

Can a Standardized “Squat-and-Smile” Assessment Avoid Radiographic Check and Increase Follow-up Rate of Trauma Patients in Hardship Areas?

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Purpose: In low income countries, especially in remote/rural areas (“hardship areas”) the rates of follow-up of surgical orthopaedic patients are extremely low because of several reasons: poor road system, lack of transportation, unaffordable costs, safety issues due to war, and tribal clashes. Therefore, most of the patients are not able to access the referral facility for follow-up radiographs. This leads to the impossibility to detect at an early stage complications such as nonunion, malunion, and deformity. A "squat-and-smile" clinical assessment has been proposed as a proxy for fracture healing after lower extremity long-bone fractures treated with interlocking nails. The purpose of this study is to highlight the positive relationship between a standardized "squat-and-smile" clinical assessment and the bone healing confirmed through a radiologic evaluation, in order to establish a protocol that does not require access to radiology and that allows to increase the follow-up rates in hardship areas.

Methods: The investigation was performed at the referral hospital of a rural area, from July 2018 to January 2020. We retrospectively analyzed 89 cases of patients who underwent surgery for long bone fracture of tibia or femur. 58 patients had tibia fractures, 31 had femur fractures. A "squat-and-smile" clinical assessment and a radiographic examination of the injured limb were performed by the treating surgeon at 6 weeks and 6 months after the implantation of an interlocking nail. A standardized questionnaire and a dedicated photo camera were used for the "squat-and-smile" test, whose results were compared to the degree of fracture healing evidenced by the radiologic examination.

Results: Of the 89 examined cases, 71 patients who reached a satisfactory squatting position at the 6-month follow-up showed complete bone healing on the radiographs. Only 5 patients who were unable to comfortably reach a full squatting position at 6 months had a satisfactory bone healing at the radiologic evaluation. Vice versa, of the 13 patients who did not have a satisfactory bone healing at 6-month radiograph, only 2 had a good “squat-and-smile”.

Conclusion: A standardized "squat-and-smile" test at 6 months after surgery for long bone fractures of the lower extremities can be used for follow-up assessments in hardship areas. Patients who can satisfactorily perform the test would not need an additional radiographic evaluation to confirm complete bone healing. Patients who fail to pass the "squat-and-smile" test should be encouraged to access the nearest facility with radiograph availability for further management. "Squat-and-smile" assessment is an excellent indicator of the bone-muscle cross-talk in the healing process and a reliable easy performing test to evaluate the postoperative quality of life of a trauma patient. New strategies must be developed to overcome the big challenge of low follow-up rates in postoperative patients from hardship areas.