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DIGITAL WOUND IMAGE ANALYSIS

Dubravko Huljev¹, Davor Antonić², Damir Filko².

¹Clinical Hospital «Sveti Duh» (Zagreb, Croatia)

²Faculty of Electrical Engineering (Osijek, Croatia)

Introduction: Accurate wound measurement is important task in chronic wound treatment, because changes of wound size and tissue types are indicators of the healing progress. Towards elimination of subjective wound parameters estimation, we developed color image processing software witch analyze digital wound image, and based on learned tissue samples perform tissue classification. Information about the percentage of each tissue is important determining factor for wound healing progress.

Methods: Initially five wound experts classified wound tissue type on 50 randomized digital wound images. Classification were repeated three times during three weeks, and mean percentage of tissue type were calculated for each wound. This way tissue types were determined and on these classification we developed advanced statistical pattern recognition algorithm based on color information which were implemented in application. Application also includes the therapy proposition module, implemented as the fuzzy expert system with 36 rules.

Result: result of the analysis contains the wound image represented in pseudo colors as well as percentage of tissue types within the wound area. Local wound treatment is proposed based on calculated tissue percentages and user defined amount of wound exudation, the depth of wound and infection. Accuracy of digital image analysis is more than 90%.

Conclusion: Developed application for digital wound image analysis gives objective, reliable and reproducible results, allowing unique and objective comparison of treatment results between different methods and different institutions.

