

Assessment of electric burns wound dimensions using a smartphone-based application - Imitomeasure in wound assessment

Kanav Gupta ¹, Ravi Kumar Chittoria ^{2*}, Padmalakshmi Bharathi Mohan ³, Jacob Antony Chakiath ⁴, Sushil Nepali ⁵

¹MBBS, MS DNB General Surgery, Senior Resident, Department of Plastic Surgery, JIPMER, Puducherry, India.

²Professor & Registrar, Head of IT Wing and Telemedicine, Department of Plastic Surgery & Telemedicine, JIPMER, Pondicherry, India.

³MBBS, MS DNB General Surgery, MCh Plastic Surgery, Assistant Professor, Department of Plastic Surgery, JIPMER, Puducherry, India.

⁴MBBS MS General Surgery, Senior Resident, Department of Plastic Surgery, JIPMER, Puducherry, India.

⁵MBBS, Junior Resident, Department of General Surgery, JIPMER, Puducherry, India.

***Correspondence Author:** Ravi Kumar Chittoria, Professor & Registrar, Head of IT Wing and Telemedicine, Department of Plastic Surgery & Telemedicine, JIPMER, Pondicherry, India.

Received Date: May 06, 2024 | **Accepted Date:** May 22, 2024 | **Published Date:** July 31, 2024

Citation: Kanav Gupta, Ravi Kumar Chittoria, Padmalakshmi Bharathi Mohan, Jacob Antony Chakiath, Sushil Nepali, (2024), Assessment of electric burns wound dimensions using a smartphone-based application - Imitomeasure in wound assessment, *Clinical Trials and Case Studies*, 3(4); DOI:10.31579/2835-835X/068

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Abstract:

Dimensions of wounds can be measured using several methods such as a photograph, a comparison, a ruler, or a graph. Current generation smartphones have high quality in-built cameras, and they are easily accessible than before and have become affordable. Making use of certain applications built for these smartphones have helped achieve various benefits in medical field. A software called Imitomeasure has been developed for the purpose of measuring wound dimensions without touching the wound. This app has the advantage over clinical measurement using rule or tape, in that, it is a non-contact method, hence less chances of spreading infection to that patient. The effectiveness of Imitomeasure has been assessed, and it has been found to be a very effective application in measuring wound dimensions. In this study, the size of wounds over scalp region has been measured using Imitomeasure application in a smartphone.

Keywords: imitomeasure application; wound dimension; measurement

Introduction

Better quality cameras are available in smart phones in recent times, most of which are quite affordable. The benefits of implying smart phone based application in healthcare is that they can be easily carried to every places. Softwares such as Imitomeasure have been found to be very helpful in assessing wounds of patients. They have the advantage of being non-contact and decreases the chances of spreading the infections to the patients which arises in physical methods like rulers or inchtapes. In this case report, an electric burns wound over the scalp region of a patient has been assessed using the Imitomeasure application.

Materials and Methods

Informed written consent was obtained from the patient and permission obtained from departmental ethical committee for performing this study. An 8 year old male presented with Electric burns causing ulceration on the scalp. He did not have any other known comorbidities at presentation. He was admitted and daily dressing was done. Initially hydrodissection was done with normal saline. Then application of silver stream was done.

Then hydrocyn aqua gel was applied. Collagen sheets were applied over the wound. Then packing done with gauzes and pads, and opsite. Negative pressure wound therapy was applied with continuous regulated oxygen therapy. The wound of the patient has been assessed using the Imitomeasure application. We have performed this study on iPhone 14 plus using Imitomeasure application downloaded for free from Apple store.

To install the application the following steps are done:

1. To search for "Imitomeasure" on apple store/play store, and install the application
2. Two modes are available - Calibration mode and manual mode
3. There are certain markers for calibration which is available in the application which has to be printed out. This print out has to be used while taking pictures for calibration mode
4. If the assessment is being done in manual method, select the part where the wound is present. Then capture photos of the wound.

5. After taking photo, draw the outline of the wound, and click measure, then the area of the wound will be measured.

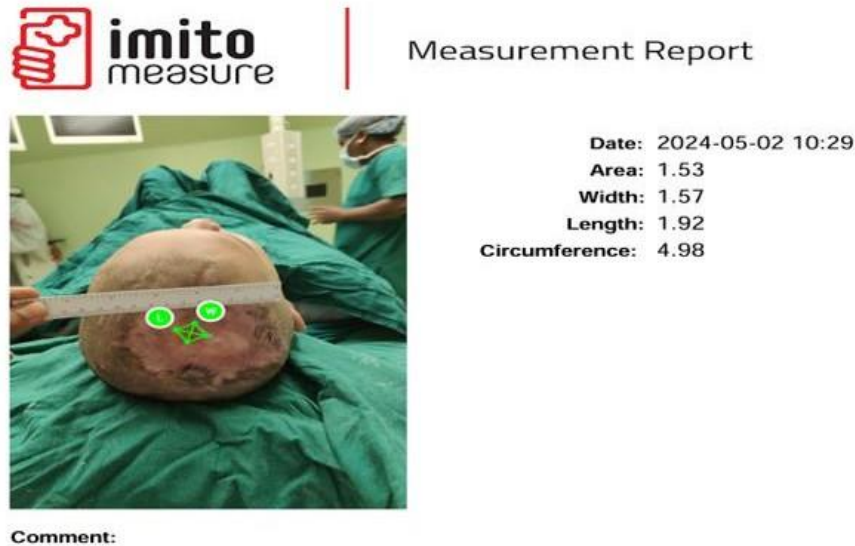


Figure 1: Figure showing measurement of area and circumference of a burns wound over scalp region using Imitomeasure software

Results

It has been found that the Imitomeasure application can provide almost accurate wound dimensions without touching the wound, and it can be used to serially monitor the progression of the wound condition.

Discussion

Assessment of wound parameters such as wound dimensions is important for understanding the progression of wounds. Various dressing materials and dressing methods are being tried for improving wound healing. However, the benefits of the methods could be assessed by how the wound heals. Serially checking the dimensions of the wounds is one helpful method to see if the wound is healing or worsening, which can be seen as decrease or increase in wound dimensions respectively. Clinically, wound dimensions can be measured using a ruler or inchtape, but these methods can increase the risk of contamination of the wounds. Hence, a method where measurement of wound dimensions can be done without touching wounds shall be beneficial. Imitomeasure software has been found to be an affordable, and highly effective mobile based application, which uses the camera inbuilt in smartphones, and can measure the dimensions of the wounds accurately. In this study, one wound of a patient with burn injury over the right gluteal region was assessed using imitomeasure application, and the results were found to be accurate. The accuracy of this application can be confirmed by performing a large scale study, which may allow the usage of this application universally, and it shall indeed be a very useful tool for monitoring wound status.

Conclusion

One wound of a patient with burns injury over the scalp region has been assessed in this study. The benefits and reliability of this application can be substantiated by performing larger studies using this application.

References

1. Haghpanah S, Bogie K, Wang X, Banks PG, Ho CH (2006). Reliability of electronic versus manual measurement techniques. *Arch Phys Med Rehabil* ; 87: 1396-1402.
2. Chitoria RK, Kumar P, Baljaj SP, Singh AK, Gupta DK (2014). General clinical guidelines for wound management: Redefining acronym SWCR. *Journal of SWCR*. 2014; 7(1): 2-7.
3. Shetty R, Sreekar H, Lamba S, Gupta AK (2012). A novel and accurate technique of photographic wound measurement. *Indian J Plast Surg*; 45(2): 425- 429.
4. Majeske C. Reliability of wound surface area measurement. *PhyTher*. 1992; 72: 138-141.
5. Mayrovitz HN, Soontupe LB (2009). Wound area by computerized planimetry of digital images. *Adv Skin Wound Care*. 2009; 22: 222-229.
6. Pandey S, Chitoria RK, Mohapatra DP, et al (2016). Application of digital planimetry: A novel technique of wound measurement in diabetic foot ulcer. *Dermatology International*. 2016; 21: 343-331.
7. Pires IM, Garcia NM (2015). Wound area assessment using mobile application. Proceedings of the International Conference on Biomedical Electronics and Devices - Volume 1: SmartMedDev, *International Conference on Biomedical Electronics and Devices*; January 12- 15; Lisbon, Portugal. 2015. pp. 271-282.

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