, cases of ACD proved by positive patch tests to silicone are scarce. Allergy to a pacemaker has been reported⁴, with negative standard and generic silicone patch tests but with slightly positive patch tests with silicone containing-components provided by the manufacturer. Of interest, suspected ACD to silicone may be related to other components used during silicone manufacturing instead of silicone itself⁵.

Silicone breast implants have been used in reconstructive and aesthetic surgery for almost 60 years. Currently, most silicone prostheses are composed of a barrier shell and of a gel filler. Cases of suspected ACD caused by breast implants have been reported since 1996⁶⁻⁹. Eczematous lesions appeared on the breasts a few to several years after the surgery and the best treatment to obtain a resolution of the dermatitis was the removal of the implants in most cases. Most of the time, no allergy testing was performed. In one questionable case, the patient displayed allergy to constituents of rubber (without assessed relevance)⁷.

Of note, cases of nummular eczema have been published after breast implants surgery following breast cancer treatment with a complete resolution with the use of topical

steroids¹⁰. The authors hypothesized that the rash was not caused by immunological mechanisms, but by structural changes of the skin due to prior surgeries.

In our case, patch-tests yielded no positive results, therefore a type IV reaction cannot be claimed. An autoimmune/inflammatory reaction induced by an internal exposure to silicone, as it has been described for various metal implants through their immune adjuvant properties, can be suspected in susceptible patients¹¹. Furthermore, we cannot exclude that silicone degradation products may have promoted protein denaturation and may have activated the innate immune system, thus perpetuating a chronic pro-inflammatory response of the local tissue.

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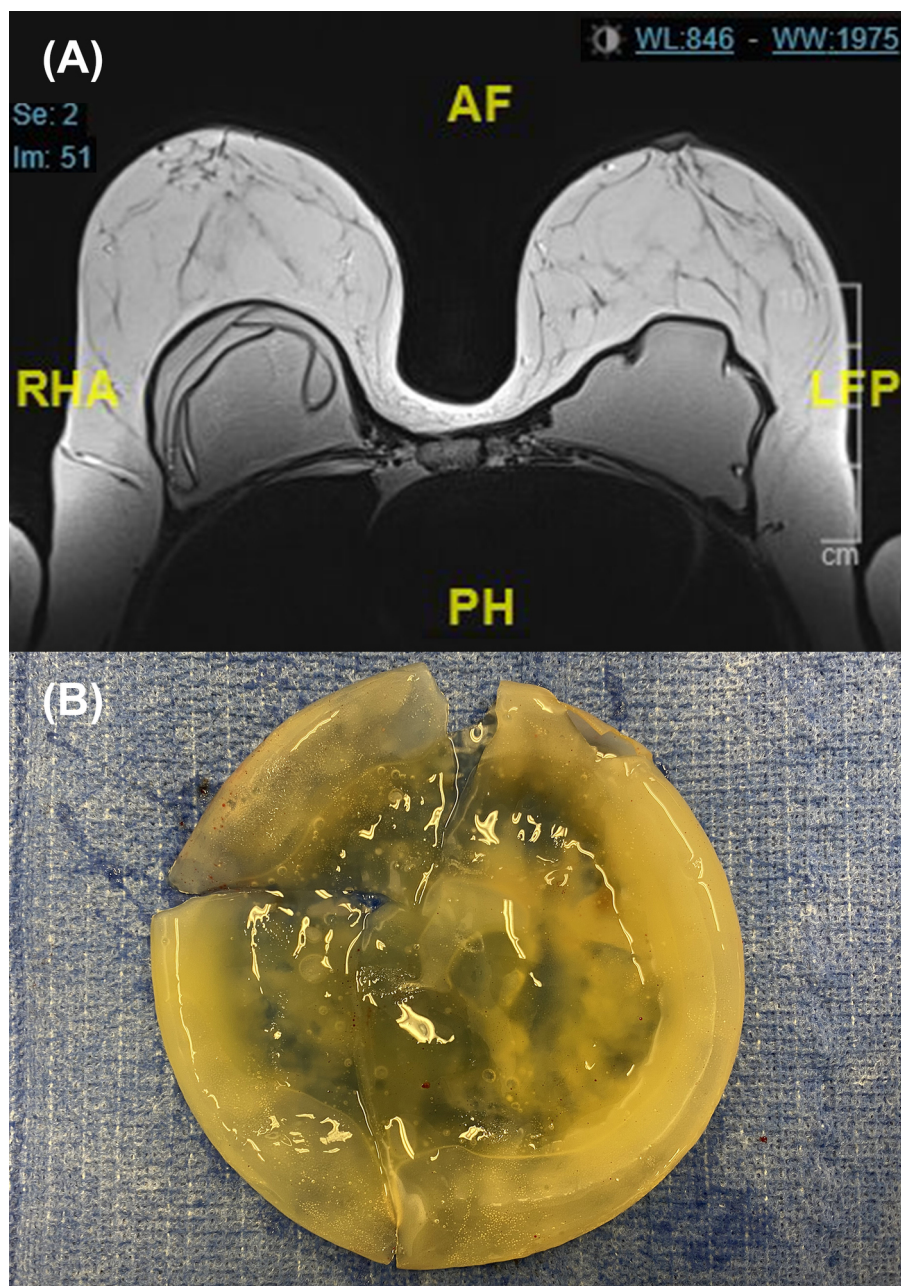
FIGURE LEGENDS

Figure 1: (A) persistent, diffuse, erythematous, and pruriginous lesions of eczema of the breasts, (B) the neck, (C) and the flanks; (D) almost complete resolution of the symptoms two months after the breast implants explantation

Figure 2: (A) MRI image showing a linguin sign, a sign of intra-capsular rupture, of the right breast-implant; (B) post-operative view of the ruptured right implant



COD_13936_Figure 1 - protheses mammaires.jpg



COD_13936_Figure 2 - protheses mammaires.jpg