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**Letter**

**Gluteal silicone injections leading to extensive filler migration with induration and arthralgia**

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**Abstract**

Silicone injections have been used for cosmetic soft tissue augmentation for over five decades [1] with documented consequences both systemic and dermatologic. We present a case of extensive filler migration causing bilateral lower extremity woody induration in a 53 year old woman. She presented with a multi-year history of progressive joint stiffening at the knees, accompanied by induration and pain of the bilateral lower extremities. The patient had received two injections of an unknown substance placed into her bilateral buttocks 11 years prior. MRI indicated an infiltrative process of both lower extremities and pathology was consistent with migration of injected tissue augmentation material, most likely silicone. Owing to the extent of involvement the patient was started on a trial of doxycycline 100 mg PO BID.

**Key Words: Silicone injections, filler migration**

**Case synopsis**

A 53 year old woman presented to the Bellevue Dermatology Outpatient unit for progressive joint stiffening of the knees accompanied by induration and pain in the soft tissue of both lower extremities. These clinical findings had been present for several years and the patient had previously been evaluated by both rheumatology and infectious disease clinics. The patient stated that the symptoms began after a cat bite in the area of her left leg years earlier. She was treated at that time with oral antibiotics, presumably for a wound infection. The patient had no other significant past medical history, denied prior procedures or surgery, was on no medication, and had no family history of connective tissue disease, arthritis, or skin disease. Results from infectious disease and rheumatologic evaluations had been negative with the exception of a rising ANA and an MRI finding of an infiltrative process in both lower extremities.

On further questioning, it came to light that 11 years prior, the patient had been given two injections of an unknown substance into her bilateral buttocks by a non-medical-professional in an effort to increase gluteal girth. The patient does not know the name of

the substance that was injected and, given the time between events, had not considered the possibility that the skin findings were related to the injections.



Figure 1 and 2. Woody induration of buttocks extending to mid-calf

On physical examination, her bilateral lower extremities showed woody induration from mid-calf to buttocks, with increasing induration and nodular texture more proximally. The left was slightly more affected than the right. No overlying skin changes were present on the legs. There was a 15 cm hyperpigmented macule overlying the nodular induration on the left buttock. During performance of a 4 mm punch biopsy, a surprising lack of subcutaneous fat was noted clinically. An elliptical excisional biopsy, which was performed at a later visit, produced minimal adipose tissue despite the depth of incision.

Laboratory tests showed an initial ANA titer from the rheumatology clinic as <1:40 (negative). ANA retesting three months later in the infectious disease clinic showed a titer of 1:320, but it again was reported as < 1:40 three months later in a specimen obtained in the dermatology clinic. All other rheumatologic markers, including Scl70, Ro, La, and histone Ab, were negative. Cat scratch disease, Lyme titer, and RPR serologies were unreactive. The MRI report was read as "a diffuse infiltrative process throughout bilateral lower extremities suggesting connective tissue vs. infectious process". Histopathology showed unremarkable epidermis and dermis with a small fragment of subcutaneous fat demonstrating cystic change.

## Discussion

The patient was given a diagnosis of filler migration, most likely of large volume, non-medical grade silicone. Although the substance injected into the current patient is not definitively known, silicone has been a common substance used for cosmetic augmentation and pathology findings are consistent with the diagnosis. Parafinoma may also produce the pathologic changes seen but is less commonly used and less commonly reported to migrate. Differentiating between these conditions would require another biopsy of tissue for oil red O stain, but because prognosis and treatment are the same, re-biopsy was deferred.

Silicone is the term for a family of man-made polymers containing elemental silicone. The FDA classified silicone as a "new drug" and began regulation of it in 1964, although the liquid form (polydimethyl siloxane) had been used for many years prior to that for soft tissue augmentation. Early experience showed that large volumes led to migration and impurities were sometimes introduced in an attempt to prevent migration by causing fibrosis [2]. This solution, however, instead resulted in reports of sclerosis and ulceration. A series of different silicone based products have been approved by the FDA for investigational studies of injection for soft tissue augmentation, starting in 1965 with DC MDX 4-4011, a sterilized, more highly purified silicone oil, to as recently as 2001 with SilSkin. Despite the availability of higher purity silicone, case reports of injection reactions, nodules, granulomas, and migration continue [3, 4].

Controversy remains over the side effects of silicone, as most evidence comes from case reports and case series. Data from prospective studies controlling for product purity, volume, location of injection, and injection technique, is lacking [5].

Case reports of silicone migration have been reported in facial injections with diffusion affecting other facial areas [4, 6]. Migration to more distant body parts have been reported but are generally limited to cases involving the larger volumes of silicone from, for example, ruptured breast implants [7,8]. Given the extent of the involvement in this patient it is likely that very large volumes were used. Examples of documented case reports of adverse effects of silicone injection and the treatments undertaken are included in Table 1. None of these cases however, present patients with such severe symptoms and such an extensive migration area owing to silicone injection.

The single positive ANA found in this patient is curious but likely unrelated to the current process. Although connective tissue diseases such as scleroderma and systemic lupus have been reported following silicone implantation, well controlled epidemiological studies have not supported the association [8]. Recently, Shoenfeld et al. proposed a new syndrome named Autoimmune/inflammatory Syndrome Induced by Adjuvants (ASIA) encompassing several conditions related to siliconosis. However, the lack of other manifestations of autoimmune disease in our patient does not match the patient data presented by Shoenfeld et al or other models of ASIA [1].

Unfortunately, treatment options in this patient are limited. Although excision is curative, the extent and migration of the substance makes it impractical. Similarly, intralesional triamcinolone injections, although they may soften the individual nodules in the buttocks, are not practical for the diffuse induration affecting the entire legs. The use of topical imiquimod has been reported with some success [9]. However, again owing to the extent of the involvement a more systemic anti-inflammatory approach was sought. Both isotretinoin and doxycycline have been reported to have variable success in the treatment of silicone granulomas [9, 10]. The patient was thus started on a trial of doxycycline 100 mg PO BID. Studies published after the patient received treatment suggest tacrolimus may be beneficial in the treatment of chronic and refractory late-onset immune-mediated adverse effects secondary to silicone injections [11]. However, the small sample size of the study necessitates further validation of the results [12].

**Table 1.**

<b>Injection description</b>	<b>Site of injection, reason</b>	<b>Elapsed time</b>	<b>Reported adverse reaction (number of patients)</b>	<b>Treatment</b>
Liquid silicone [13]	Chin, cosmetic augmentation	40 years	Silicone granuloma over chin, lips, bilateral cheeks, and forehead without mass lesion (1)	Intravenous methylprednisolone and oral prednisone
Liquid silicone (likely containing collagen) [14]	Nose, cosmetic augmentation	18 months	Silicone granuloma causing facial swelling and erythematous nodules most pronounced around left eye and upper lip (1)	Minocyclin
Unknown silicone product [15]	Lips, cosmetic augmentation	2-3 years	Firm nodular swellings over upper and lower lips (1)	PDL laser and topical pimecrolimus, intralesional steroids
Liquid silicone, 30 - 500 mL [16]	Buttocks, augmentation	24 hours – 15 days	Acute pneumonitis (5)	Oral prednisone
Industrial silicone paste [17]	Penis, augmentation	4-15 months	Penile edema, multiple depigmented skin lesions (1)	2 stage excision of involved penile skin with scrotal flap formation
Silicone ring [17]	Penis, augmentation	4 – 15 months	Multiple sinuses of penile skin (1), Abscess discharging pus (1)	Skin incision, drainage of infected material, extraction of implant
PTQ (polydimethylsiloxane particles suspended in bioexcretable carrier hydrogel of polyvinylpyrrolidone) [18]	External anal sphincter, incontinence	<1 – 2 years	Perineal abscesses, defects in IAS and EAS, cyst like tumors, giant cell foreign body granuloma (2)	Resection

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