

# The Clinical Utility of Tele dermatology in Triage and Diagnosing Skin Malignancies: Case Series

Kimberly A. Sable, MD; Sarah A. Korger, MD; Yaohui G. Xu, MD, PhD; Daniel D. Bennett, MD; Molly A. Hinshaw, MD; Anne E. Rosin, MD

## PRACTICE POINTS

- Tele dermatology via store-and-forward technology has been demonstrated to be effective in assessing and triaging various cutaneous malignancies.
- The use of tele dermatology has increased because of the COVID-19 pandemic and may be useful for specific vulnerable populations.
- When used appropriately, tele dermatology may function as a useful resource to triage patients requiring in-person evaluation for the diagnosis of aggressive skin malignancies and may aid in reducing the time to diagnosis of various skin cancers.

With the increasing utilization of telemedicine since the COVID-19 pandemic, it is critical that clinicians have an appropriate understanding of the application of virtual care resources, including tele dermatology. We present a case series of 3 patients to demonstrate the clinical utility of tele dermatology in reducing the time to diagnosis of various rare and/or aggressive cutaneous malignancies, including Merkel cell carcinoma, malignant melanoma, and atypical fibroxanthoma. Cases were obtained from one large Midwestern medical center during the month of July 2021. Each case presented includes a description of the initial tele dermatology presentation and reviews the clinical timeline from initial consultation submission to in-person clinic visit with lesion biopsy. This case series demonstrates real-world examples of how tele dermatology can be utilized to expedite the care of specific vulnerable patient populations.

**T**ele dermatology is a rapidly growing digital resource with specific utility in triaging patients to determine those requiring in-person evaluation for early and

accurate detection of skin malignancies. Approximately one-third of tele dermatology consultations result in face-to-face clinical encounters, with malignant neoplasms being the leading cause for biopsy.<sup>1,2</sup> For specific populations, such as geriatric and immunocompromised patients, tele dermatology may serve as a valuable tool, particularly in the wake of the COVID-19 pandemic. Furthermore, telemedicine may aid in addressing health disparities within the field of medicine and ultimately may improve access to care for vulnerable populations.<sup>3</sup> Along with increasing access to specific subspecialty expertise, the use of tele dermatology may reduce health care costs and improve the overall quality of care delivered to patients.<sup>4,5</sup>

We describe the clinical utility of tele dermatology in triaging and diagnosing skin malignancies through a series of 3 cases obtained from digital image review at one large Midwestern medical center during the month of July 2021. Three unique cases with a final diagnosis of a rare or aggressive skin cancer were selected as examples, including a 75-year-old man with Merkel cell carcinoma, a 55-year-old man with aggressive pT3b malignant melanoma, and a 72-year-old man with an atypical fibroxanthoma. A clinical timeline of each case is presented, including the time intervals from initial image submission to image review, image submission to face-to-face clinical encounter, and image submission to final diagnosis. In all cases, the primary care provider submitted an order for tele dermatology, and the tele dermatology team obtained the images.

## Case Series

*Patient 1*—Images of the right hand of a 75-year-old man with a medical history of basal cell carcinoma were submitted

From the Department of Dermatology, University of Wisconsin, Madison. Drs. Korger, Xu, and Rosin also are from William S. Middleton Memorial Veterans Hospital, Madison.

The authors report no conflict of interest.

Correspondence: Kimberly A. Sable, MD, Department of Dermatology, University of Wisconsin, One S Park St, 7th Floor, Madison, WI 53715 (ksable@uwhealth.org).

Cutis. 2024 May;113(5):211-213. doi:10.12788/cutis.1000

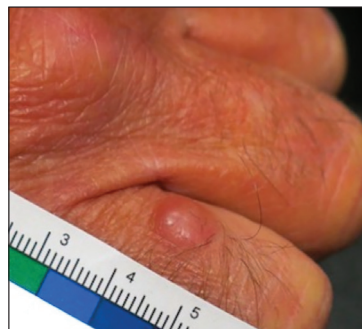
for teledermatology consultation utilizing store-and-forward image-capturing technology (day 1). The patient history provided with image submission indicated that the lesion had been present for 6 months and there were no associated symptoms. Clinical imaging demonstrated a pink-red pearly papule located on the proximal fourth digit of the dorsal aspect of the right hand (Figure 1). One day following the teledermatology request (day 2), the patient's case was reviewed and triaged for an in-person visit. The patient was brought to clinic on day 34, and a biopsy was performed. On day 36, dermatopathology results indicated a diagnosis of Merkel cell carcinoma. On day 37, the patient was referred to surgical oncology, and on day 44, the patient underwent an initial surgical oncology visit with a plan for wide local excision of the right fourth digit with right axillary sentinel lymph node biopsy.

**Patient 2**—Images of the left flank of a 55-year-old man were submitted for teledermatology consultation via store-and-forward technology (day 1). A patient history provided with the image indicated that the lesion had been present for months to years and there were no associated symptoms, but the lesion recently had changed in color and size. Teledermatology images were reviewed on day 3 and demonstrated a 2- to 3-cm brown plaque on the left flank with color variegation and a prominent red papule protruding centrally (Figure 2). The patient was scheduled for an urgent in-person visit with biopsy. On day 6, the patient presented to clinic and an excision biopsy was performed. Dermatopathology was ordered with a RUSH indication, with results on day 7 revealing a pT3b malignant melanoma. An urgent consultation to surgical oncology was placed on the same day, and the patient underwent an initial surgical oncology visit on day 24 with a plan for wide local excision with left axillary and inguinal sentinel lymph node biopsy.

**Patient 3**—Images of the left ear of a 72-year-old man were submitted for teledermatology consultation utilizing review via store-and-forward technology (day 1). A patient history indicated that the lesion had been present for 3 months with associated bleeding. Image review demonstrated a solitary pearly pink papule located on the crura of the antihelix (Figure 3). Initial teledermatology consultation was reviewed on day 2 with notification of the need for in-person evaluation. The patient presented to clinic on day 33 for a biopsy, with dermatopathology results on day 36 consistent with an atypical fibroxanthoma. The patient was scheduled for Mohs micrographic surgery on day 37 and underwent surgical treatment on day 64.

## Comment

Teledermatology consultations from all patients demonstrated adequate image quality to be able to evaluate the lesion of concern and yielded a request for in-person evaluation with possible biopsy (Table). In this case series, the average time interval from teledermatology consultation placement to teledermatology image report was 2 days (range, 1–3 days). The average time from teledermatology consultation placement to face-to-face encounter



**FIGURE 1.** A lesion of concern on the fourth digit of the dorsal aspect of the right hand that initially was evaluated via teledermatology and later was diagnosed as Merkel cell carcinoma (patient 1).



**FIGURE 2.** A lesion of concern on the left flank that initially was evaluated via teledermatology and later was diagnosed as a pT3b malignant melanoma (patient 2).



**FIGURE 3.** A lesion of concern on the left ear that initially was evaluated via teledermatology and later was diagnosed as atypical fibroxanthoma (patient 3).

with biopsy was 24.3 days for the 3 cases presented in this series (range, 6–34 days). The initial surgical oncology visits took place an average of 34 days after the initial teledermatology consultation was placed for the 2 patients requiring referral (44 days for patient 1; 24 days for patient 2). For patient 3, Mohs micrographic surgery was required for treatment, which was scheduled by day 37 and subsequently performed on day 64.

When specifically looking at the diagnosis of cutaneous malignancies, studies have found that the incidence of skin cancer detection is similar for teledermatology compared to in-person clinic visits.<sup>6,7</sup> Creighton-Smith et al<sup>6</sup> performed a retrospective cohort study comparing prebiopsy and postbiopsy diagnostic accuracy and detection rates of skin cancer between store-and-forward

### Timeline of Teledermatology Visits for Lesions of Concern in 3 Patients

Stage of review	Patient 1	Patient 2	Patient 3
Initial image submission to image review	Day 1	Day 3	Day 2
Initial image submission to face-to-face clinical encounter	Day 34	Day 6	Day 33
Initial image submission to final diagnosis	Day 36	Day 7	Day 36
Diagnosis	Merkel cell carcinoma	pT3b malignant melanoma	Atypical fibroxanthoma
Treatment	WLE (day 44) <sup>a</sup>	WLE (day 24) <sup>a</sup>	MMS (scheduled day 37; performed day 64)

Abbreviations: MMS, Mohs micrographic surgery; WLE, wide local excision.

<sup>a</sup>Referred to surgical oncology.

technology and face-to-face consultation. When adjusting for possible compounding factors including personal and family history of skin cancer, there was no notable difference in detection rates of any skin cancer, including melanoma and nonmelanoma skin cancers. Furthermore, the 2 cohorts of patients were found to have similar prebiopsy and postbiopsy diagnostic concordance, with similar times from consultation being placed to requested biopsy and time from biopsy to final treatment.<sup>6</sup>

Clarke et al<sup>7</sup> similarly analyzed the accuracy of store-and-forward teledermatology and found that there was overall concordance in diagnosis when comparing clinical dermatologists to teledermatologists. Moreover, when melanocytic lesions were excluded from the study, the decision to biopsy did not differ substantially.<sup>7</sup>

Areas of further study include determining what percentage of teledermatology lesions of concern for malignancy were proven to be skin cancer after in-person evaluation and biopsy, as well as investigating the effectiveness of teledermatology for melanocytic lesions, which frequently are removed from analysis in large-scale teledermatology studies.

Although teledermatology has substantial clinical utility and may serve as a great resource for specific populations, including geriatric patients and those who are immunocompromised, it is important to recognize notable limitations. Specifically, brief history and image review should not serve as replacements for a face-to-face visit with physical examination in cases where the diagnosis remains uncertain or when high-risk skin malignancies are suspected or included in the differential. Certain aggressive cutaneous malignancies such as Merkel cell carcinoma may appear as less aggressive via teledermatology due to restrictions of technology.

### Conclusion

Teledermatology has had a major impact on the way health care is delivered to patients and may increase

access to care, reducing unnecessary in-person visits and decreasing the number of in-person visit no-shows. With the appropriate use of a brief clinical history and image review, teledermatology can be effective to evaluate specific lesions of concern. We report 3 unique cases identified during a 1-month period at a large Midwestern medical center. These cases serve as important examples of the application of teledermatology in reducing the time to diagnosis of aggressive skin malignancies. Further research on the clinical utility of teledermatology is warranted.

**Acknowledgments**—The authors thank the additional providers from the University of Wisconsin and William S. Middleton Memorial Veterans Hospital (both in Madison, Wisconsin) involved in the medical care of the patients included in this case series.

### REFERENCES

- Bianchi MG, Santos A, Cordioli E. Benefits of teledermatology for geriatric patients: population-based cross-sectional study. *J Med Internet Res*. 2020;22:E16700.
- Mortimer S, Rosin A. A retrospective review of incidental malignancies in veterans seen for face-to-face follow-up after teledermatology consultation. *J Am Acad Dermatol*. 2021;84:1130-1132.
- Costello CM, Cumsy HJL, Maly CJ, et al. Improving access to care through the establishment of a local, teledermatology network. *Telemed J E Health*. 2020;26:935-940. doi:10.1089/tmj.2019.0051
- Lee JJ, English JC 3rd. Teledermatology: a review and update. *Am J Clin Dermatol*. 2018;19:253-260. doi:10.1007/s40257-017-0317-6
- Hadeler E, Beer J, Nouri K. The influence of teledermatology on health care access and equity. *J Am Acad Dermatol*. 2021;84:E219-E220. doi:10.1016/j.jaad.2020.12.036
- Creighton-Smith M, Murgia RD 3rd, Konnikov N, et al. Incidence of melanoma and keratinocytic carcinomas in patients evaluated by store-and-forward teledermatology vs dermatology clinic. *Int J Dermatol*. 2017;56:1026-1031. doi:10.1111/ijd.13672
- Clarke EL, Reichenberg JS, Ahmed AM, et al. The utility of teledermatology in the evaluation of skin lesions. *J Telemed Telecare*. 2023;29:382-389. doi:10.1177/1357633X20987423