

Subungual squamous cell carcinoma treated by topical photodynamic therapy

Qian An, Song Zheng, Li Zhang, Xing-Hua Gao, Jiu-Hong Li

Department of Dermatology, The First Hospital of China Medical University, Shenyang, Liaoning 110000, China.

To the Editor: Squamous cell carcinoma (SCC) in the unguis apparatus is a rare neoplasm. Although it is the most prevalent malignant tumor in this region, it often presents with non-specific features that lead to misdiagnosis and delayed treatment.^[1] Various treatments have been proposed, including Mohs micrographic surgery, wide local excision with skin grafting, and amputation of the digit. Given the rarity of the condition, there is no consensus on the optimal treatment.^[2] Photodynamic therapy (PDT) has been extensively used to treat non-melanoma skin cancers, such as actinic keratosis, basal cell carcinoma, and SCC *in situ*.^[3] The difficult treatment of subungual SCC and the success rates of PDT for early SCC suggested that this treatment would be useful for treating the following patient, who was diagnosed with subungual SCC but refused surgery and was ultimately successfully treated with topical PDT.

A 66-year-old Chinese man presented with an 18-month history of progressive nail dystrophy, onycholysis, and persistent subnail purulence in his left thumb [Figure 1A]. He is a farmer who often breaks corn with his hands. An excisional biopsy specimen confirmed the presence of SCC, with tumor cells breaking through the basement membrane and invading the dermis [Figure 1B]. In addition, the atypical keratinocytes showed nuclei with some degree of pleomorphism [Figure 1C]. Immunohistochemical staining revealed that the specimen was positive for cytokeratin (CK) and CK 5/6 but negative for human melanoma black 45 and melan A, which confirmed the diagnosis [Figure 1D1–D4]. Although surgery was suggested, the patient refused. Because there was no evidence of bone involvement or metastasis, we decided to try topical PDT. The patient received five topical PDT sessions (once a week for 5 weeks).

Part of the nail plate was avulsed under ring block local anesthesia with 2% lidocaine before the treatment [Figure 1E]. Next, 20% aminolevulinic acid at a dose of

118 mg in glycerin (Shanghai Fudan-Zhangjiang Bio-Pharmaceutical Co., Ltd., Shanghai, China) was applied for 3 h to the nail bed and surrounding structures under gauze occlusion to protect it from the light. The area was then irradiated with 100 J/cm² of 635-nm red light from a diode laser (Wuhan Yage Photoelectric Technology Co., Ltd., Wuhan, China) at a fluence rate of 50 mW/cm² under ring block local anesthesia. The finger was dressed and the patient was discharged with simple analgesia.

The patient was reviewed 2 weeks after the treatment and then at 1-month intervals. The nail regrew normally and there was no clinical evidence of recurrence 10 months after treatment. The new nail was intact with no onycholysis or subnail purulence [Figure 1F]. The patient is still in follow-up.

Subungual SCC affects men more than women and usually presents in the fifth to seventh decade of life.^[4] Commonly cited risk factors include trauma, radiation, chronic paronychia, human papilloma virus infection, and dyskeratosis congenita.^[1] Our patient often does farm work and breaks corn by hand, and his nails and nail beds have been repeatedly stimulated by trauma, which may be one of the causes of the disease.

The treatment of subungual SCC is challenging. Although surgery is possible, the recurrence rate is high. Topical PDT offers effective tumor eradication and is a relatively quick, simple, and inexpensive technique.^[5]

PDT for the treatment of SCC has several limitations. Although there is some evidence of the successful treatment of SCC with topical PDT, there is also evidence of common treatment failure. In addition, there should be extreme caution surrounding PDT treatment of SCC because failure would result in more invasive and metastatic events. Hence, this technique is not routinely advocated for invasive SCC. Our patient is currently under follow-up and shows no signs of recurrence. Nonetheless, close long-term follow-up of our patient is vital.

Access this article online

Quick Response Code:



Website:
www.cmj.org

DOI:
10.1097/CM9.0000000000000723

Correspondence to: Dr. Jiu-Hong Li, Department of Dermatology, The First Hospital of China Medical University, Shenyang, Liaoning 110000, China
E-Mail: pfk12011@126.com

Copyright © 2020 The Chinese Medical Association, produced by Wolters Kluwer, Inc. under the CC-BY-NC-ND license. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Chinese Medical Journal 2020;133(7)

Received: 11-12-2019 Edited by: Yuan-Yuan Ji

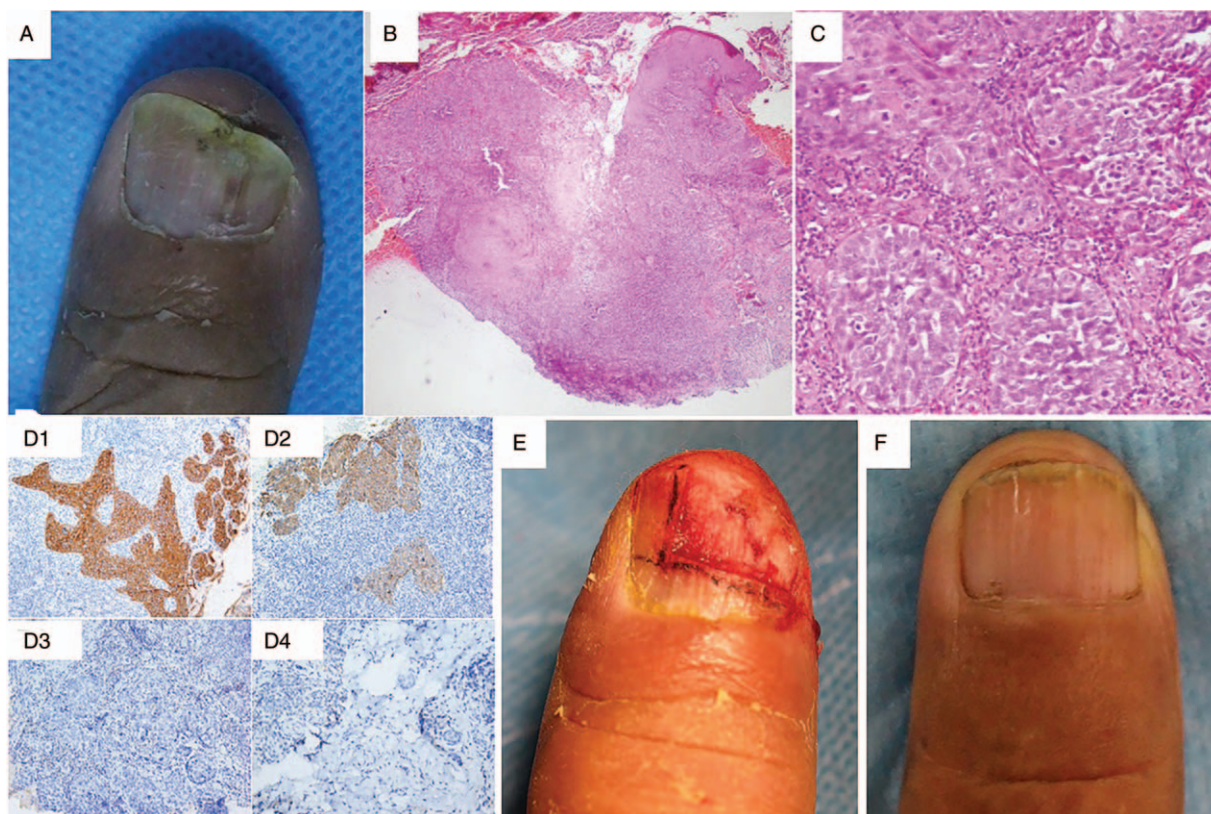


Figure 1: (A) Appearance of the left thumb before topical PDT treatment. (B) Biopsy histology demonstrating tumor cells breaking through the basement membrane and invading the dermis (hematoxylin and eosin [HE] staining, original magnification $\times 40$). (C) Atypical keratinocytes showing nuclei with some degree of pleomorphism (HE staining, original magnification $\times 200$). (D1–D4) Immunohistochemical staining revealing the specimen to be positive for CK and CK 5/6 and negative for HMB-45 and melan A (Original magnification $\times 200$). (E) Part of the nail plate has been removed to reveal an area of biopsy-proven SCC affecting the nail bed. (F) Ten months after treatment, the nail has regrown normally and there is no clinical evidence of recurrence. CK: Cytokeratin; HMB-45: Human melanoma black 45; PDT: Photodynamic therapy.

Declaration of patient consent

We certify that we have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and that, although due efforts will be made to conceal his identity, anonymity cannot be guaranteed.

Funding

This work was supported by a grant of the National Natural Science Foundation of China (No. 81903198).

Conflicts of interest

None.

References

1. Wong KY, Ching DL, Gateley D. Subungual squamous cell carcinoma. *BMJ Case Rep* 2015;7:bcr2014207565. doi: 10.1136/bcr-2014-207565.
2. Young LC, Tuxen AJ, Goodman G. Mohs' micrographic surgery as treatment for squamous dysplasia of the nail unit. *Australas J Dermatol* 2012;53:123–127. doi: 10.1111/j.1440-0960.2011.00813.x.
3. Fitzmaurice S, Eisen DB. Daylight photodynamic therapy: what is known and what is yet to be determined. *Dermatol Surg* 2016;42:286–295. doi: 10.1097/DSS.0000000000000633.
4. de Berker DA, Dahl MG, Malcolm AJ, Lawrence CM. Micrographic surgery for subungual squamous cell carcinoma. *Br J Plast Surg* 1996;49:414–419. doi: 10.1016/s0007-1226(96)90013-2.
5. Photiou L, Sinclair R. Subungual Bowen disease. Complete remission 14 years post-photodynamic therapy (PDT). *Australas J Dermatol* 2019;60:74–75. doi: 10.1111/ajd.12901.

How to cite this article: An Q, Zheng S, Zhang L, Gao XH, Li JH. Subungual squamous cell carcinoma treated by topical photodynamic therapy. *Chin Med J* 2020;133:881–882. doi: 10.1097/CM9.0000000000000723