

Hypercalcemia Secondary to Silicone Breast Implant Rupture: A Rare Entity to Keep in Mind

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Hypercalcemia is often an incidental finding accompanying a nonspecific clinical presentation. Depending on the level of calcium overload, symptoms can range from muscle weakness, polyuria, and thirst, to cognitive dysfunction, renal impairment, and pancreatitis. Life-threatening conditions, such as dysrhythmias and cardiomyopathies, can be seen in severe cases. Although related to several underlying entities, as much as 90% of cases are due to primary hyperparathyroidism or malignancy.¹

After actively managing the elevated calcium levels, and if hyperparathyroidism and malignancy have been ruled out, attention should be directed toward identifying less common causes of this electrolyte disturbance. A rare and scarcely documented cause of hypercalcemia is the ectopic production of 1,25-dihydroxy vitamin D (or calcitriol), originating from macrophage-driven granulomatous reactions to foreign bodies, such as silicone or (poly)methyl methacrylate. Hypercalcemia results from calcitriol-induced increase in calcium absorption from the gut and increased bone reabsorption.² Visnyei et al.³ and Agrawal et al.⁴ presented separate cases where 2 patients with extensive silicone injections, as part of male-to-female gender reassignment procedures, presented with symptoms and laboratory results consistent with calcitriol-mediated hypercalcemia. In both cases, diagnosis was confirmed by regional lymph node biopsy.

We present a case of a 74-year-old female with a history of hypertension, transient ischemic attacks, diabetes, and coronary artery disease. She presented to the emergency department with polyuria, fatigue, mild confusion, malaise, and a recent episode of syncope. She was found to have a serum calcium level of 14.0 mg/dL (normal, 8.8–10.3 mg/dL), initially managed with fluid resuscitation and calcitonin. Besides her persistently elevated calcium levels, more thorough laboratory studies showed low parathyroid hormone levels and elevated 1,25-dihydroxy vitamin D, as well as high creatinine, suggestive of acute kidney injury secondary to hypercalcemia. Given these findings, and her previous history of



Fig. 1. Bilateral silicone gel implants, with calcification of shells and rupture.

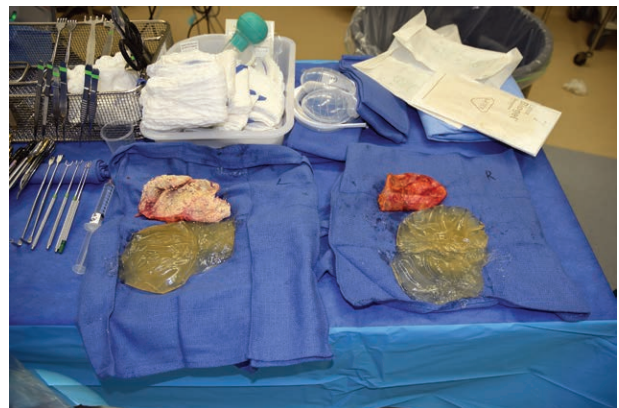


Fig. 2. Implants at the time of explantation.

breast implants, focus was directed to ruling out vitamin D-producing granulomatous disease. Ultrasound and computed tomography scans were ordered, revealing marked calcifications, as well as silicone-consistent densities beyond capsules, suggesting bilateral implant rupture (Fig. 1). After consulting with the Plastic Surgery department, a decision to remove implants was made (Fig. 2).

Following successful explantation, patient continued to recover and was discharged on postoperative day 2. On

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subsequent follow-ups, her calcium levels have consistently remained within normal range.

Even though this is still a rare and not well-documented entity, the increasing demand of silicone injections, fillers, and implants for body contouring procedures, especially in the transgender community, could result in an increased incidence of granuloma-induced, vitamin D-dependent hypercalcemia. In our opinion, this diagnosis should be considered in patients with a history of cosmetic surgery presenting with idiopathic persistent hypercalcemia.

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DISCLOSURE

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REFERENCES

1. Walsh J, Gittoes N, Selby P; Society for Endocrinology Clinical Committee. Society for Endocrinology Endocrine Emergency Guidance: emergency management of acute hypercalcaemia in adult patients. *Endocr Connect*. 2016;5:G9–G11.
2. Hindi SM, Wang Y, Jones KD, et al. A case of hypercalcemia and overexpression of CYP27B1 in skeletal muscle lesions in a patient with HIV infection after cosmetic injections with polymethylmethacrylate (PMMA) for wasting. *Calcif Tissue Int*. 2015;97:634–639.
3. Visnyei K, Samuel M, Heacock L, et al. Hypercalcemia in a male-to-female transgender patient after body contouring injections: a case report. *J Med Case Rep*. 2014;8:71.
4. Agrawal N, Altiner S, Mezitis NH, et al. Silicone-induced granuloma after injection for cosmetic purposes: a rare entity of calcitriol-mediated hypercalcemia. *Case Rep Med*. 2013;2013:807292.