Introduction

Penile augmentation procedures with liquid injectable silicone (LIS) are not uncommon in areas of Southeast Asia, such as Thailand, Indonesia, and the Philippines. Outcomes from procedures often vary, but reported complications from such enhancement procedures may be devastating, including: extensive scarring and ulceration, foreign body reactions such as granuloma or necrosis, significant pain, and erectile dysfunction. Reconstruction of penile shaft skin defects traditionally include split thickness skin grafting, but this approach may often be complicated for patients with migrating LIS to the scrotum. Here, we present an unusual case of penile liquid silicone injection presenting 30- years after augmentation in a 56-year-old Asian male with mechanical erectile dysfunction. We illustrate our approach to reconstruction of penile shaft defects in the setting of migrating LIS to the scrotum using a lateral scrotal flap.

Case presentation

This is a 56-year-old Asian male with a history of liquid silicone injection to the penis 30 years prior to presentation and subsequent development of pain with erections and inability to achieve complete erections. On physical examination, there was evidence of circumferentially thickened and chronically inflamed penile shaft skin extending from the penoscutal junction to about 1.5 cm proximal to the glans corona. The injected foreign material had also migrated to involve the right upper scrotum and dorsum of the penis near the pubis forming ‘siliconomas,’ prominent mass-like areas of induration and fibrosis. The penile meatus was otherwise normal. Both testicles were descended and spermatic cord structures appeared normal on palpation. Given the grossly thickened and extensive shaft defects essentially involving the entire length of the penis, the penile skin did not appear to be salvageable. We planned for a dual-disciplinary approach, which involved excision of the entire penile shaft skin and subcutaneous tissue by the Urology team followed by penile reconstruction with lateral scrotal flaps per Plastic Surgery.

Intra-operatively, we incised circumferentially 1-cm proximal to the coronal margin and deglove the penile skin (Fig. 1a). The foreign material appeared to be mostly limited to the dermal skin layer but was slightly adherent to the neurovascular bundle along the proximal shaft. We were able to successfully dissect this with preservation of the neurovascular bundle (Fig. 1b). There was no violation of the corpora spongiosum. We carried our dissection down to the level of the pubic bone proximally. At the level of the scrotum, the migrated foreign material appeared to infiltrate into the deep dartos layer. A 2 x 2-cm area of residual foreign material was left in place anterior to the right distal spermatic cord due to its intimate proximity to the cord. All fibrotic tissue affected by the silicone injection had been removed safely.

Plastic Surgery introduced a 5-cm scrotal skin incision along the median raphe. The apex of the incision was sutured to the base of the shaft of the penis. This allowed for creation of lateral scrotal skin flaps, which covered the entire shaft of the penis and testicles (Fig. 2a).

The base of the shaft was sutured with interrupted 3-0 monofilament sutures (Fig. 2b).

Next, interrupted 3-0 gut suture was used to secure the skin edges to themselves and the corona of the penis. Excellent skin closure was
visualized. A 10Fr Blake drain was left in place. Post-operatively (Fig. 3a–b), the patient noted marked improvement in his pain level with erections and was satisfied with the quality of his erections.

**Discussion**

Adverse outcomes of penile girth augmentation using LIS have been reported in the literature. In this case, the patient presented approximately 30 years following liquid silicone injection with complaints of pain with erections and an inability to achieve full erections. The delayed presentation of adverse reactions is not uncommon and can occur months to years following injection. While a majority of complications occur 5–25 years post-injection, the longest reported complication was reported 36 years post-injection.²

Surgical management of these reported cases commonly include excision of penile defects and reconstruction with split thickness skin grafting, which was illustrated in a recent case series of five patients.³ Penile shaft skin resurfacing with split thickness skin grafting using a donor thigh site appeared to have improved cosmetic and functional outcomes. However, the defects in such cases were typically limited

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**Fig. 1.** (A) Circular excision of the entire penile shaft skin (B) with preservation of the neurovascular bundle.

**Fig. 2.** (A) Broad-based lateral scrotal flap covering penile shaft and testicles (B) with closure using 3-0 Biosyn suture.
exclusively to the penile shaft. In cases with concurrent migrating silicone involving the scrotum, a split thickness skin graft may not be feasible. Silicone migration has been reported to involve other parts of the body in patients with localized LIS, such as the breast, face, liver, and spleen. This phenomenon has been largely attributable to cases of large-volume, low-viscosity injections, which ultimately prevent encapsulation of the material.

This case report illustrates an alternative reconstructive option using a lateral scrotal flap for cases of extensive penile scarring with simultaneous migrating silicone to the scrotum. Indeed, the use of bilateral scrotal skin flaps have been demonstrated to be feasible as an alternative to the traditional approach of resurfacing the penile shaft in cases of penile paraffinomas, as described by Cecil. In our case, given that the migration of silicone has only involved the right upper scrotum, we opted to leave the left-side intact and without disruption of the blood supply. This approach was preferred, as the right-sided scrotal skin appeared salvageable after our dissection. We believe our one-sided lateral scrotal flap approach may be beneficial in cases of unilateral silicone migration. Additionally, Fakin et al. recently demonstrated the use of bipedicled anterior scrotal flaps for reconstruction of penile shaft defects following silicone injection in a study of 43 men. This surgical technique provided good functional and aesthetic outcomes, high patient satisfaction, and was associated with only minor complications such as partial necrosis and hematoma. The use of a scrotal flap is a valuable technique in such cases requiring complex reconstruction and provides favorable functional and cosmetic outcomes.

Conclusion

Penile augmentation procedures with LIS are often associated with significant post-procedure complications such as mechanical erectile dysfunction. Complex penile skin reconstruction in cases of silicone migration to the scrotum may benefit from inclusion of lateral scrotal skin flaps for additional skin resurfacing. Our experience demonstrates improved erectile function and adequate cosmetic outcome using this technique.

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.eucr.2018.07.006.

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