Relative optical density image analysis of digitized radiograms for tibial fracture healing monitoring

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1. Introduction

The purpose of the study was to evaluate the ability of new method (RODIA System) to quantify fracture-healing progress on digital images of subsequent radiographs without previous X-ray standardization.

2. Methods

Collections of digitized radiographs of 24 tibial fracture patients treated with various methods of fixation (including Zespol, Carboelastofix, IM rod) were analyzed to quantify the healing progress until complete union occurred. Fracture Healing Monitor Module of Relative Optical Density Image Analysis (RODIA) System [1] was utilized for images evaluation.

3. Results

Healing rate curves were drawn from analyzed data. Monthly progress of healing was determined. Following average values of optical density in fracture gap were calculated: after first month of treatment 28.53% OD (STD 15.24), after second month 26.46% OD (STD 13.7), and 18.69% OD (14.06) after third month of treatment. The highest rate of healing was observed after first and second months of treatment. Negative charged values suggested healing arrest and delayed union prediction.

4. Conclusion

Developed Relative Optical Density Image Analysis System (RODIA System) allows analyzing and measure digitized X-ray image to reliably enhance of fracture healing progress evaluation.

Reference


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