

Background

Basal cell carcinoma (BCC) encompasses diverse histological subtypes such as superficial, nodular, and infiltrative, each potentially requiring distinct treatment approaches. Treatment options include both surgical and non-surgical interventions, including topical immunochemotherapy medications like imiquimod. Imiquimod is approved by the US Food and Drug Administration as a topical agent for the treatment of superficial BCC. By functioning as a toll-like receptor (TLR)7 and/or 8 agonist, this immunomodulator activates cytotoxic T cells and induces the type 2 helper T cell cytokine cascade, consequently destroying tumor cells. While imiquimod is a proven efficacious topical agent, obtaining histological evidence of tumor clearance remains challenging and limited literature exists on alternative methodologies for evaluating tumor clearance. Reflective confocal microscopy (RCM), a non-invasive imaging technique facilitating real-time visualization of the skin's epidermis and superficial dermis, is a promising tool for visualizing tumor clearance. A previous study by Zou et al., demonstrated the efficacy of RCM in monitoring clearance of multifocal superficial BCC after treatment with 5% imiquimod cream. However, due to imiquimod's limited cutaneous permeation, further studies are needed to verify tumor clearance. This study employs RCM to monitor tumor clearance of superficial BCC treated with 5% imiquimod cream.

References

1. Zou Y, Zhu X, Xia R. Reflectance Confocal Microscopy Follow-up of Multifocal Superficial Basal Cell Carcinomas Treated With Imiquimod 5% Cream. *Dermatol Pract Concept*. 2022 Oct 1;12(4):e2022207. doi: 10.5826/dpc.1204a207.

Methods and Materials

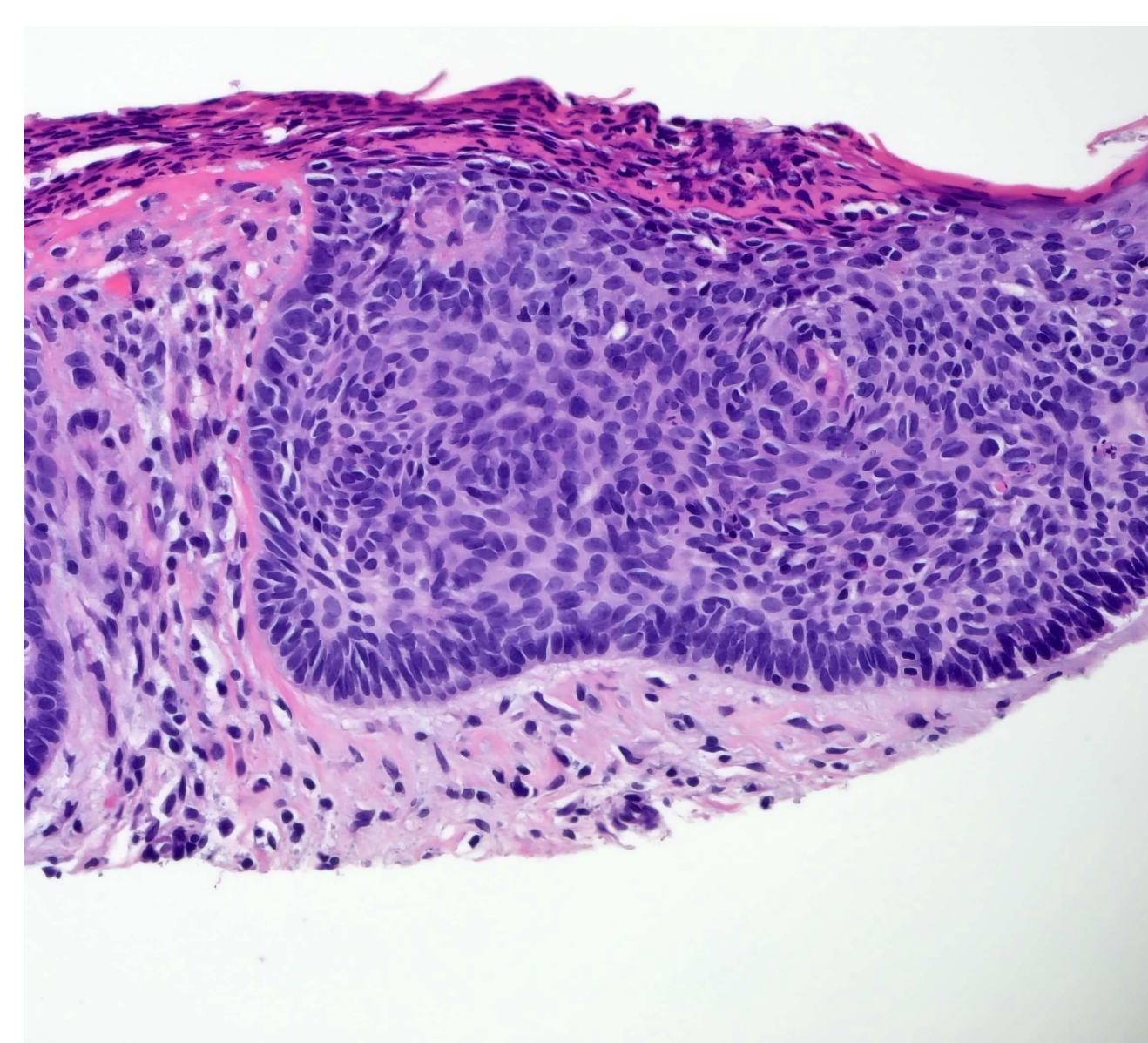
Patients diagnosed with histologically confirmed superficial BCC and currently undergoing treatment with 5% imiquimod cream were recruited to participate in the study. Only individuals aged 18 and above without other known compromising skin or immunological conditions were included. Informed consent was collected prior to initiating the study. After an initial six-week period of treatment with 5% imiquimod cream, real-time scan sequences were captured using RCM. Additional RCM images were captured at six-week intervals if prolonged treatment was necessary.

Results

Prior to treatment

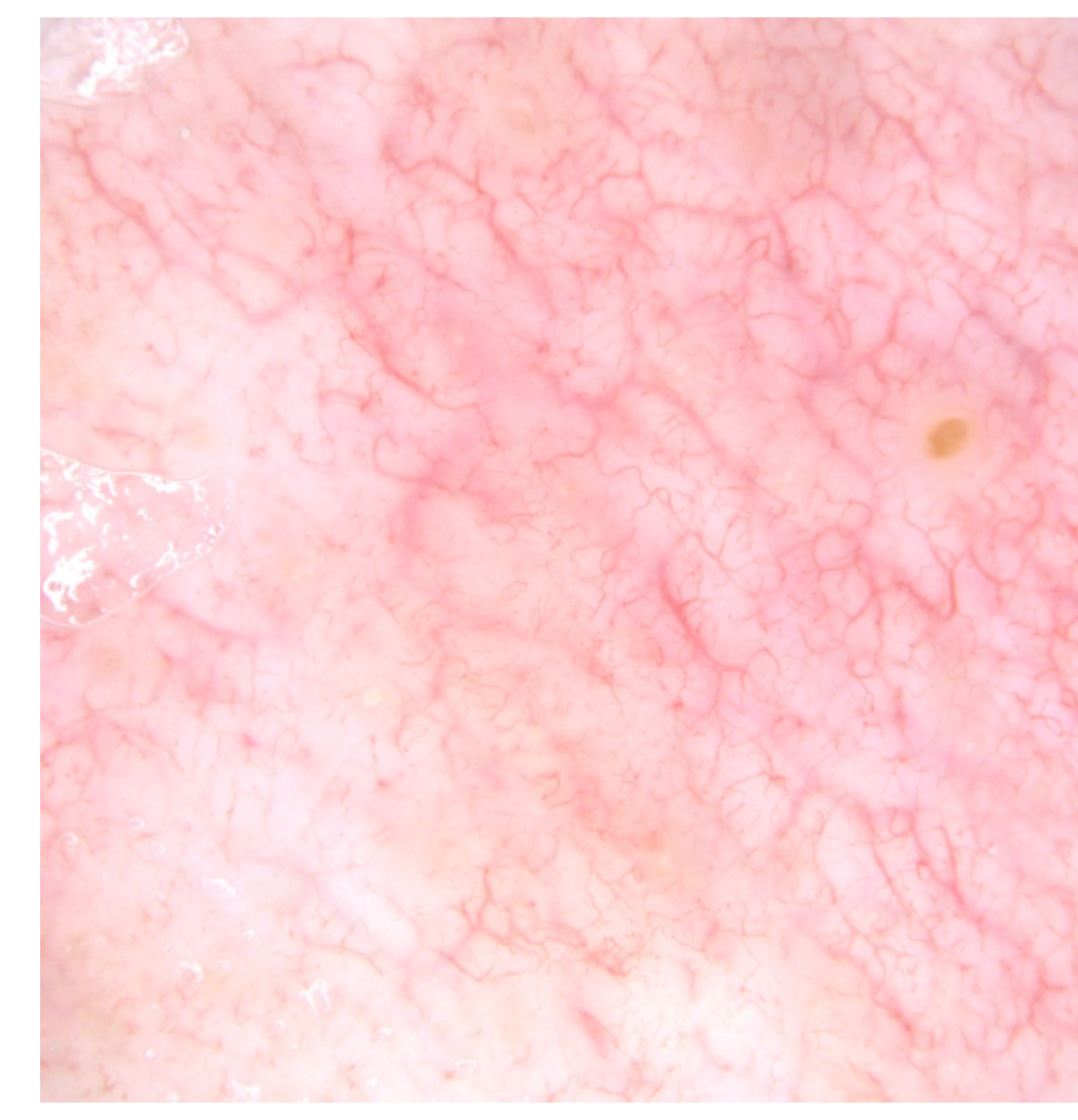


Clinical image prior to biopsy and treatment

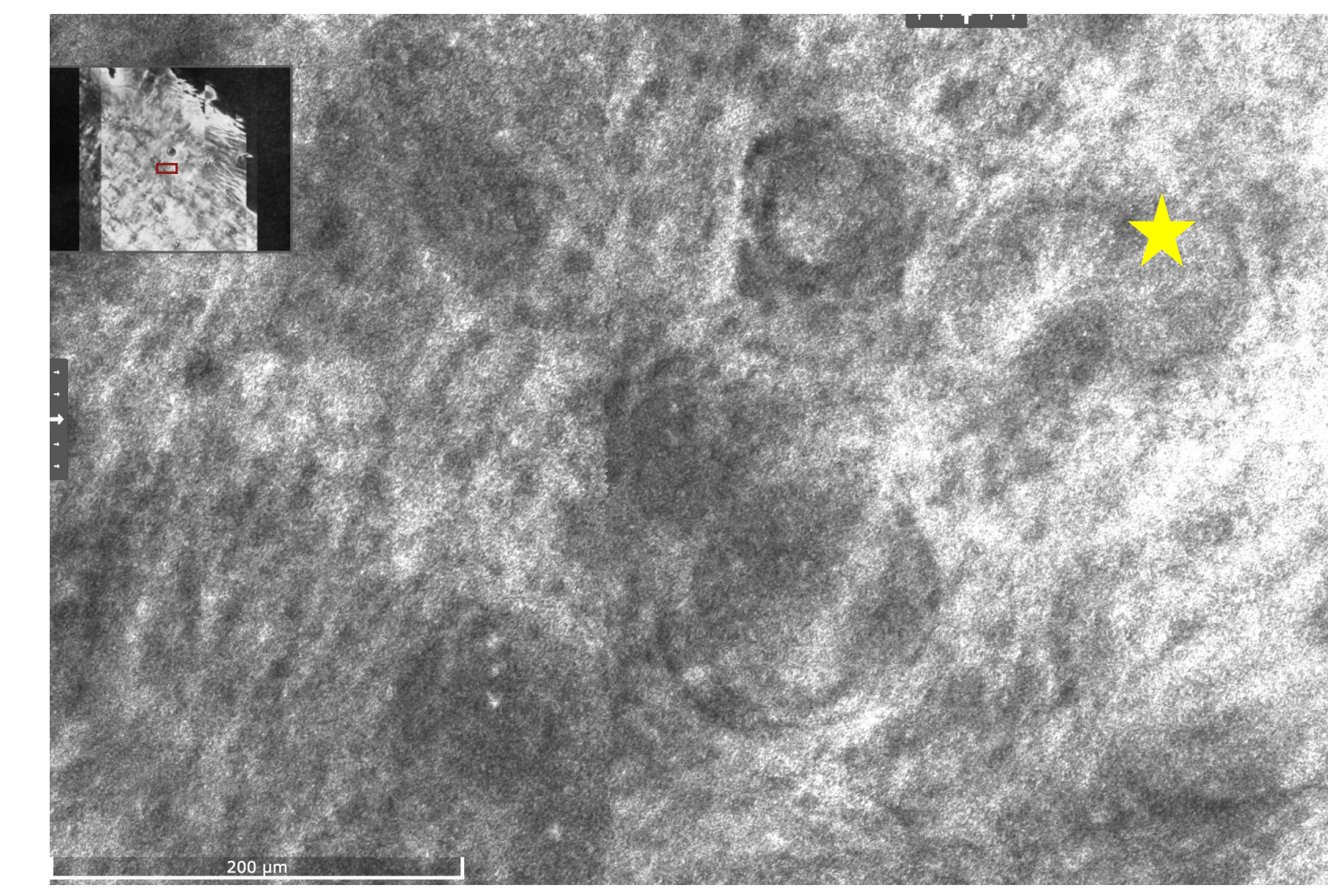


Histologically confirmed Superficial BCC

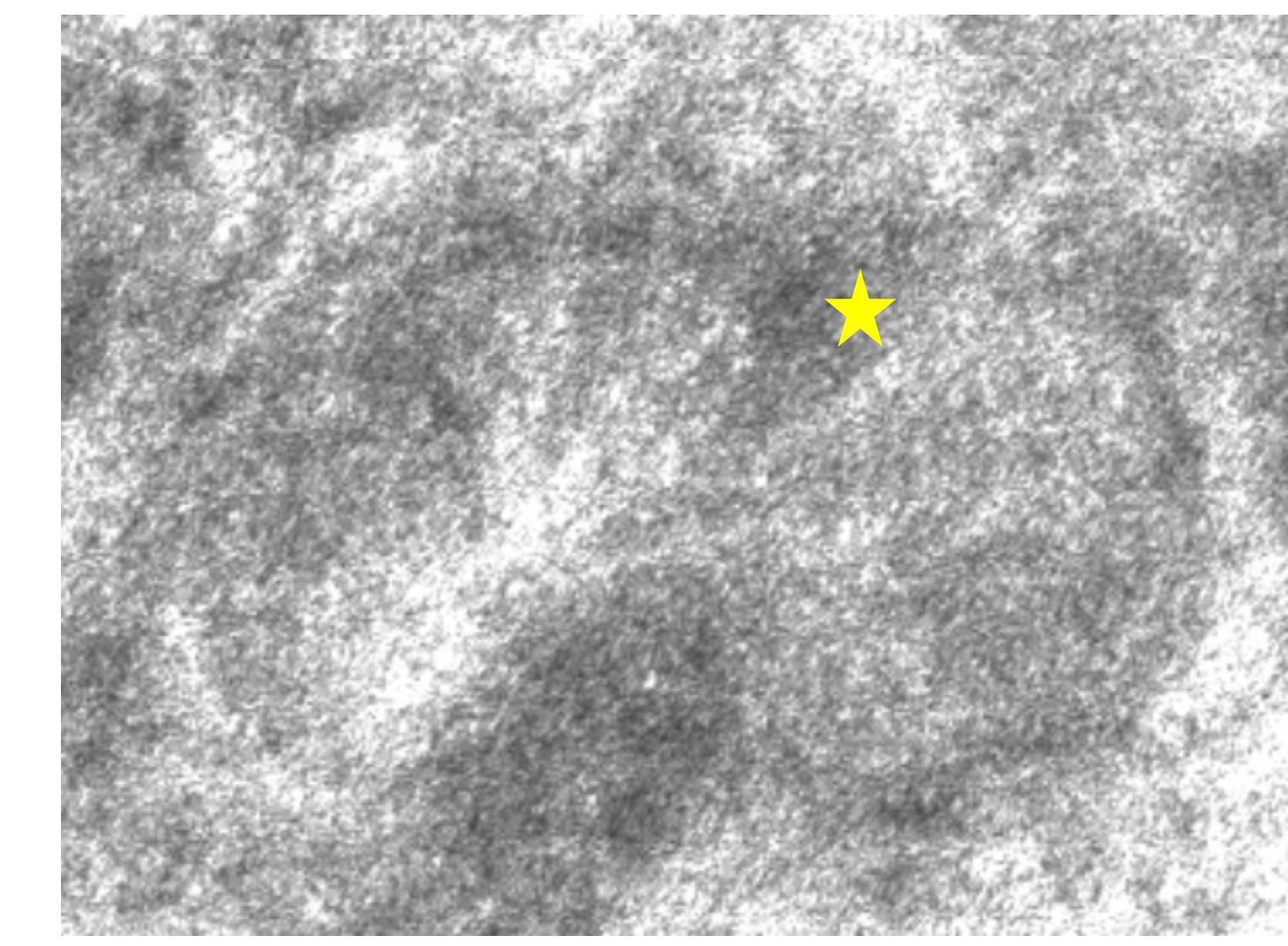
After 6 weeks of Topical Imiquimod



Dermoscopy image after 6 weeks of topical imiquimod

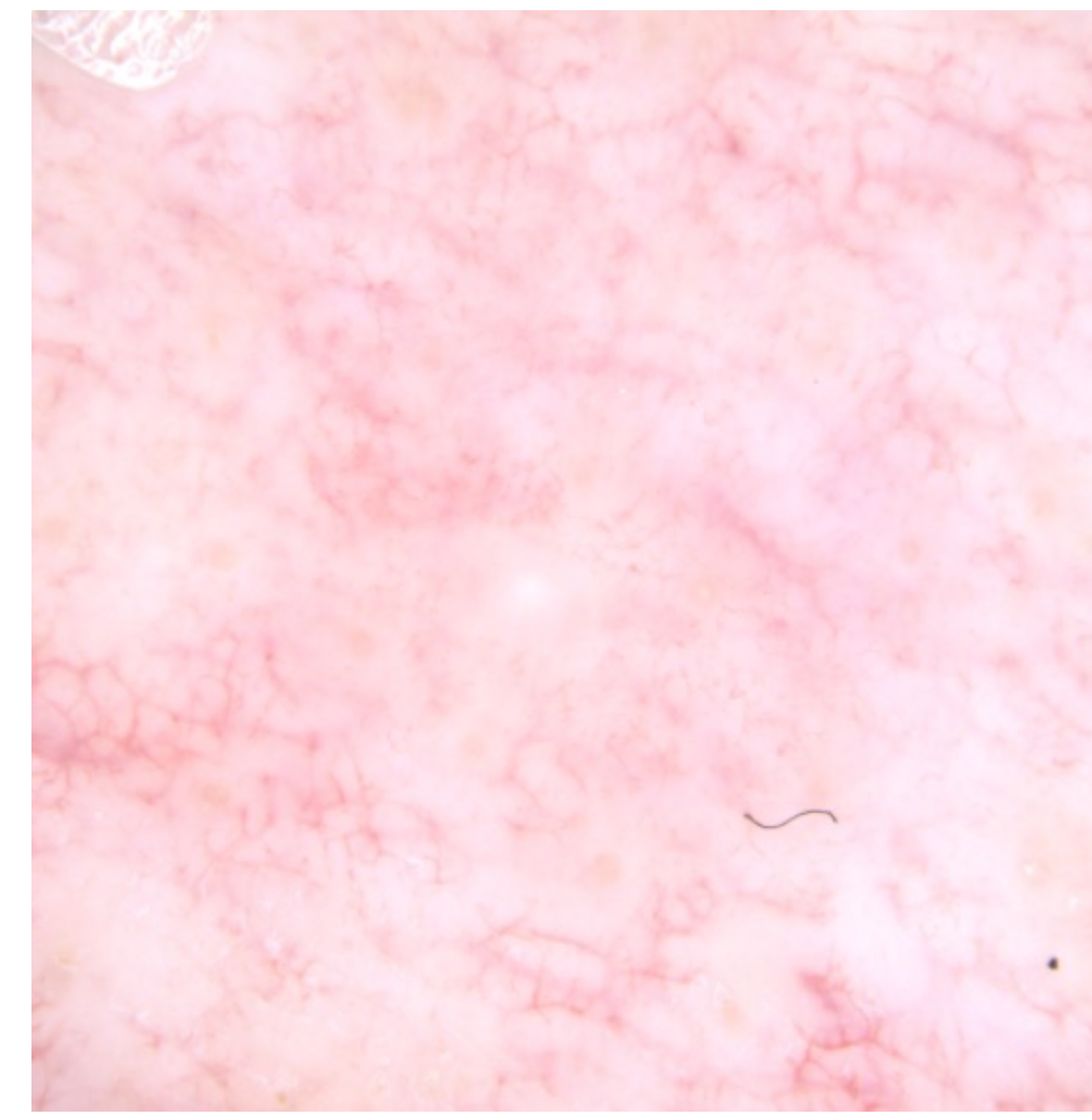


Confocal image shows refractile small bright cells, representing lymphocytes, and a palisading arrangement of cells, representing residual basal cell, at low magnification

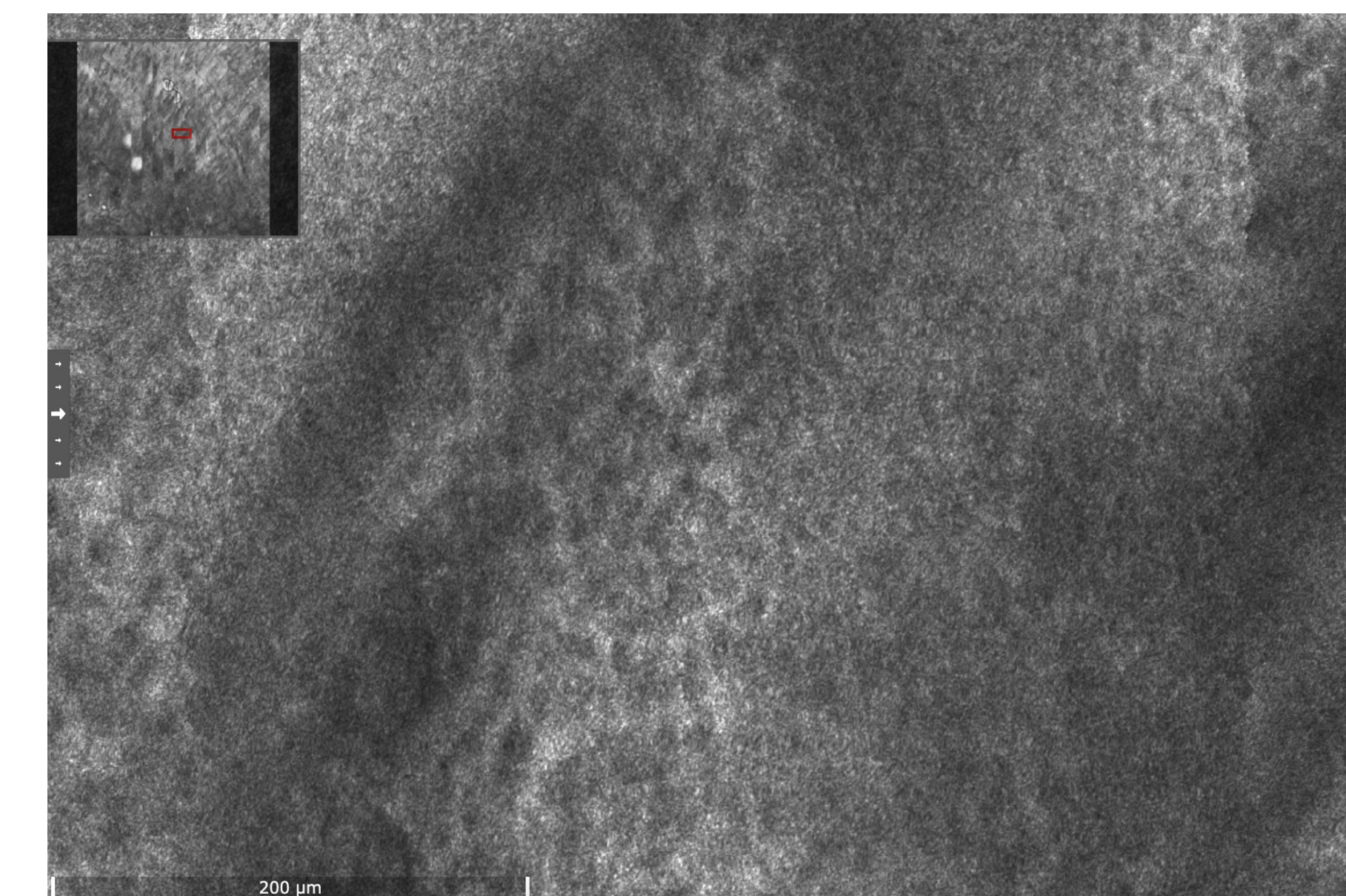


Confocal image showing a palisading arrangement of cells at high magnification

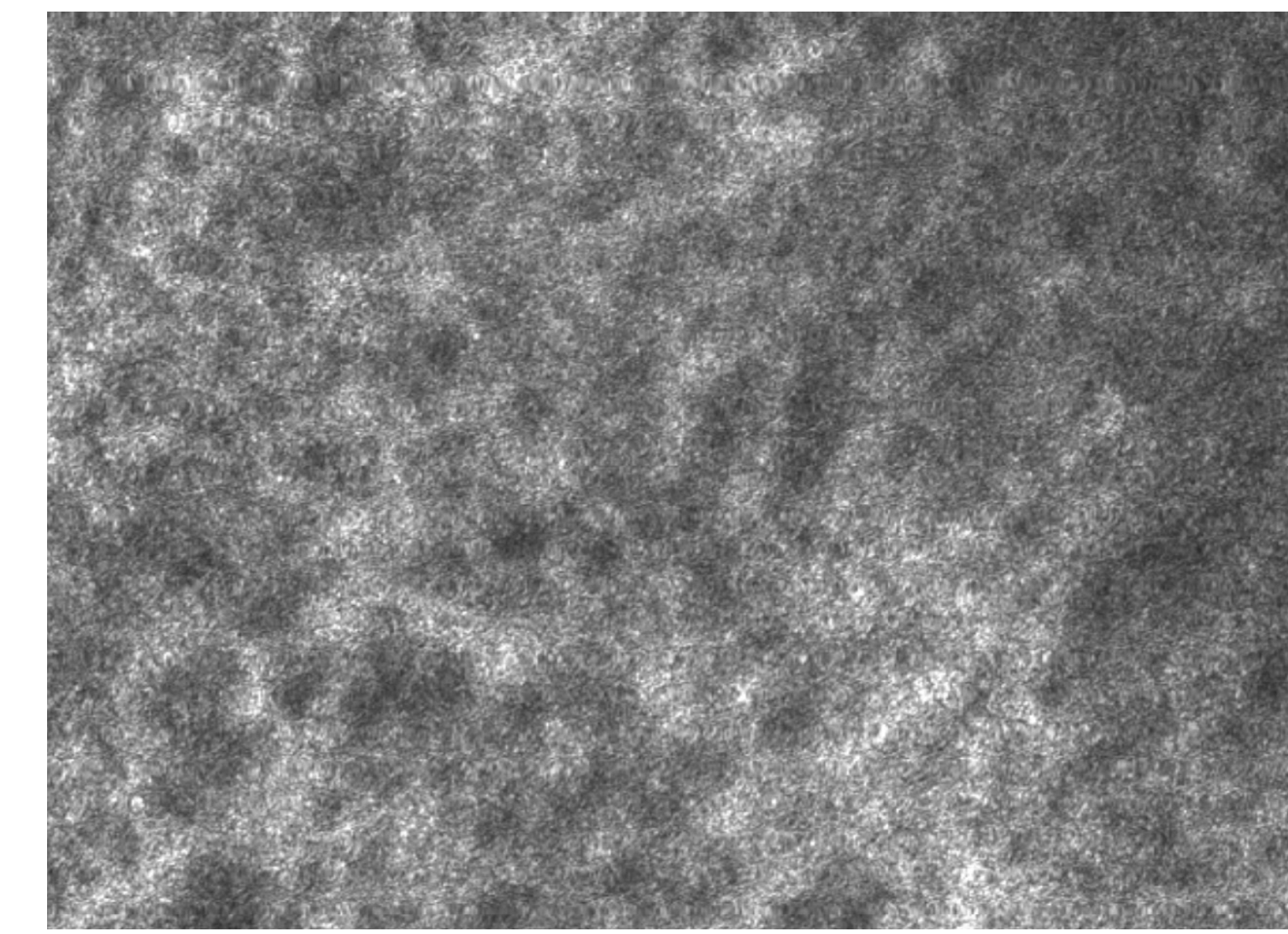
After 12 weeks of Topical Imiquimod



Dermoscopy image after 12 weeks of topical imiquimod



Confocal image shows dermal fibrosis with no evidence of BCC, at low magnification



Confocal image shows dermal fibrosis with no evidence of BCC, at high magnification

Future Direction

RCM facilitated visualization of tumor clearance in a case of superficial BCCs treated with 5% imiquimod. However, given imiquimod's limited cutaneous permeation depth, its approval is restricted to the treatment of superficial BCC. Therefore, future studies are needed to explore strategies that may enhance permeation and intradermal delivery of imiquimod.

Acknowledgments

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