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CASE REPORT
Cosmetic

Successful Treatment of SIADH after Removal of Ruptured Breast Implants

Alice C. Thuerlimann, MD*
Jeremy Morel, MD†
Pierre-Yves Martin, MD‡
Daniel F. Kalbermatten, MD, PhD*

Summary: Local adverse reactions to breast implants and systemic reactions, mostly autoinflammatory, are numerously described in the literature. A patient presented at our institution with severe neurologic symptoms, including confusion and phasic troubles due to severe hyponatremia as part of syndrome of inappropriate antidiuretic hormone secretion (SIADH). Common etiologies for SIADH, primarily malignancy and central nervous system disturbances, have been ruled out by imaging. On the computed tomography scan of the thorax and abdomen, several masses were found in the pectoral region, inferior to the sternum and in the left axilla that were biopsied and verified as silicone. While evaluating the patient's medical history, the patient remembered having undergone breast augmentation with silicone implants several decades ago. The only explanation left for the persisting SIADH was her ruptured silicone implants, causing an inflammatory systemic reaction. Literature was searched, and one abstract was found, in which a woman presenting with SIADH was treated successfully after removal of her silicone breast implants. We offered the same treatment to our patient, and siliconomas were removed through a bilateral inframammary approach as well as axillary on the left. There were no complications encountered. Postoperatively, the patient's hyponatremia improved and normalized 1 month later even without hydric restriction. This potential form of etiology and treatment of SIADH is a novelty in the medical literature. Surgical removal of dispersed silicone is presumed to be the cure for this syndrome. It represents a diagnosis of exclusion after more life-threatening causes, such as central nervous system disturbances and malignancies, have been ruled out. *(Plast Reconstr Surg Glob Open 2024; 12:e5591; doi: 10.1097/GOX.0000000000005591; Published online 20 February 2024.)*

Since the introduction of breast implants in the 1960s many related complications and systemic effects have been reported.[1] The syndrome of inappropriate antidiuretic hormone secretion (SIADH) is paraneoplastic and has so far been described only once as a consequence of ruptured silicone implants.[2] The pathophysiology involves a continued secretion or action of arginine vasopressin despite a normal or increased plasma volume, resulting in impaired water excretion.[3]

SIADH is caused by inappropriate hypersecretion of antidiuretic harmone from the hypothalamus, or by an ectopic production by a tumor.[4] Causes of the central nervous system include stroke, hemorrhage, infection, trauma, and psychosis.[4,5] The most common tumor associated with ectopic antidiuretic harmone production is small cell carcinoma of the lung.[5,6]

The female patient in this case report was diagnosed with symptomatic hyponatremia with SIADH, for which the only plausible explanation remained her ruptured silicone implants. She was treated by ablation of all dispersed silicone, representing no other episode of symptomatic hyponatremia until 1 year postoperative. This case report has been reported in line with the SCARE (Surgical Case Report) criteria.[7]

CASE REPORT

The 70-year-old female patient was brought to the emergency department by her husband in March 2021 with a new onset of confusion and disorientation. She was previously healthy, taking no regular medication, and slightly underweight, with a body mass index of 17.7 kg per m^2. Symptoms were preceded by headache, diarrhea, and vomiting, which started 4 days beforehand.

*From *Plastic, Reconstructive and Aesthetic Surgery, University Hospital of Geneva, Geneva, Switzerland; †Internal Medicine, Private Practice in Geneva, Geneva, Switzerland; and ‡Nephrology and Hypertension, University Hospital of Geneva, Geneva, Switzerland.*

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With new onset of disorientation, a computed axial tomography (CAT) scan of the crane cranium was performed and intracranial hemorrhage or a space occupying lesion was ruled out. Initial blood tests showed a severe hyponatremia (110 mmol/L) with metabolic acidosis and hypokalemia. Renal function was normal, with urine highly concentrated.

Unexplained SIADH remained the leading diagnosis and search for occult neoplasm by imaging was indicated. CAT scan of the thorax and abdomen with intravenous contrast showed subcutaneous multiloculated masses in the pectoral and presternal region (Fig. 1). The biggest mass was located below the xyphoid, with a dimension of 7 × 4 cm, and its biopsy showed gelatinous material compatible with silicone. In the left axilla, two infra centimetric masses were identified. There were no malignancy-suspect changes of the internal organs.

The patient's surgical history confirmed bilateral breast augmentation with silicone implants in 1983. No changes in aesthetic appearance or pain were noted in the past 37 years; therefore, no imaging had been performed.

With improved general condition, the patient was discharged home under regular follow-up by her general practitioner. Sodium levels remained low (132 mmol/L) despite a hydric restriction of 500–700 mL per day. On examination, the rather slim patient had visible and well palpable masses in the pectoral and sternal region, as well as in the left axilla (Fig. 2).

We consented her for removal of all palpable foreign bodies under general anesthesia. She was placed supine, with arms in abduction, and antibiotic prophylaxis was administered (cefuroxime IV). Incisions were performed in the inframammary folds bilaterally. The scar tissue capsule in the epipectoral was well circumscribed and distinguishable, and on opening it, liquid silicone and thin silicone shells were liberated and sent for pathological workup. The sternal mass was removed entirely after prolongation of the left inframammary incision, and the left axillary masses were removed through a retro pectoral incision. Totally, four drains under aspiration were placed in the surgical cavity, two on each thoracic side. Surgical incisions were sutured in a layered fashion with Vicryl in the deep plane, dermal and running intradermal suture with Monocryl.

Antibiotic prophylaxis was continued for 24 hours. All drains were removed before discharge. Baseline sodium at the day of surgery was slightly low (133 mmol/L) and normalized until day 7 (136 mmol/L). Hemoglobin controls were stable.

Initial hydric restriction of 750 mL per day was increased and abandoned 1 month later, with sodium at 137 mmol/L. Sodium levels were again at 129 and 127 mmol/L, when she had a very painful chalazion of the right upper eyelid, which lasted for 3 months. Although she was asymptomatic regarding the hyponatremia, she restricted her hydration. With regression of the infection, the sodium normalized again. At the 1-year control, the medial part of the left inframammary fold scar was hypertrophic (Fig. 2). After an injection of corticosteroid (Kenacort; dose: 40 mg/mL), the scar flattened completely. The patient was otherwise satisfied with the postoperative result, with no desire for aesthetic improvement (Fig. 3).

DISCUSSION

SIADH is usually associated with diseases of the central nervous system or malignant tumors.[4,5] Based on this case, we hypothesize that it can be caused by a foreign body such as dispersed silicone. Looking retrospectively, the patient had experienced SIADH before and during hospitalization for ophthalmic Zona, receiving intravenous acyclovir. The patient probably has a predisposition for SIADH in any context of an infection. Likewise, mild hyponatremia presented after the removal of the silicone implants, when the patient had a chalazion.

As a matter of fact, the patient's hyponatremia stabilized at a normal level, even after abandoning hydric

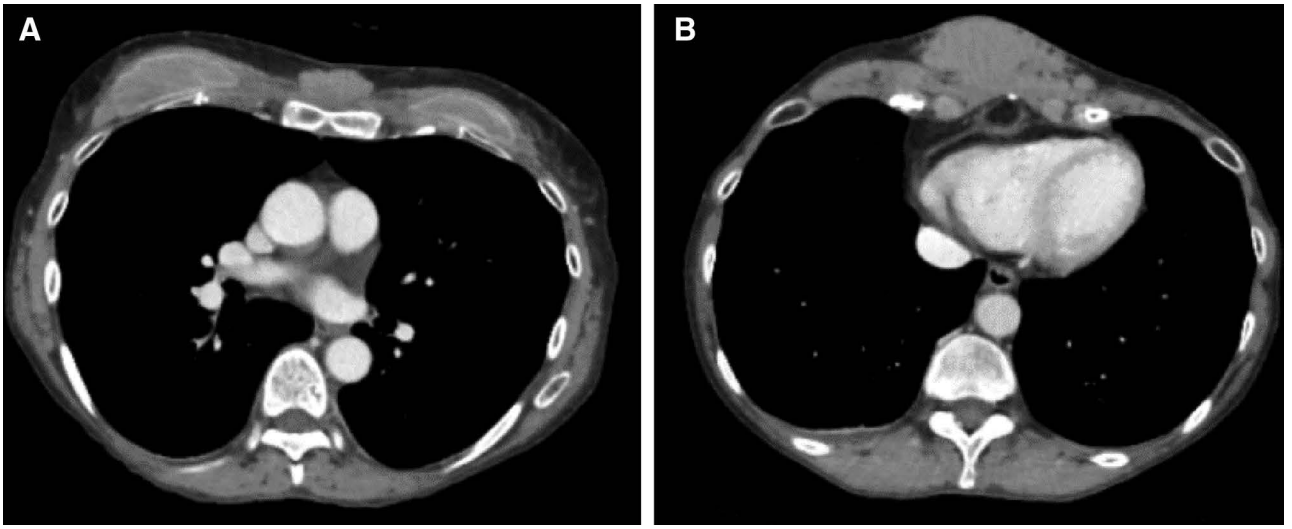

Fig. 1. Transverse CAT scan images of the thorax with ruptured silicone implants and siliconomas. A, Transverse section at the level of Th 6. B, transverse section at the level of Th 10.

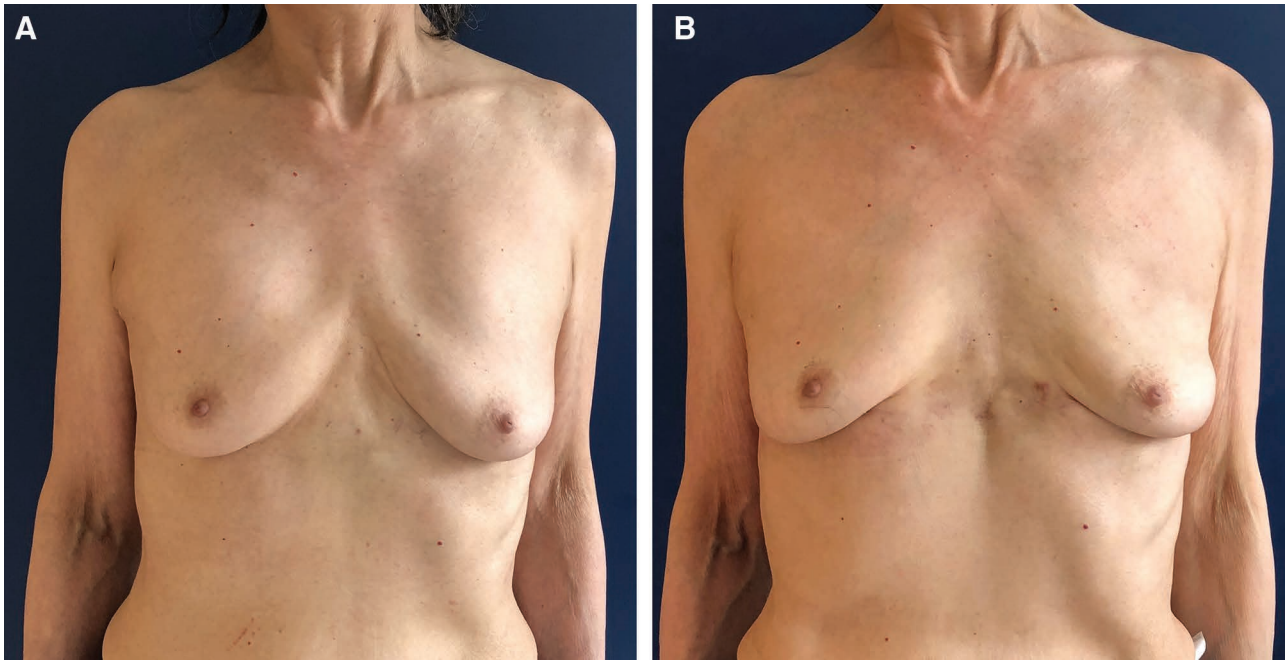

Fig. 2. Anterior view of the patient's thorax. A, Preoperative. B, 12 months postoperative (before corticosteroid infiltration).

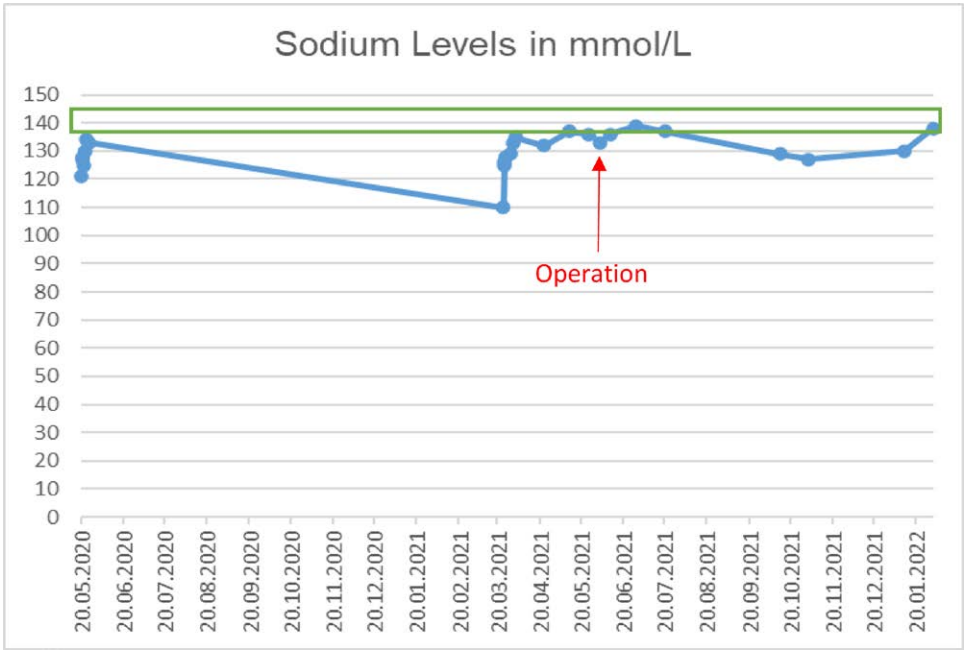

Fig. 3. Sodium levels over the period of record. Reference range is marked between 136 mmol/L and 144 mmol/L.

restriction, after removal of the silicone. We assume that the foreign material represented a constant source for latent systemic inflammation. Indeed, chronic infection is known to cause SIADH via an increase in IL-6 and IFN-β,[8] although we did not measure any elevated C-reactive protein or leucocytosis during the episodes of hyponatremia. Any additional inflammatory stimulus (such as ophthalmic zona, a chalazion, or a gastrointestinal viral infection) might cause a decompensation, leading to symptomatic hyponatremia. In this case, it was not possible to determine more precisely the specific cause–effect role of each hypothetical cause, which is a limitation of this report.

This case is only the second one described in the literature. The abstract published by Joseph Zeman (Lung Cancer, 2015[2]) reports on a 64-year-old woman with severe

hyponatremia after bilateral prophylactic mastectomy and reconstruction with breast implants. The computed tomography demonstrated ruptured breast implants as well as bilateral axillary lymphadenopathy, internal mammary chain lymph nodes, and small pulmonary nodes. Only explantation of implants without additional biopsies or removal of lymph nodes is described. Thereupon, her hyponatremia resolved immediately. Interestingly, there was also resolution of lymphadenopathies and pulmonary nodes in the repeat computed tomography.

We evaluated performing a thoracic CAT scan during the episode of hyponatremia, at 5 months postoperatively, when the chalazion appeared. Because sodium levels normalized shortly, we refrained from imaging in an asymptomatic patient.

Based on the experience with this case and the one published before, we hypothesize that a surgical intervention can be offered for this type of SIADH being caused by a foreign body. We emphasize, though, that in any case, more health-threatening causes should be searched because the implants are only a diagnosis of exclusion.

Alice C. Thuerlimann, MD
Rue Gabreille-Perret-Gentil 4
1211 Genève 14
Switzerland
E-mail: alice.thuerlimann@gmail.com

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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