Wound Sleuth

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An Unusual Callus Formation

Mr. A, a 50-year-old male, attended a clinic at the request of the diabetic nurse educator. He had a non-resolving callus with an atypical erosion on the proximal plantar aspect of the left first toe measuring 1.5 x 1.5 cm and a proximal ulcer measuring 0.5 x 0.5 cm.

He has a history of diabetes for 12 years, largely uncontrolled on sitagliptin and metformin (combined) and gliclazide (his A1c was 12.1 in April 2018), and hyperlipidemia and weight loss (45 kg in 2016). He had smoked one package of cigarettes per day and has managed to reduce that to half a pack, but he does not wish to quit smoking. He has palpable pulses with triphasic wave sounds on handheld doppler. Mr. A is employed in a warehouse, where he is on his feet 8 to 10 hours a day and is required to wear safety shoes.

In June 2016 he noticed an ulcer on his left toe, which was diagnosed with secondary cellulitis. It was treated with cephalexin 500 mg, four times a day. The area improved after one week of treatment with no residual ulceration.

In May 2017 a callus was first noted on the plantar surface of the foot associated with a proximal ulceration, which did not resolve with numerous debridements. A large amount of curetted surface tissue was sent for a skin biopsy. The histology revealed minimal epithelial hyperplasia, but the architectural irregularity was highly suggestive of verrucous carcinoma, a well differentiated variant of squamous cell carcinoma.

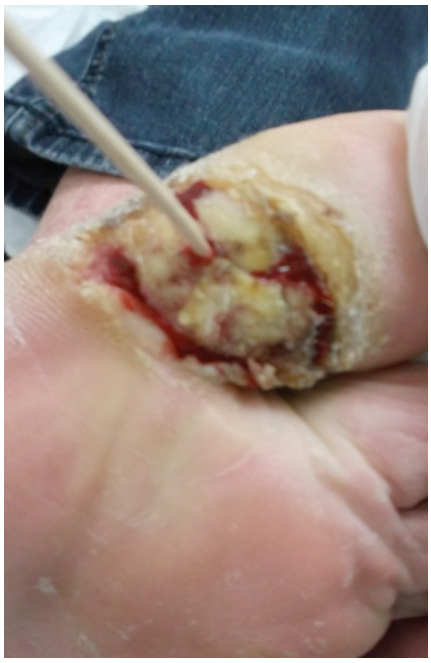

Figure 1: During debridement procedure. This callus is not over a weight-bearing surface.

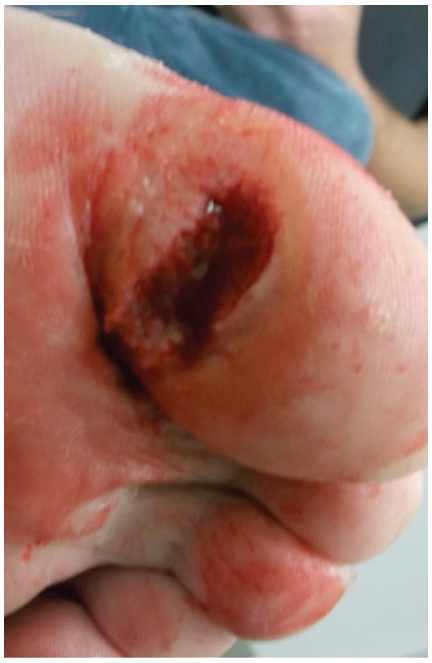

Figure 2: Post debridement. Red friable tissue and the callus re-form within 7 to 10 days.

Questions for the Reader

Q What is the cause/diagnosis? How would you investigate this patient?

A **Diagnosis**

The diagnosis on biopsy is verrucous carcinoma (epithelioma cuniculatum, or carcinoma cuniculatum).[1] This is a rare slow-growing but well-differentiated, wart-like squamous cell carcinoma (SCC). This form of

cancer can be diagnosed in the mouth, genital area and foot. It is often associated with human papillomavirus (HPV) subtypes 6, 11, 16 and 18.[1,2] These lesions are usually detected on the plantar aspect of the foot. This lesion was not on the tip of the toe but on the plantar proximal non-weight-bearing part of the foot. There was a proximal ulcer that could have formed from the rabbit-burrow type of irregular spaces that often exist within the lesions, which can be exophytic or endophytic (outward or inward growing).

Investigations

- Biopsy x 2: surface with scissors and deep with curette, and extensive electrocautery of the base
- Pressure offloading
- Plain X-ray: no osteomyelitis
- Blood work: ESR-2, CRP 0.6, and HbA1c = 10
- Swab: grew Group B *Streptococcus*, and *Staphylococcus aureus*

Q What other diagnoses/ causes would you consider?

A
- Verruca (warts) presents as a series of punctate bleeding points on the surface of the lesion. They also cause a separation of the skin-surface furrows, with the wart tissue occupying the expanded space.
- Diabetic neuropathic foot ulceration presents as a loss of epidermis with a dermal or deeper base. The callus does not have the irregular channels through the tissue, and most of the callus is on the rim of the ulcer.
- Callus formation is over pressure points and should not have punctate bleeding points.
- Deep fungus infections are often hyperkeratotic nodules on the surface of the skin, with central ulceration possible. These infections are also slow growing, and the centre of the lesions need to be biopsied for atypical mycobacteria.

Management

- Diabetes control: patient may need insulin if oral agents do not give adequate control for T2DM
- Callus control: may not be

Reference: Armstrong DG. Wrobel J. Robbins JM. Are diabetes-related wounds and amputations worse than cancer? Int Wound J. 2007:4(4):286-7. 5.

effective, as this could represent residual verrucous carcinoma

- Offloading: pneumatic walker plus orthotics in work boots
- Infection management: amoxicillin/clavulanic acid 875 mg bid, when there's evidence of deep infection according to three or more of the STONEES criteria
- Smoking cessation: but the patient is not ready to change
- Referrals:
  - to plastics for further biopsies that have so far been negative for residual verrucous carcinoma
  - to orthopedics for amputation of the left first toe only if there is residual verrucous carcinoma that cannot be adequately resected. Verrucous carcinoma can occasionally be metastatic but more usually involves local spread.

Conclusions

Mr. A was very frustrated with the lack of progress toward healing and the amount of time taken to diagnosis the problem. In this case it was just over a year, but up to 15 years has been reported in the literature. Identifying the cause proved to be challenging. His wound was not in a typical point of pressure, although a thorough gait assessment had not been performed.

The recommended plan of care was amputation of the affected toe. As Mr. A had recently lost a close relative to cancer, he wanted to consider his options carefully. Until Mr. A made the decision about amputation, this wound was classified as non-healable, with the presence of moisture increasing the possibility of the incidence of bacteria in the wound that would put the host (patient) at a greater risk of developing an infection. In this case, the goal of local wound care would be to keep the wound as free as possible from bacteria, with povidone-iodine and a dry, sterile dressing as thin as possible to prevent any increase in plantar pressure.

References

1. Lesic A, Nikolic M, Sopta I, Starcevic B, Bumbasirevic M, Atkinson HDE. Verrucous carcinoma of the foot: A case report. J. Orthop Surg (Hong Kong). 2008;16(2):251–3.
2. Schell BJ, Rosen T, Rády P, Arany I, Tschen JA, Mack MF, et al. Verrucous carcinoma of the foot associated with human papillomavirus type 16. J Am Acad Dermatol. 2001;45(1):49–55.

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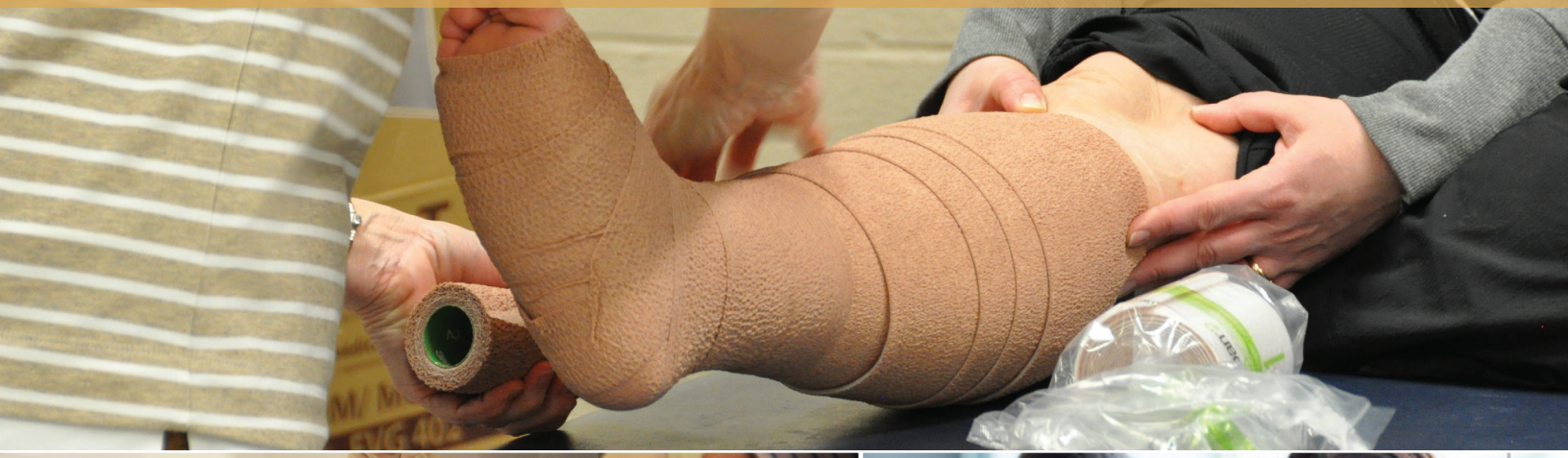

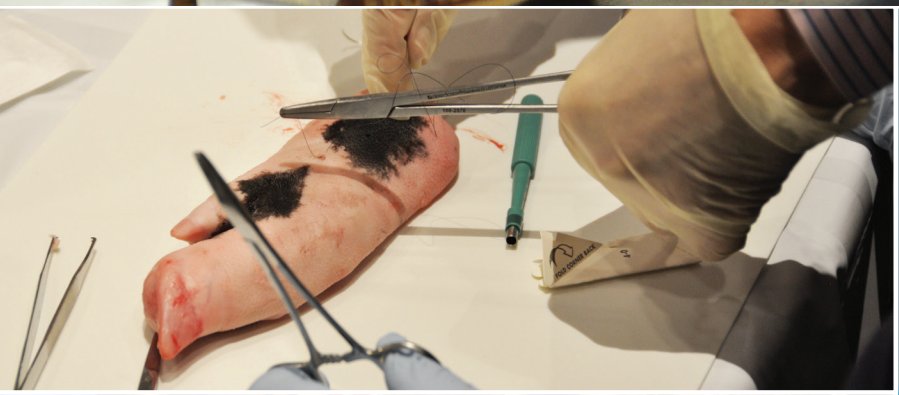

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