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Localized Myxedema of the Foot Associated With Trauma and Surgery

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ABSTRACT

Localized extratibial myxedema is a rare presentation of thyroid disease that manifests with varied symptoms. Previous surgical or radioiodine treatment of hyperthyroidism is linked to the development of localized myxedema, as is prior trauma or surgery. We present the first known case of localized foot myxedema on a background of Graves disease following a traumatic and surgical precipitant and compare and discuss similar cases found in a literature review.

INTRODUCTION

The presentation of dermopathy in Graves disease is most commonly pretibial, accounting for 99% of presentations.[1] Rare cases of extratibial involvement have been described and labeled as localized myxedema; however, no cases of isolated foot—ie, without simultaneous toe or pretibial—involvement have been documented secondary to both traumatic and surgical precipitants. We present a case of localized myxedema of the dorsal foot, review associated literature, and discuss the implications.

CASE REPORT

A 35-year-old woman presented with a left foot lesion and a 9-year history of Graves disease that previously presented as Graves triad (thyrotoxicosis, pretibial myxedema, and exophthalmos). Her thyrotoxicosis had been successfully treated with [131I] sodium iodine and subsequent thyroxine replacement, after which thyroid function test normalized.

She noticed a left dorsal foot mass 2 years ago that she believed was related to a blunt injury sustained in the prior year. Ultrasound showed a dense cystic mass of unknown origin. Histopathology from an excisional biopsy confirmed myxoma.

A year later, the excisional site became erythematous and thickened and was associated with nonpitting edema as well as keloid formation. This area progressed to a 13 cm × 10 cm region of induration, discoloration, and thickening with a nonspecific central ulceration (Figure 1). There were multiple, small distinct erythematous patches on the thigh and calf area. These patches had a different appearance than the foot lesion and were not characteristic of any specific disease process.

A fine needle aspirate was indeterminate with an unusual appearance suggestive of a mixed tumor/sarcoma; magnetic resonance imaging showed marked fibrotic tissue proliferation of nonspecific origin. Based on these findings, we performed an elective wide local excision down to the paratenon and took multiple biopsy specimens, including the foot (at the deep margin), thigh, and pretibial area. We delayed closure to ensure deep margin clearance (Figure 2); it was achieved with INTEGRA (Intregra LifeSciences Corporation, Plainsboro, NJ) wound dressing (Figure 3) followed by delayed split skin grafting. Histopathology was consistent with localized myxedema without any evidence of neoplasia at the biopsy sites (foot, thigh, and calf).

Postoperative recovery was uneventful; her hospital stay lasted 17 days after the excision and 10 days after the reconstruction. Her wounds healed within 2 months, with only a small area of hypergranulating tissue at the lateral aspect of the split skin graft (Figure 4). The thigh and pretibial lesions settled spontaneously within 4 weeks.

RESULTS

We found few published cases regarding localized (extratibial) myxedema. The table presents an overview of all relevant cases identified, with our case

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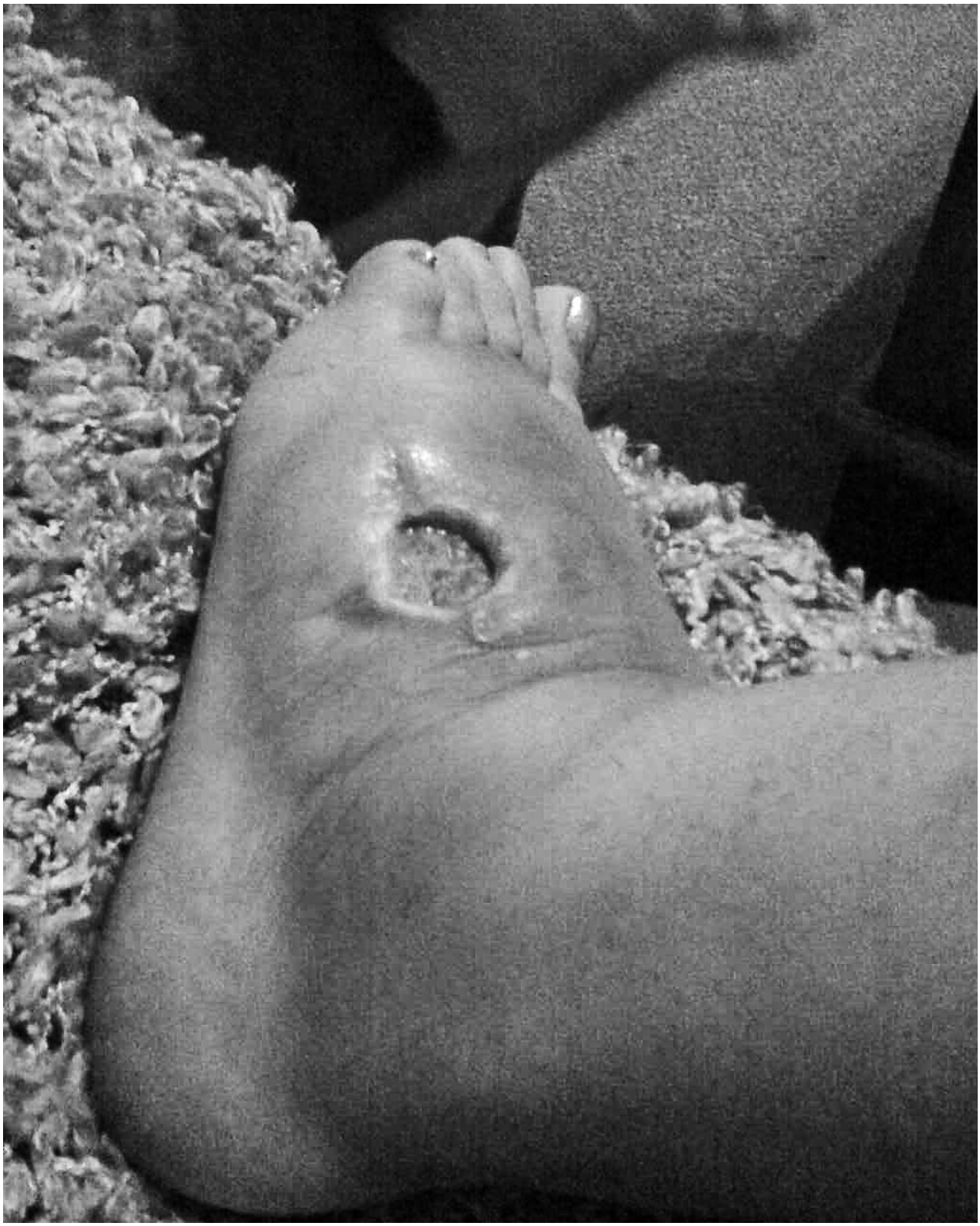

Figure 1. Localized myxedema of the foot with central nonspecific ulceration.

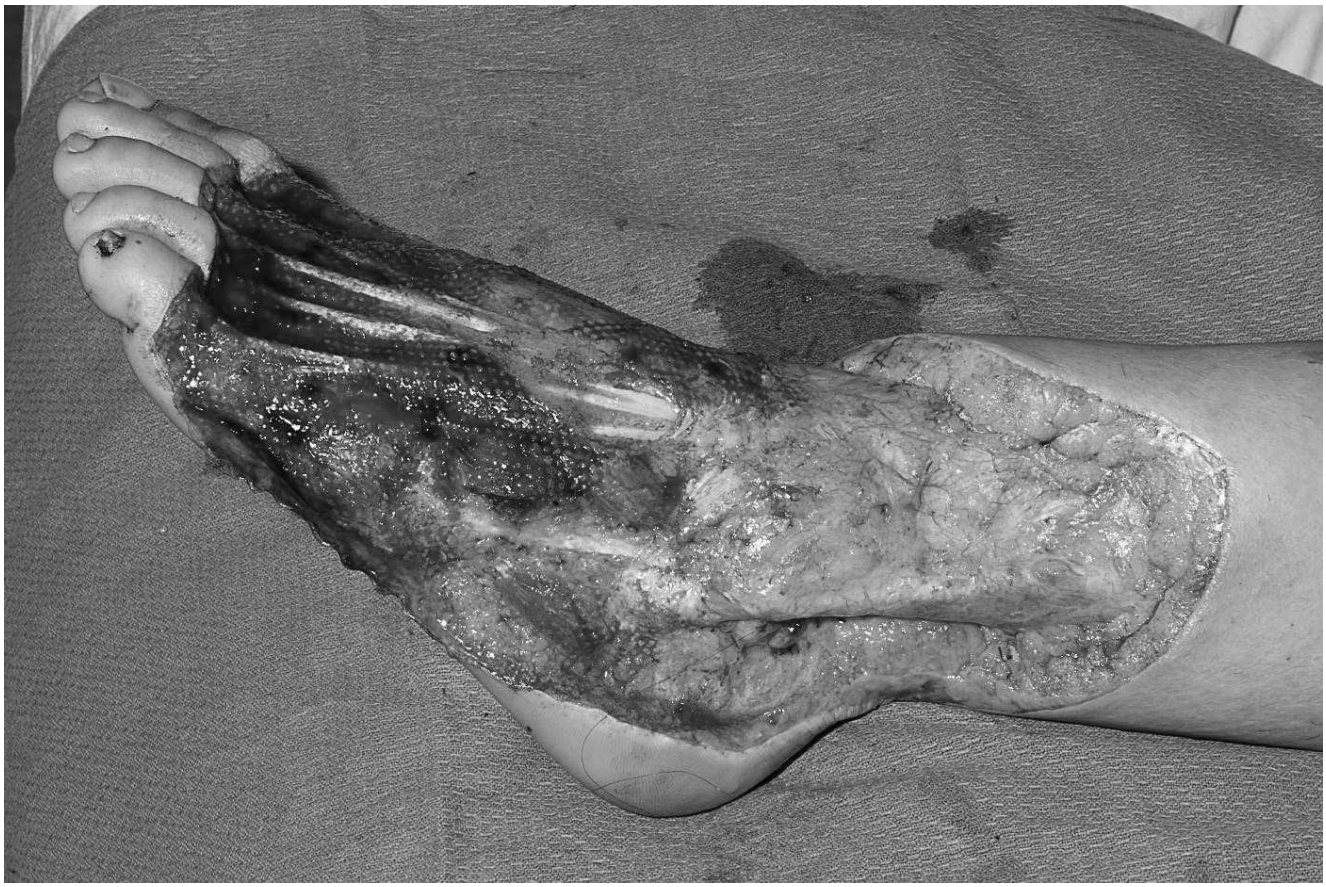

Figure 2. Postexcision foot.

listed last.[2-14] We have 16 cases; the age range was 25 to 74 years (mean 50.56 years), involving 8 females and 8 males. Multiple sites were involved.[3] We excluded 2 studies from this review because they were not in English.[13,14]

In these 16 instances of isolated myxedema, 12 presented initially with hyperparathyroidism, 2 had hypothyroidism, 1 was euthyroid, and the thyroid status of 1 was unknown. Within the hyperthyroid subgroup, 7 of 12 cases and 3 of 12 cases had been previously treated with radioiodine and surgery, respectively. Of the 2 remaining cases, 1 was treated medically with propylthiouracil and the other with methimazole. The time delay from treatment of hyperthyroidism to presentation with localized myxedema varied from 1 month to 16 years (mean 5.13 years).

A traumatic precipitant was noted in 2 cases and a surgical precipitant in 6 cases. Three further cases merit consideration as possibly caused by a traumatic precipitant: Case 1 involved a shoemaker who developed myxedema on the dorsum of his hand from work-related trauma, Case 2 involved bilateral toe myxedema secondary to repetitive small shoe trauma, and Case 3 involved nasal dorsum myxedema because of external stimuli/trauma. Therefore, 8 to 11 of 14 cases are associated with precipitating factors. The time delay to presentation with localized myxedema varied from 1 month to 7 years (mean 2.3 years).

Clinical findings accompanying localized myxedema were varied: Exophthalmos was found in 11 cases, pretibial myxedema in 9 cases, exophthalmos and pretibial myxedema in 8 cases, and Graves triad in 7 cases. More isolated presentations also occurred. In 2 cases, localized myxedema was the presenting sign of Graves disease. In another case, localized myxedema occurred alone on a background of hypothyroidism, and localized myxedema occurred alone on a background of hyperthyroidism in 1 case. Regardless of presentation, biopsy diagnosis was needed for definitive confirmation in 12 of 15 cases (the biopsy status was unknown in 1).[7]

DISCUSSION

Localized myxedema presents in all thyroid states and is commonly considered a manifestation of general autoimmune thyroid disease rather than of a specific thyroid state.[15] Although its occurrence is most commonly associated with hyperthyroidism, its presentation

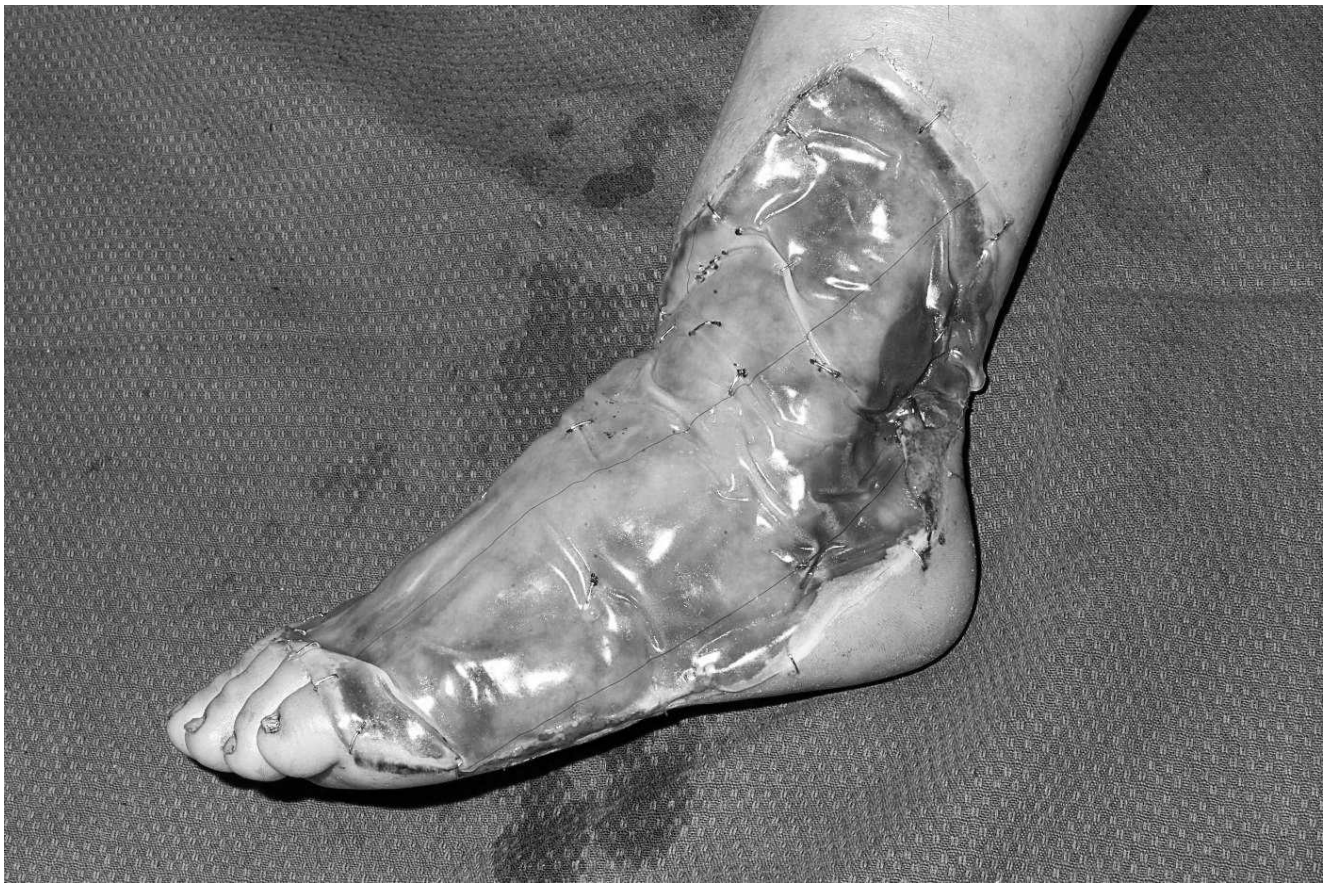

Figure 3. INTEGRA in situ.

in other thyroid states should not be excluded. The above findings are in accordance with well-established knowledge that localized myxedema occurs after surgical or radioiodine therapy for thyrotoxicosis.[2-6,10]

Local factors analyzed included trauma and surgery at the site of localized myxedema, both of which have been reported as contributors or precipitants to the localization of the myxedema process.[2-6,10,16,17] Surgical precipitants were more common than traumatic precipitants; however, surgeries are more easily identifiable events and more easily graded than trauma. It appears that a markedly variable time delay between hyperthyroidism treatment or precipitant exposure and the onset of localized myxedema can occur. However, it is difficult to draw specific conclusions based on the small case numbers.

Given the predisposition of localized myxedema manifestation through trauma and surgery, prevention is ideal. Careful consideration is needed when contemplating surgery in those with thyroid disease, especially those with risk factors for localized myxedema. Trauma prevention is more complicated and probably unattainable.

Our case of localized myxedema of the dorsal foot also presents several interesting points. Both a traumatic and a surgical precipitant could be identified, which has as yet not been described in past papers; nonetheless it is impossible to draw speculation as to whether the 2 precipitants acted cumulatively or synergistically toward the manifestation of localized myxedema.

Recurrence after surgical resection of localized myxedema deposits has been reported,[18] and surgical management of localized myxedema is not a primary treatment option. However, the provisional diagnosis in this case was a neoplastic process. Therefore we used a wide local excision to obtain definitive tissue diagnosis. Careful follow-up will assess the patient for disease resolution.

CONCLUSION

Localized myxedema is a rare and difficult to diagnose phenomenon affecting diverse locations that can easily be overlooked. An atypical dermopathy on a background of thyroid disease, especially in combination with a known precipitant after a variable time delay, should alert a physician to its possible diagnosis. Precipitants most commonly include trauma or previous surgery at the point of localized myxedema. In circumstances of uncertainty, biopsy is helpful for diagnosis.

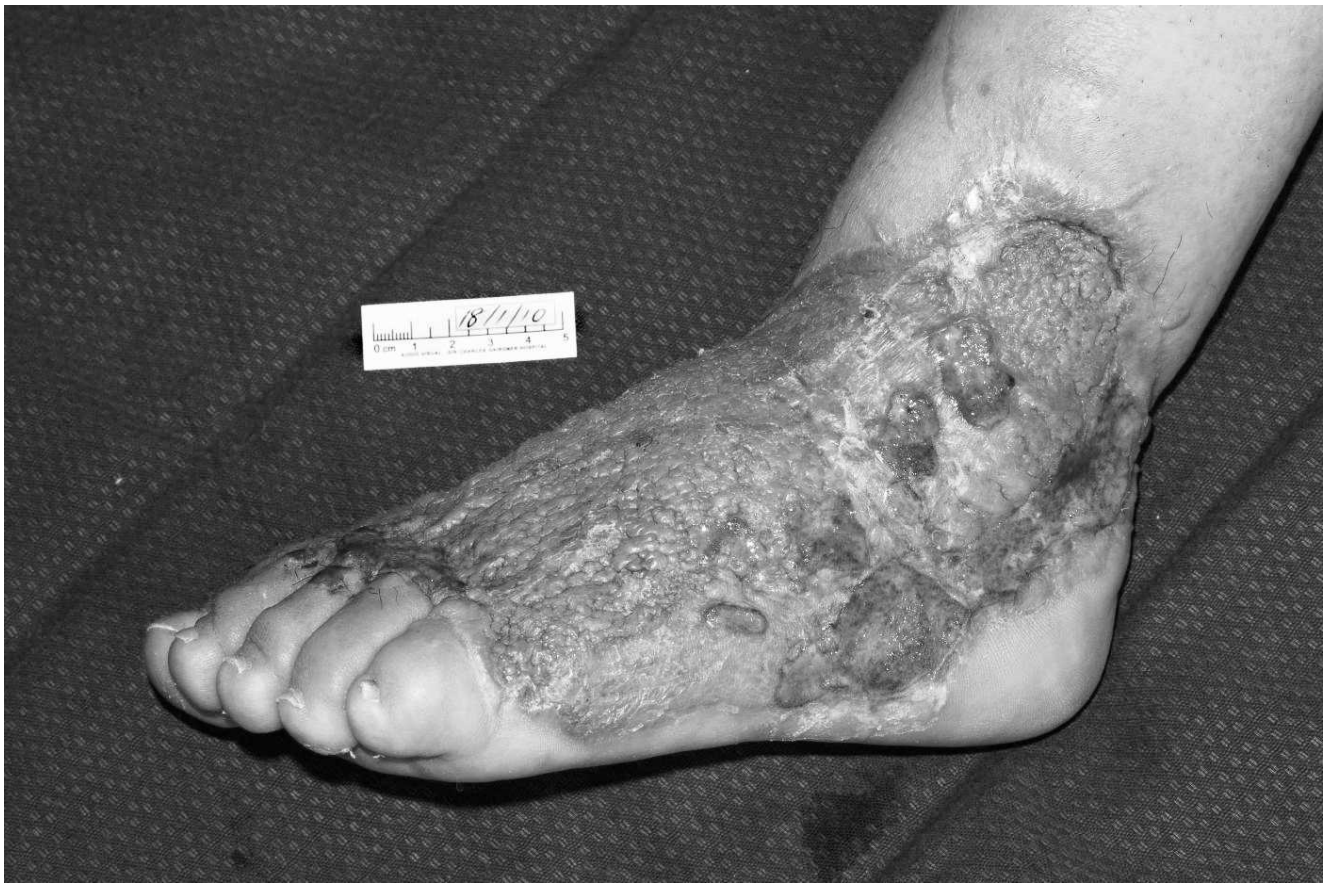

Figure 4. Healed foot after split skin graft.

Table. Documented Cases of Localized Myxedema

	Study author	Year	Site	Initial thyroid status	Hyperthyroidism treatment			Precipitants			Clinical findings at presentation		
					Previous [131I]	Previous surgery	Time delay	Trauma	Surgery	Time delay	PTM	Exoph-thalmos	Biopsy diagnosis
1	Cohen et al[2]	1963	Dorsal hands	Hyperthyroid	+	–	3 y, 9 m	P	–	–	+	+	+
2	Cohen et al[2]	1963	Forearm flexor surface	Hyperthyroid	+	–	7 m	–	–	–	+	+	+
3	Noppakun et al[3]	1986	Bilateral shoulders	Hyperthyroid	+	–	2 y, 3 m	+	–	–	+	+	+
4	Noppakun et al[3]	1986	Neck, shoulders, upper back	Hyperthyroid	–	–	–	–	–	–	+	+	–
5	Noppakun et al[3]	1986	Pinna	Hyperthyroid	+	–	1 m	–	–	–	–	–	+
6	Albers and Fenske[4]	1991	Dorsal foot/great toe	Unknown	U	U	U	U	U	U	+	U	+
7	Katsambas et al[5]	2000	Bilateral toes	Hyperthyroid	+	+	16 y	P	–	–	–	+	–
8	Hasani-Ranjbar and Mohajeri-Tehrani[6]	2008	Unilateral toe	Hyperthyroid	+	–	9 y	–	–	–	–	+	+
9	Gimlette[7]	1960	Thigh	Hyperthyroid	–	+	U	–	+	5 y	+	+	–
10	Gimlette[7]	1960	Sternum	Euthyroid	–	–	–	U	U	U	+	+	U
11	Slater[8]	1987	Thyroidectomy scar	Hyperthyroid	–	–	4 m	–	+	4 m	+	+	+
12	Akasu et al[9]	1989	Nasal dorsum	Hyperthyroid	–	–	–	P	–	–	–	+	+
13	Wright et al[10]	1990	Right first toe	Hypothyroid	–	–	–	–	+	4 m	–	–	+
14	Missner et al[11]	1990	Thigh	Hyperthyroid	–	–	–	–	+	7 y	–	–	+
15	Pujol et al[12]	1998	Thigh	Hypothyroid	–	–	–	–	+	1 m	–	–	+
16	Luczak et al	2011	Foot, thigh	Hyperthyroid	+	–	9 y	+	+	4 y, 1 m	+	+	+

PTM, pretibial myxedema; U, unknown; P, possible (see text)

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