

Letter

Overcalling a teledermatology selfie: a new twist in a growing field

Keenan Hogan, Jarrod Cullan, Vikas Patel, Anand Rajpara, Daniel Aires*

Dermatology Online Journal 21 (6): 17

University of Kansas Medical Center

Correspondence:

Daniel Aires MD JD
Director, Dermatology
University of Kansas Medical Center
daires@kumc.edu

Abstract

Teledermatology via patient-generated digital images or “selfies” has been increasing since the advent of portable devices capable of high resolution image capture. During these early days, doctors and patients are learning about uses and limitations. We describe a case in which a patient's selfie led three attending physicians to suspect an iatrogenic hematoma requiring urgent assessment. There was no hematoma at follow up, simply dark and smooth adherent crust, which was gently removed to reveal a well-healing wound. This case introduces a previously undescribed teledermatology-related issue, that of “overcalling” a selfie. An image supplied by a patient misleadingly appeared to show a serious complication requiring urgent treatment.

Introduction

Overall occurrence of postoperative hematomas following dermatologic surgery has been reported to be between 0.26% and 0.45% by two studies involving 4,329 patients [1, 2]. Several factors affect the likelihood of hematoma development, including age, postoperative activity, medications, bleeding disorders, and other comorbidities [3]. Elevated blood pressure has been associated with increased risk of postoperative hemorrhage in cutaneous surgery in some studies, but conflicting data has also been reported [4, 5]. Evidence implicating anticoagulation medications is more consistent. Use of aspirin or other NSAIDs is not definitively associated with increased risk of moderate-to-severe bleeding complications, whereas clopidogrel or warfarin carry a significantly increased risk [6, 7, 8].

The risk of postoperative hemorrhage, including hematoma, is greatest within 48 hours of surgery [3]. Hematomas have the potential to lead to infection, dehiscence, and necrosis, but patients can be educated to watch for warm, growing, often painful masses and to immediately contact the office to arrange evaluation. Depending on the stage of hematoma evolution and other clinical factors, the hematoma may be aspirated, incised and drained, or evacuated with ligation of the appropriate vessel [9].

Case synopsis

A 63-year-old woman presented for excision of a basal cell carcinoma from the right cheek. A rotational flap was used for optimal functional and aesthetic outcome; the patient tolerated the procedure well. A pressure dressing was applied and the patient was sent home. On day six post-op, the patient contacted the clinic with complaints of swelling, crusting, and pain. She emailed a photo to the clinic, which appeared to show a large moist red hematoma overlying the surgical site (Figure 1). The patient urgently returned to the clinic and was evaluated in person. A thin, adherent, smooth, dark crust was found, which was easily removed, revealing a well-healing wound. Sutures were intact and the site appeared to be healing as expected (Figure 2).

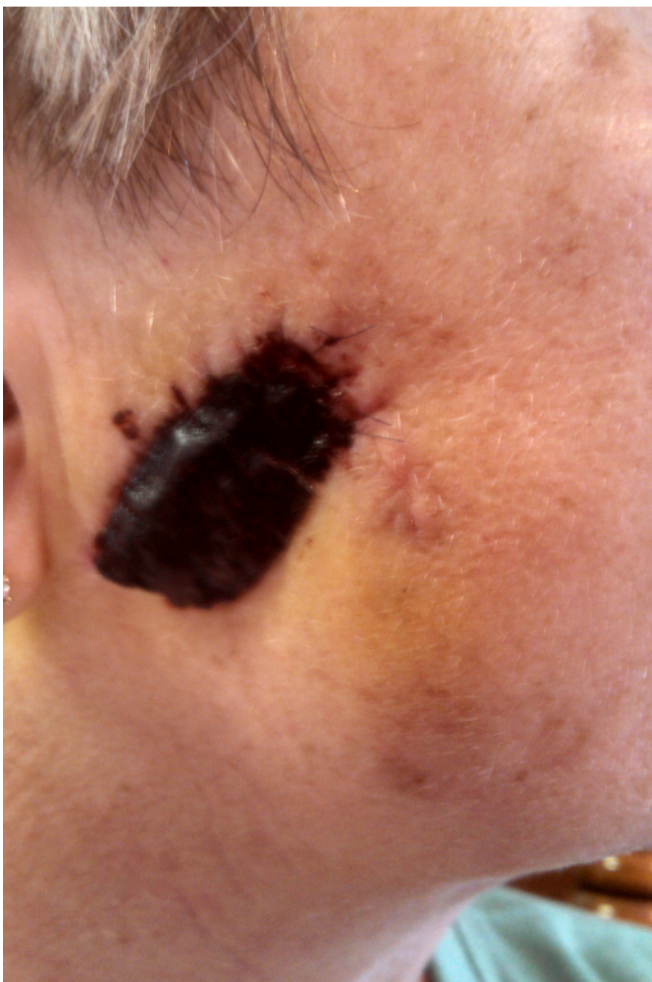


Figure 1. Moist red hematoma-like tissue overlying excision site **Figure 2.** Healing incision with granulation tissue removed

Discussion

Thirty-seven teledermatology programs were active in the United States at the start of 2012, primarily in the store-and-forward modality at academic institutions [10]. Several unique applications of the technology have been demonstrated, including inpatient consultation [11], off-site melanoma screening [12], chronic wound management [13], and many more. The prevalence of smart phones with built-in cameras promises to expand the utilization of teledermatology via patient selfies. This will likely spur further investigation into the benefits and limitations of the technology.

Cited benefits of teledermatology include cost-effectiveness and reduced time to treatment, though certain conditions are required in assuming the practice is cost-effective [14, 15]. A benefit of particular note is avoiding unnecessary hospital or clinic visits. Multiple studies have demonstrated the use of mobile-phone digital images for postoperative follow up of local surgical complications, principally hematomas and blood-stained bandages [16, 17]. Reported success varies between studies and larger sample sizes are needed, but some believe this can help assuage patient concerns while avoiding unneeded trips to caregiver sites. Yet, although some reports claim teledermatology provides similar clinical outcomes as conventional clinical consultations, one such study specifies that patients randomized to teledermatology required nearly identical numbers of subsequent hospital visits [18].

In general, a high concordance has been reported for teledermatology in comparison to face-to-face visits [19, 20, 21]. When limited to adequate management recommendations, rather than correct diagnosis, success rates have been reported as high as 98 percent [22]. However, a meta-analysis of 78 separate studies by Warshaw *et al.* highlights that clinical consultations still provide better diagnostic accuracy [14]. For a subset of patients, teledermatology may serve as a convenient and accepted method of delivering care [23]. Patients seem to be satisfied by the care they receive with teledermatology [14, 17], and lack of experience or comfort with the modality does not seem to present a significant concern for diagnosing physicians [24]. Nevertheless, some concerns remain.

Primarily, the quality of the digital image limits the ability to properly visualize and assess skin lesions [25]. A significant correlation has been demonstrated between image quality and correct diagnosis [26, 27]. As average camera-phone resolution

improves, the accuracy discrepancy between clinical consultations and teledermatology may diminish [28, 29]. Additionally, demographic changes may provide a patient population that is increasingly comfortable and proficient in the use of mobile phone image capture. To further enhance the utility of patient-captured digital images, several strategies have been tested.

Including a clinical questionnaire provides additional information for use in diagnosis and treatment management, with a demonstrated correlation between the quality of information provided and correct diagnosis [26]. Patients have also been provided with a tutorial regarding technique and technology [30]. A small study suggests that patients can be trained to acquire images of good quality, as determined by dermatologists, simply through an online tutorial [31]. Furthermore, patients can be encouraged to provide multiple images since one study showed that dermatologists were better able to modify treatment and prevent hospital visits for postoperative patients when provided with multiple images [17].

This case introduces an additional teledermatology-related issue, that of “overcalling” a selfie. An image supplied by a patient misleadingly appeared to show a serious complication requiring urgent treatment. Our extensive literature search did not find prior work addressing this topic. The overall prevalence and impact of this issue remains ill-defined, but merits further study.

Conclusion

Selfie teledermatology is a potentially valuable tool in the practice of dermatology. Expanded use of teledermatology should be combined with a sufficient training, technology, and communication infrastructure, and tempered by investigation into its limitations.

References

1. O'Neill JL, Taheri A, Solomon JA, Pearce DJ. Postoperative hemorrhage risk after outpatient dermatologic surgery procedures. *Dermatol Surg*. 2014 Jan;40(1):74-6. [PMID:24237907]
2. Bordeaux JS, Martires KJ, Goldberg D, Pattee SF, Fu P, Maloney ME. Prospective evaluation of dermatologic surgery complications including patients on multiple antiplatelet and anticoagulant medications. *J Am Acad Dermatol*. 2011 Sep;65(3):576-83. [PMID:21782278]
3. Bunick CG, Aasi SZ. Hemorrhagic complications in dermatologic surgery. *Dermatol Ther*. 2011 Nov-Dec;24(6):537-50. [PMID:22515669]
4. Dzubow LM. Blood pressure as a parameter in dermatologic surgery. *Arch Dermatol*. 1986 Dec;122(12):1406-7. [PMID:3789773]
5. Shimizu I, Jellinek NJ, Dufresne RG, Li T, Devarajan K, Perlis C. Multiple antithrombotic agents increase the risk of postoperative hemorrhage in dermatologic surgery. *J Am Acad Dermatol*. 2008 May;58(5):810-6. [PMID:18423258]
6. Hurst EA, Yu SS, Grekin RC, Neuhaus IM. Bleeding complications in dermatologic surgery. *Semin Cutan Med Surg*. 2007 Dec;26(4):189-95. [PMID:18395666]
7. Cook-Norris RH, Michaels JD, Weaver AL, Phillips PK, Brewer JD, Roenigk RK, Otley CC. Complications of cutaneous surgery in patients taking clopidogrel-containing anticoagulation. *J Am Acad Dermatol*. 2011 Sep;65(3):584-91. [PMID:21514003]
8. Lewis KG, Dufresne RG Jr. A meta-analysis of complications attributed to anticoagulation among patients following cutaneous surgery. *Dermatol Surg*. 2008 Feb;34(2):160-5. [PMID:18093204]
9. Nguyen TH, Erickson QL. In: Hemostasis. *Surgery of the skin*. 2nd ed. Robinson JK, Hanke CW, Siegel DM, Fratila A, editors. Mosby Elsevier; New York, NY: 2010. pp. 225–238.
10. Armstrong AW, Wu J, Kovarik CL, Goldyne ME, Oh DH, McKoy KC, Shippy AM, Pak HS. State of teledermatology programs in the United States. *J Am Acad Dermatol*. 2012 Nov;67(5):939-44. [PMID:22459360]
11. Barbieri JS, Nelson CA, James WD, Margolis DJ, Littman-Quinn R, Kovarik CL, Rosenbach M. The Reliability of Teledermatology to Triage Inpatient Dermatology Consultations. *JAMA Dermatol*. 2014 Apr;150(4):419-24. [PMID:24522374]
12. Massone C, Hofmann-Wellenhof R, Ahlgrimm-Siess V, Gabler G, Ebner C, Soyer HP. Melanoma Screening with Cellular Phones. *PLoS ONE*. 2007 May;2(5):e483. [PMID:17534433]
13. Chanussot-Deprez C, Contreras-Ruiz J. Telemedicine in Wound Care: A Review. *Adv Skin Wound Care*. 2013 Feb;26(2):78-82. [PMID:23337648]
14. Warshaw EM, Hillman YJ, Greer NL, Hagel EM, MacDonald R, Rutks IR, Wilt TJ. Teledermatology for diagnosis and management of skin conditions: a systematic review. *J Am Acad Dermatol*. 2011 Apr;64(4):759-72. [PMID:21036419]
15. Whited JD. Teledermatology research review. *Int J Dermatol*. 2006 Mar;45(3):220-9. [PMID:16533219]
16. Martínez-Ramos C, Cerdán MT, López RS. Mobile phone-based telemedicine system for the home follow-up of patients undergoing ambulatory surgery. *Telemed J E Health*. 2009 Jul-Aug;15(6):531-7. [PMID:19566396]

17. Pérez F, Montón E, Nodal MJ, Viñoles J, Guillen S, Traver V. Evaluation of a mobile health system for supporting postoperative patients following day surgery. *J Telemed Telecare*. 2006;12 Suppl 1:41-3. [PMID:16884576]
18. Wootton R, Bloomer SE, Corbett R, Eedy DJ, Hicks N, Lotery HE, Mathews C, Paisley J, Steele K, Loane MA. Multicentre randomised control trial comparing real time teledermatology with conventional outpatient dermatological care: societal cost-benefit analysis. *BMJ*. 2000 May;320(7244):1252-6. [PMID:10797038]
19. Lasierra N, Alesanco A, Gilaberte Y, Magallón R, García J. Lessons learned after a three-year store and forward teledermatology experience using internet: Strengths and limitations. *Int J Med Inform*. 2012 May;81(5):332-43. [PMID:22425394]
20. Rubegni P, Nami N, Cevenini G, Poggiali S, Hofmann-Wellenhof R, Massone C, Bilenchi R, Bartalini M, Cappelli R, Fimiani M. Geriatric teledermatology: store-and-forward vs. face-to-face examination. *J Eur Acad Dermatol Venereol*. 2011 Nov;25(11):1334-9. [PMID:21349115]
21. Edison KE, Ward DS, Dyer JA, Lane W, Chance L, Hicks LL. Diagnosis, diagnostic confidence, and management concordance in live-interactive and store-and-forward teledermatology compared to in-person examination. *Telemed J E Health*. 2008 Nov;14(9):889-95. [PMID:19035797]
22. Börve A, Holst A, Gente-Lidholm A, Molina-Martinez R, Paoli J. Use of the mobile phone multimedia messaging service for teledermatology. *J Telemed Telecare*. 2012 Jul;18(5):292-6. [PMID:22802521]
23. Fabbrocini G, Vita VD, Pastore F, D'Arco V, Mazzella C, Annunziata MC, Cacciapuoti S, Mauriello MC, Monfrecola A. Teledermatology: From Prevention to Diagnosis of Nonmelanoma and Melanoma Skin Cancer. *Int J Telemed Appl*. 2011;2011: 125762. [PMID:21776252]
24. Edison KE, Dyer JA, Whited JD, Mutrux R. Practice Gaps—The Barriers and the Promise of Teledermatology. *Arch Dermatol*. 2012 May;148(5):650-1. [PMID:22782163]
25. Chung P, Yu T, Scheinfeld N. Using cellphones for teledermatology, a preliminary study. *Dermatology Online Journal*. 2007 Jul;13(3):2. [PMID:18328196]
26. Weingast J, Scheibböck C, Wurm EM, Ranharter E, Porkert S, Dreiseitl S, Posch C, Binder M. A prospective study of mobile phones for dermatology in a clinical setting. *J Telemed Telecare*. 2013 Jun;19(4):213-8. [PMID:24163062]
27. High WA, Houston MS, Calobrisi SD, Drage LA, McEvoy MT. Assessment of the accuracy of low-cost store-and-forward teledermatology consultation. *J Am Acad Dermatol*. 2000 May;42(5):776-83. [PMID:10775853]
28. Zuo KJ, Guo D, Rao J. Mobile teledermatology: a promising future in clinical practice. *J Cutan Med Surg*. 2013 Nov-Dec;17(6):387-91. [PMID:24138974]
29. Nami N, Massone C, Rubegni P, Cevenini G, Fimiani M, Hofmann-Wellenhof R. Concordance and Time Estimation of Store-and-forward Mobile Teledermatology Compared to Classical Face-to-face Consultation. *Acta Derm Venereol*. 2015 Jan;95(1):35-9. [PMID:24889827]
30. Rimmer T, Blozik E, Fischer Casagrande B, Von Overbeck J. Digital skin images submitted by patients: an evaluation of feasibility in store-and-forward teledermatology. *Eur J Dermatol*. 2010 Sep-Oct;20(5):606-10. [PMID:20634171]
31. Qureshi AA, Brandling-Bennett HA, Giberti S, McClure D, Halpern EF, Kvedar JC. Evaluation of digital skin images submitted by patients who received practical training or an online tutorial. *J Telemed Telecare*. 2006;12(2):79-82. [PMID:16539754]