

Penile Paraffinoma: Dramatic Recurrence After Surgical Resection

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PRACTICE POINTS

- Taking a thorough history in patients with possible paraffinomas is vital, including a history of injectables even in the genital region.
- Biopsies in cosmetically sensitive areas must be given careful consideration. Clinical history must support the decision to pursue a definitive diagnosis.
- Early detection is critical in the management of paraffinomas, especially in anatomic locations where tissue preservation is of utmost importance.

To the Editor:

The term *paraffinoma* refers to a chronic granulomatous response to injection of paraffin, silicone, or other mineral oils into skin and soft tissue. Paraffinomas develop when the material is injected into the skin for cosmetic purposes to augment or enhance one's appearance. Although they may occur in any location, the most common sites include the breasts and buttocks. The penis is a rare but emerging site for paraffinomas.¹⁻³ We present a rare case of recurrence of a penile paraffinoma following surgical resection.

A 26-year-old uncircumcised Trinidadian man presented with a 5-cm, exquisitely tender tumor involving the penile shaft and median raphe that rapidly evolved over the course of 3 weeks (Figure 1). He presented with inability to urinate, attain an erection, or ambulate without notable tenderness. Additionally, he developed swelling of the penis and surrounding tissue. He had no other medical comorbidities; however, 1 year prior he presented to a urologist with a 1-cm nodule involving the median raphe that was surgically resected and required circumcision. Biopsy at the time of his surgical procedure

revealed an exuberant foreign body giant cell reaction with surrounding empty spaces in the dermis resembling Swiss cheese, consistent with a paraffinoma (Figure 2). The recurrent tumor, which was 5 times the size of the initial nodule, was biopsied. Again, histopathologic findings were consistent with a paraffinoma with extensive dermal fibrosis and absence of polarizable material.

The patient underwent extensive reconstructive surgery requiring skin grafting to the penile shaft. Given the size and location of this recurrent tumor with the ability to destroy vital urologic and reproductive function, consideration for prevention of recurrent episodes included novel therapeutic treatment options

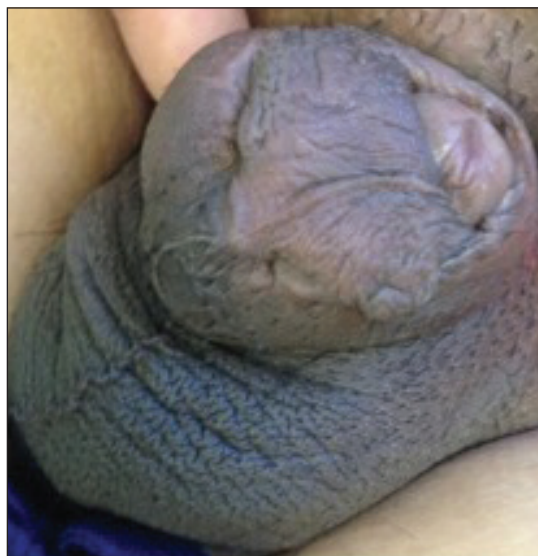


FIGURE 1. Hyperpigmented firm, mobile, 5-cm tumor involving the penile shaft, frenulum, and scrotum caused by paraffin injections.

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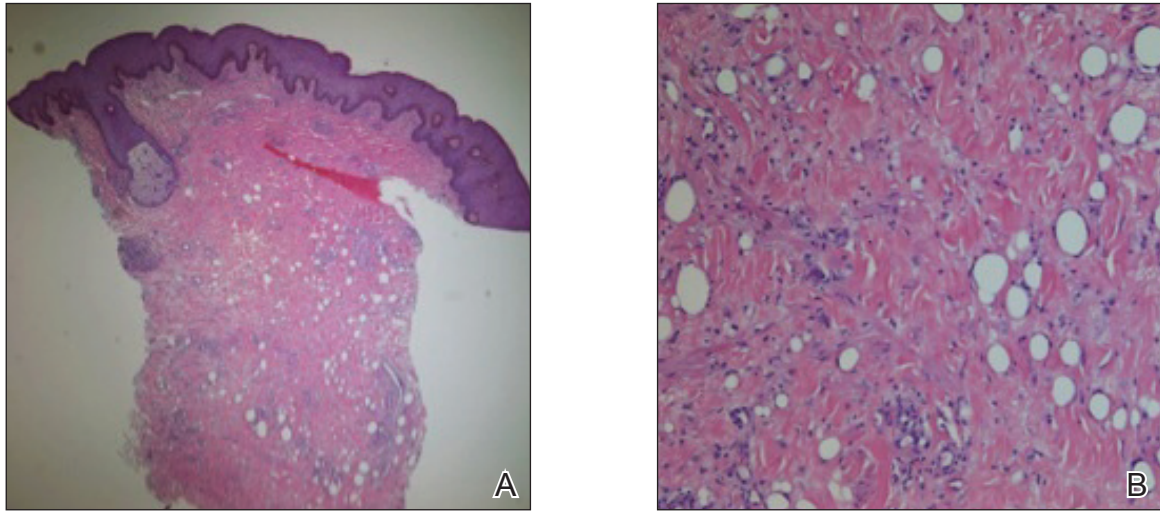


FIGURE 2. A, Histopathology revealed a square-shaped biopsy with extensive dermal fibrosis and scattered empty spaces in the dermis resembling Swiss cheese consistent with paraffinoma (H&E, original magnification $\times 10$). B, High-power magnification revealed a foreign body giant cell reaction with surrounding empty cystlike spaces in the dermis and dermal fibrosis (H&E, original magnification $\times 40$).

to suppress inflammation and fibrosis with doxycycline and nicotinamide.

Paraffin injections are used for cosmetic enhancement and most often occur in a nonclinical setting without medical supervision, as they are not US Food and Drug Administration–approved medical injectable materials. Examples of oils injected include paraffin, camphorated oil, cottonseed or sesame oil, mineral oil, petroleum jelly, and beeswax. These oils are not hydrolyzed by tissue lipases but are instead treated as a foreign body substance with subsequent granuloma formation (also known as sclerosing lipogranuloma), which can occur many years after injection.⁴ The granulomatous response may be observed months to years after injection. The paraffinoma normally affects the injection site; however, regional lymphadenopathy and systemic disease has been reported.² Histopathologic findings are characteristic and consist of a foreign body giant cell reaction, variably sized round to oval cavities within the dermis, and varying degrees of dermal fibrosis.⁵

In 1899, mineral oil was first injected into male genitalia to restore architecture in a patient's testicles following bilateral orchiectomy. After the success of this endeavor, mineral oil injections were used as filler for other defects.³ However, by 1906 the complications of these injections became public knowledge when 2 patients developed subcutaneous nodules after receiving injections for facial wrinkles.² Despite public knowledge of these complications, penile paraffin injections continued to occur both in medical and eventually nonmedical settings.

In 1947, Quérnu and Pérol⁶ described 6 penile paraffinoma cases outside the United States. Patients had petroleum jelly injections that eventuated in penile paraffinomas, and all of them lost the ability to attain an erection.⁶ Four years later, Bradley and Ehr Gott⁷

described a case of penile paraffinoma likely caused by application of paraffin in association with occupational exposure. In 1956, May and Pickering⁸ cited a case of penile paraffinoma affecting the entire penile shaft in which the patient had undergone paraffin injection 7 years prior to treat premature ejaculation. Unfortunately, the injection resulted in a painful and unsatisfactory erection without resolution of premature ejaculation.⁸ Lee et al⁹ analyzed 26 cases of penile paraffinomas that occurred from 1981 to 1993. They found that all patients underwent injections of paraffin or petroleum jelly performed by nonmedical personnel with the predominant goal of enhancing penis size. Within 18.5 months of injection, 19 patients already experienced tenderness at the injection site. The remaining 7 patients experienced penile skin discoloration and abnormal contouring of the penis. Biopsy specimens revealed hyaline necrosis of subcutaneous adipose septa, cystlike spaces throughout involved tissue, and macrophages engulfing adipose tissue were found near blood vessels.⁹ In 2007, Eandi et al⁴ reported a case of penile paraffinoma with a 40-year delay of onset. Four years later, Manny et al¹⁰ reported penile paraffinomas in 3 Laotian men who injected a mineral oil.

Currently, paraffin injections are uncommon but still are being performed in some countries in Eastern Europe and the Far East¹¹; they rarely are reported in the United States. Injections can occur in unusual sites such as the knee, and paraffinomas can develop many years after the procedure.¹² Additionally, paraffinomas can obscure proper diagnosis of carcinomas, as described by Lee et al¹³ in a case in which a cervical paraffin injection confounded the diagnosis of a thyroid tumor. Furthermore, these injections usually are performed by nonmedical personnel and typically are repeated multiple times to reach cosmetic goals, rendering the patient vulnerable to early

complications including allergic reactions, paraphimosis, infection, and inflammation.³

The clinical presentation of a penile paraffinoma may be a mimicker of several different entities, which are important to consider in the evaluation of a presenting patient. Infectious etiologies must be considered including lymphogranuloma venereum, granuloma inguinale, atypical mycobacteria, lupus vulgaris, and sexually transmitted infections. Importantly, neoplasms must be ruled out including squamous cell carcinoma, soft tissue sarcomas, melanoma, adenocarcinoma, or metastasis. Lymphedema, prior surgical procedures, trauma, and inflammatory etiologies also are in the differential diagnosis.¹⁴ Nonetheless, physicians must have a high clinical suspicion in the evaluation of a possible paraffinoma, as patients may not be forthcoming with relevant clinical history regarding a prior injection to the affected site, particularly if the injection occurred many years ago. As such, the patient may not consider this history relevant or may not even remember the event occurred, as was observed in our case. Furthermore, embarrassment, social taboo, and stigma may be associated with the behavior of undergoing injections in nonclinical settings without medical supervision.¹⁵

Patients may be motivated to undergo dangerous procedures to potentially alter their appearance due to perceived enhanced sexual ability, influence by loved ones, cultural rituals, and societal pressure.^{15,16} Furthermore, patients may not be aware of the material being injected or the volume. Given that these injections often are used with the goal of cosmetic enhancement, biopsies in cosmetically sensitive areas must be given careful consideration, and a thorough clinical history must support the decision to pursue a biopsy to obtain a definitive diagnosis.

The definitive diagnosis of a paraffinoma is determined by histopathology. However, the use of imaging modalities such as magnetic resonance imaging and computed tomography have been employed to delineate the extent of involvement. Imaging studies allow for surgical planning and may assist in narrowing a differential diagnosis.¹⁷ Currently, wide and complete surgical resection is the only definitive treatment of paraffinomas, including penile paraffinomas, as there is no evidence of spontaneous regression.³ A report of a reconstructive surgery involving penile resurfacing without T-style anastomosis has been found effective at preventing necrosis of the ventral penile skin. Not all paraffinomas behave similarly, and there is no reliable method to determine which paraffinoma may possess a more aggressive clinical course compared to those which have a more indolent course.¹⁸ As such, early detection is critical in the management of paraffinomas, especially in anatomic locations where tissue preservation is of utmost importance. In the case of a large penile paraffinoma with the ability to destroy vital urologic and reproductive function, physicians must consider prevention of recurrent episodes through suppression of

inflammation and fibrosis with doxycycline and nicotineamide.¹⁹ Other medical treatments reported with varying success include corticosteroids, imiquimod, and isotretinoin.¹⁹⁻²⁴ Employing adjunctive medical treatment may decrease the size of the mass, reducing the surgical defect size and preserving tissue vitality. Ultimately, the most crucial aspect in treatment is prevention, as injection of foreign materials elicits a foreign body response and can lead to notable morbidity.

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