

Case Report

Silicone Migration and Silicone-Induced Granulomas following Injection in the Buttocks of an HIV Patient: a Case Report and Review of Management

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- Foreign Body Granuloma
- Liposarcoma
- Hiv

Abstract

Background: The use of liquid injectable silicone for soft tissue augmentation is a controversial practice because this material has been implicated in a variety of adverse reactions, sometimes with latent periods of decades, when the patient does not remember which product was injected. The histopathologic findings may allow the identification of the injected filler and is considered the gold standard for diagnosis.

Method: We report the case of a 43-year-old homosexual men with medical history of HIV (CD4 >900 U/ml, viral load < 40cp/ml, on HAART) and hepatitis C who presented with a painful lumbosacral mass 7 years after a soft-tissue augmentation of the buttocks with an unknown product. The medical treatment was insufficient until the patient assessment. It was unclear what the mass represented, and he underwent surgical excision under general anaesthesia, with the histopathologic examination of the biopsy specimen. After surgery the patient presented no complications and was discharged on POD 1.

Results: Histopathologic evaluation revealed the liquid injectable silicone migration accompanied by a granulomatous response and presence of cells with collection of lipid-containing cytoplasmic vacuoles resembling lipoblasts. This pattern can be clinically and histologically confusing for a liposarcoma, especially when this occurrence appears years after injection.

Conclusions: Migration and granulomatous reaction to silicone may occur as much as 10-20 years after injection and the patient often does not initially divulge a history of silicone augmentation, making diagnosis difficult. Complete surgical excision of the mass and histopathologic evaluation resulted in complete resolution and identification of the responsible filler. Abundant empty vacuoles that distort the nuclear contours in the cells that imbibed silicon may be a confounding factor with adipose neoplasms, such a liposarcoma and this diagnosis must be ruled out.

INTRODUCTION

The use of liquid injectable silicone for soft tissue augmentation is a controversial practice within the medical world because it has been implicated in a variety of adverse reactions, sometimes with latent periods of decades (granulomatous nodules, ulceration, cellulitis, migration to distant sites, cystic lesions, disfiguring scarring, discoloration and serious systemic complications) [1-3]. While initial studies demonstrated that injectable silicone is biologically inert, many subsequent reports have shown silicone to induce a granulomatous inflammatory response [4-

9]. Currently, silicone oils are approved by the US Food and Drug Administration (FDA) for soft tissue augmentation. Use of liquid injectable silicone for this purpose has been practiced for the past five decades [10]. Complications can be avoided, following three main rules [10]: 1) using only pure medical grade silicone manufactured for injection into the human body (the industrial-grade silicone contaminated by additives may remain dormant for years and eventually cause formation of extensive granulomas and disfiguring nodules),

2) Using a serial micro droplet puncture technique for

administration as described by Orentreich [11] at 2 to 4mm intervals into the deep dermal or sub dermal plane, allowing the formation of a collagenous capsule around the implanted material, thus holding the silicone at the site of injection and prevents migration

3) Injecting limited volumes (0,01ml to 0,03 ml) at 4 to 6 weeks intervals between treatments [12] that allows time for the collagenous capsule to surround the injected material.

METHODS

We report the case of a 43 year old men with history AIDS (CD4 >900 UI/ml, viral load < 40cp/ml, on HAART) and hepatitis C who presented with a 4 year history of painful lumbosacral mass. The patient reported 4 inflammatory episodes in the past year, with oedema and erythema of the whole lumbosacral region. In the past, the mass was currently asymptomatic. The medical treatment with corticosteroids and antibiotics was insufficient until current patient assessment. Physical examination revealed a 10-15 cm tender mass in the lumbosacral region, with the palpation of three firm, subcutaneous, painful nodules (10 mm diameter) without overlying patches of erythema.

On questioning, he admitted having undergone soft tissue augmentation of the buttocks with an unknown "clear liquid" 7 years prior to our examination.

Complete blood count was normal. MRI demonstrated diffuse heterogeneity and increased uptake in the lumbosacral region at the level of the subcutaneous tissue above the profound fascial layer, similar to a inflammatory reaction. In the cranial and distal part of this region three fluid collections of about 10 mm maximum diameter were present.

Inflammatory nodules are rather common with injection of permanent fillers such as silicone and may appear days to years after treatment appropriate and prompt diagnosis is important in avoiding delay of treatment or long-term complications for the patient [13]. A delayed appearance of non-fluctuant nodular lesions that can have a presentation alarming for a soft tissue neoplasm is a particular feature of unpurified injected silicone [14,15]. With a long latency and delayed presentation surgical excision and histologic examination of the subcutaneous masses are necessary to rule out neoplastic and infectious aetiologies.

RESULTS

Surgical excision was performed under general anesthesia. The patient was treated with intravenous cefazoline 1g twice daily for 5 days and was discharged on post operative day 5 with no complications.

The histopathologic examination of the biopsy specimen revealed from a macroscopic point of view a disruption of the fat architecture between the superficial and the deep fascia and the presence of multiple variably sized cystic cavities, ranging 1µm to 10mm, filled with translucent material (Figure 1). From a microscopic point of view the silicone material was visible within the subcutaneous tissue as rounded vacuoles or droplets lined by atrophic epithelium or as large cytoplasmic inclusions within macrophages, histiocytes and foreign body giant cells (Figure 2). Some of the hyper chromatic nuclei showed signet ring appearance

and indentations creating the appearance of pseudolipoblasts [Figure 3]. Selected immunohistochemical studies were performed: S-100 stain was negative (Figure 4). Extensive infiltrate of CD 68-positive histiocytes was present, consistent with a foreign body granulomatous reaction. Multinucleated giant cells were present surrounding the deposited material. Scattered lymphocytes were present perivascularly and in the stroma. There was no evidence of scar formation or hemosiderin deposit which suggested that the silicone present was not the result of a primary injection but rather the product of migration from elsewhere. A diagnosis of silicone granuloma was made. The silicone causing this foreign-body response was the result of migration from the primary injection site (buttocks).

DISCUSSION

The severity and timing of reactions after injection of liquid silicone are variable. Rare but serious complications including silicone migration and painful granulomatous reactions may occur years to decades after injection [9,16]. The first occurrence of silicone granuloma was reported by Winer *et al.* in 1964 [16]. Since that time, numerous cases have been described with different local presentation: localized swelling, erythema, subcutaneous nodules, generalized cutaneous induration and ulceration.



Figure 1 Macroscopic view. Disruption of the fat architecture between the superficial and the deep fascia and the presence of multiple variably sized cystic cavities, ranging 1µm to 10mm, filled with translucent material.

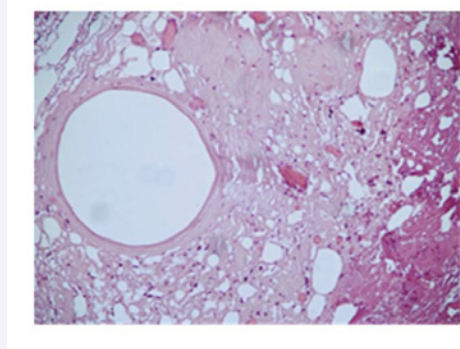


Figure 2 Hematoxylin & Eosin stain. Vacuoles, diffuse histiocytic infiltrate and multinucleated giant cells surrounding the deposited material (minimal granulomatous inflammation is present).

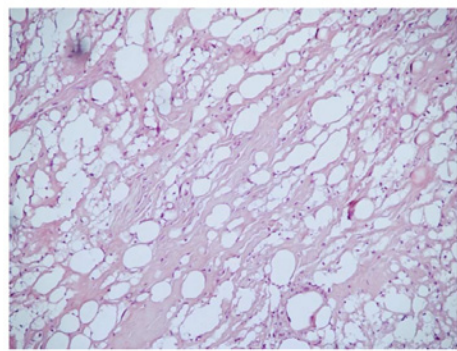


Figure 3 Vacuoles are phagocytosed by histiocytes, while others are present freely in the stroma. Nuclei shows signet ring appearance and indentation creating the appearance of pseudolipoblasts.

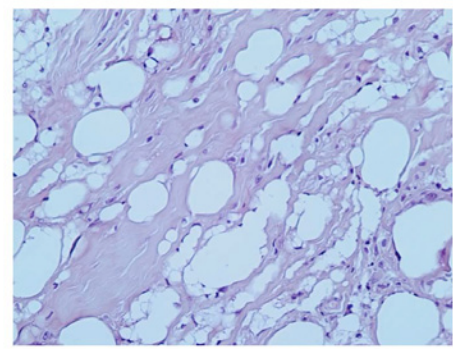


Figure 4 Immunohistochemical stain for S-100 showed no positive staining.

These findings may develop at sites distant to the original site of injection because of silicone migration along tissue planes (like superficial and profound fascia). If the silicone gains access to lymphatics, systemic signs such as fever, nausea, vomiting and weight loss may be present. The clinical presentation may mimic that of an infectious, malignant or other granulomatous process and a history of silicone injections is often unknown to the clinician [1,5,17]. Complications are much more likely to arise with the use of impure silicone and with large-volume injections. When this is performed by an experienced physician, with proper technique, at the proper depth (deep dermal or subdermal plane), avoiding overcorrection and with adequate time between injection series (4 to 6 weeks), the injected area has the same texture as that of the adjacent tissue. A delayed appearance of non-fluctuant nodular lesions that can have a presentation alarming for a soft tissue neoplasm is a particular feature of unpurified injected silicone [14,15]. With a long latency, histologic examination of surgical specimens is warranted to rule out neoplastic and infectious aetiologies. The histologic patterns that have been described in silicon-related nodules include large and midsized, round to oval cystic spaces often lined by foreign body-type giant cells [21]. Abundant vacuoles that may displace or distort the nuclear contours in the cells that imbibed silicone may be a confounding factor with adipose neoplasms, such as liposarcoma [1]. The treatment of silicone granulomas can be

challenging, and a number of modalities have been implemented with varying degrees of success. When the granuloma is a well circumscribed, isolated nodular lesion, surgical excision may be an effective option. In cases involving widespread or poorly described lesions, complete surgical excision may be difficult and the risk of poor surgical outcome and complications is higher. For severe or refractory cases the antibiotics, intralesional or systemic corticosteroids and other immune modulating drugs have been used [5,17].

CONCLUSION

Migration and granulomatous reaction to silicone may occur as much as 10-20 years after injection and the patient often does not initially divulge a history of silicone injection, making diagnosis difficult. Complete surgical excision of the mass and histopathologic examination has been an effective option in this case, resulted in complete resolution and identification of the responsible filler. We present a case of silicone-induced subcutaneous tissue mass that clinically and radiologically had features that may had been mistaken for a neoplastic process such as liposarcoma. It is important to consider that the immune reconstitution achieved with highly active anti-retroviral therapy (HAART) may place patients treated with silicone at increased risk of granulomatous foreign body response [10]. Jones *et al.* reported their pilot study of 77 patients treated for HIV-induced lipotrophy with liquid injectable silicone and conclude that is an excellent and safe treatment when appropriately employed (Orentreich technique) [19]. The use of silicone for enhancing facial features or secondary sexual characteristics is common among some groups in the USA including exotic entertainers and transgendered and transsexual individuals [3]. Serious complications occur in a fraction of 1% of cases when proper technique and material are employed, according to Duffy *et al.* [12]. Silicone requires extensive experience and precise technique in order to achieve optimal results while avoiding potential serious complications.

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