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CASE REPORT
Cosmestic

Resolution of Cosmetic Buttock Injection-induced Inflammatory Reaction and Heart Failure after Excision of Filler Material

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We present a case of a 66-year-old woman who developed heart failure and severe inflammatory reaction after the illicit cosmetic injections of polymethyl-methacrylate or polyacrylamide hydrogel from a primary care provider. After medical optimization, an en bloc excision of all injectable materials and gluteus muscle was performed, which resulted in exposure of bilateral sciatic nerves. Within 10 days, the patient's heart failure resolved and inflammatory state improved. This is the first known report of heart failure due to buttock injections and subsequent improvement after surgery. *(Plast Reconstr Surg Glob Open 2016;4:e1079; doi: 10.1097/GOX.0000000000001079; Published online 4 October 2016.)*

The number of cosmetic soft-tissue augmentation procedures has increased dramatically in the past 2 decades.[1] Concomitantly, a multitude of filler materials have been developed with a wide range of properties.[2] However, the use of fillers is not without risk. Numerous reports have documented adverse outcomes including allergic reaction, granulomatous inflammation, and pulmonary embolization.[3] Here, we present an unusual complication of illicit injectable buttock augmentation that resulted in chronic inflammation and congestive heart failure, which resolved promptly after surgical excision of the foreign material.

CASE REPORT

A 66-year-old woman with a past history of hypertension, chronic kidney disease, and normal exercise tolerance presented 1 year after having large-volume (400 cm^3) cosmetic buttock injections by her primary care provider. It is unclear exactly which product was utilized because the physician's notes listed both polyacrylamide hydrogel and Polymethyl-methacrylate (PMMA). Within several weeks, she developed injection-site inflammation, resulting in hardening, significant pain, and a requirement for prednisone 60 mg daily for symptom control. Further sequelae included steroid-related diabetes mellitus, chronic tachycardia, anemia requiring regular transfusions, and systolic heart failure. An echocardiogram measured her ejection fraction (EF) at 31%, and this was attributed to chronic inflammation. Angiography did not reveal coronary arterial disease. Over several months, the filler had hardened into tender, indurated masses (Fig. 1). She had significant pain and difficulty with both ambulation and sitting. She was offered a wide excision of the foreign material as a means to decrease her systemic inflammatory response and potentially reverse her newly diagnosed heart failure.

After 3 months of medical evaluation and optimization, the patient underwent surgical excision of the large inflamed masses. Bilateral 20 cm × 10 cm ellipses of involved skin, subcutaneous fat, and gluteus maximus muscles containing the injected material were excised en bloc. The gluteus muscle appeared nonviable and did not contract when stimulated with electrocautery. Much like a gluteal flap elevation, the space between the gluteus maximus and medius was developed, and the sciatic nerve identified (Figs. 2, 3). The injection material tracked inferiorly along the epineurium of the sciatic nerves, requiring careful dissection and neurolysis. The patient was transfused 3 units of packed red blood cells during the procedure. Because of normal laxity superior and inferior to the excised specimens, a primary closure over closed suction drains was achieved. Pathology specimens from surgery showed fat necrosis, hyalinization of

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Fig. 1. Hyperpigmented, indurated lesions in bilateral buttocks 1 year after soft-tissue filler injections for buttock augmentation.

Fig. 2. Gross specimen of skin, subcutaneous fat, and gluteus maximus muscle and injected material measuring 20 cm × 10 cm excised en bloc.

soft tissues, dystrophic calcification, and foreign body giant cell reaction (Fig. 4).

The patient was maintained as an inpatient for 11 days postoperatively on an air-fluidized bed with a sitting protocol begun on postoperative day (POD) 4. Her pain diminished significantly after surgery and tachycardia resolved almost immediately. She began to walk with assistance on POD 7. Echocardiogram on POD 10 showed a complete resolution of heart failure with an EF of 56%. Leukocyte count decreased from 20,000 to 7,800 cells per microliter and corticosteroids were tapered. Her postoperative course was complicated by a mild wound infection, seroma, and grade 2 sacral pressure sore. Repeat echocardiogram on POD 72 revealed a maintained EF of 64%.

DISCUSSION

The burden of harm from injectable fillers offered by untrained or unlicensed providers is likely significantly

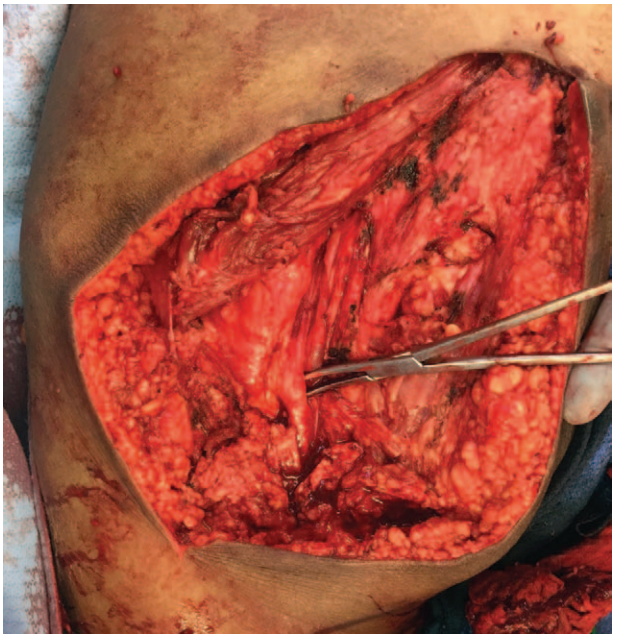

Fig. 3. Dissection of left buttock after removal of inflamed tissue with resultant exposure of the sciatic nerve (highlighted by the hemostat), which required careful dissection and neurolysis.

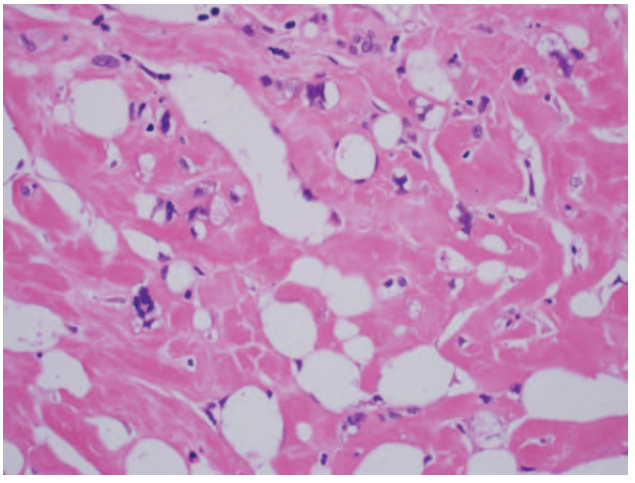

Fig. 4. Microscopic section with predominantly vacuolated morphology consistent with foreign material, giant cell reaction, fat necrosis, and foci of calcifications.

underreported.[4] In this case report, a patient developed an exuberant inflammatory reaction after large-volume buttock injections from a primary care provider. Although both polyacrylamide gel and PMMA in various forms have been approved for over 20 years as dermal fillers, neither of these products is FDA approved for buttock injections in the United States. Data regarding large-volume injection of fillers for buttock augmentation are essentially unavailable for this off-label use.

Large studies of polyacrylamide and PMMA for facial rejuvenation have demonstrated positive esthetic results with minor complications ranging from 2.2% to 15.9%.[5, 6] However, both materials have been associated

with significant inflammatory reactions. Christensen et al[7] reported a volume-dependent inflammatory reaction to polyacrylamide injection for breast augmentation; histological analysis showed that large volumes were associated with foreign-body giant cell reaction. Manafi et al[8] described 98 consecutive patients presenting with complications from polyacrylamide injection, most commonly inflammation, including 9 from buttock or leg injections. In their series, all patients were treated with an incision, drainage, and irrigation; none required a radical excision. Salles et al[9] reported 32 patients with complications after cosmetic injection of PMMA in Brazil. Ten of these patients also presented with chronic inflammatory reactions, all after facial injections, whereas 2 presented with pain and nodularity secondary to gluteal augmentation.

In the case of an inflamed foreign material injection such as this, a staged excision with dressing changes or vacuum-assisted closure could be considered to minimize complications associated with immediate closure. However, in the above patient, this was avoided due to concerns of exposure of sciatic nerves and risk of a second anesthetic, given her cardiac status.

This report represents the first case, to our knowledge, of heart failure associated with a severe inflammatory reaction to a soft-tissue filler injection, successfully reversed with surgical excision. Congestive heart failure has traditionally been viewed as a hemodynamic disorder, yet systemic inflammation has been implicated in its pathogenesis.[10] An elevated level of the proinflammatory cytokine tissue necrosis factor α (TNF-α) is one of the principal derangements seen in the setting of heart failure.[11] TNF-α suppresses cardiomyocyte contractility and promotes left ventricular dysfunction[12]; the TNF-α inhibitor etanercept demonstrated significant improvements in left ventricular EF in human clinical trials.[13] TNF-α also has a critical role in the pathogenesis of granulomatous inflammation of the kind presented here.[14] Although the mechanisms by which our patient's congestive heart failure resolved after excision remains unclear, an appealing hypothesis entails the removal of a generator of proinflammatory cytokines that were exerting a deleterious effect on myocardial function.

CONCLUSIONS

We present a patient with a severe inflammatory reaction and heart failure after illicit injection of a large volume of filler for buttock augmentation. After wide excision of the filler material, the inflammatory reaction and heart failure resolved. This type of excision has a high risk of morbidity but can result in the resolution of filler-related complications. Large-volume buttock filler injections have significant potential for patient harm.

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