RESEARCH LETTER

Evaluation of a Newly Developed Mobile Device Application for Creating and Storing a Rhinoplasty Operative Report

Rhinoplasty necessitates use of a varied spectrum of techniques tailored to each patient’s anatomic characteristics. To understand and describe surgical techniques better, rhinoplasty surgeons have been using pictorial records instead of text descriptions. However, because paper records are commonly filed or scanned to a personal computer and uploaded to an electronic medical record system, it is difficult to quickly retrieve information for retrospective review. To overcome the shortcomings of a paper-based system, we created an application named “Rhinograph” that runs on a mobile device. The aim of this study was to evaluate the efficacy of this new rhinoplasty operative recording system.

Methods | Overview and Format of the Rhinograph Operative Recording System. A new record is created by entering the following data: (1) basic information about the operation, (2) drawings of the preoperative analysis and surgical procedures (Figure 1A), and (3) procedural details and signature (Figure 1B). To depict the patient’s preoperative status and the surgical procedures, users can draw black, red, or blue lines and adjust their shape and thickness. Text descriptions can also be added.

After an operative record has been created, it can be modified and updated. It can also be converted to a PDF file and e-mailed (Figure 2). The database is designed to be exported as an HTML document for further analysis.

Evaluation of the Rhinograph Application. From January to June 2013, 8 rhinoplasty surgeons recorded their operative data immediately on completion of a surgical procedure using...
Rhinograph on an iPad (Apple Computer Inc). After performing at least 5 operations, each surgeon filled in a 12-item questionnaire, rating on a 5-point scale (much worse, worse, same as paper, better, much better).

**Results** | Surgeons had higher mean (SD) satisfaction compared with conventional paper for the following 5 items: convenience of storage and retrieval (4.0 [0.9]), template function (3.2 [0.5]), security of patient information (3.5 [0.5]), portability and utility (3.5 [0.8]), and ease of statistical analysis (3.2 [0.7]). The following 5 items were rated the same as paper: user interface (3.0 [0.8]), convenience of drawing (3.0 [1.1]), convenience of modifying record (2.9 [1.0]), resident education (3.1 [0.4]), and ease of communication with other medical staff (3.1 [0.6]). Surgeons were not satisfied with recording time (2.6 [0.9]). The overall rating of the application was the same as paper (3.1 [0.6]).

**Discussion** | For decades, computers have been used to create and store databases, but the software focuses on the analysis of preoperative facial photos and has no portability or is intended for use on personal digital assistants, which have almost disappeared from the market. Although the overall satisfaction with Rhinograph was similar, participants reported higher satisfaction compared with a paper-based recording system for storage, retrieval, template function, protection of privacy, portability, and statistical analysis. However, the participating surgeons were less satisfied with the recording time, which was somewhat longer than the time needed for the paper-based recording system. This result might have been due to hardware limitations and/or lack of experience.

In summary, we used mobile device technology to design an application that will help surgeons easily document the surgical procedure, learn and teach surgical techniques, and analyze the data. The application overcomes the shortcomings of previously developed programs and enables easy storage and transfer of data to other devices such as personal computers.

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