

RETROSPECTIVE EVALUATION OF THE RUST AND MRUST SCORES IN A COHORT OF WITH A KNOWN FRACTURE STIFFNESS

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Introduction

A cohort of 69 patients managed with a propriety external fixation device was used to assess the efficacy of the radiographic union score for tibias (RUST) and the modified radiographic score for tibias (mRUST) in identifying union in unstable tibial fractures. RUST and mRUST assess union based on the degree of callus formation in each of the four cortices of a broken bone. RUST scores from 4-12, mRUST scores from 4-16. The values stated to equate to union in the literature are 9/12 (RUST) and 12/16 (mRUST) ⁽¹⁾.

Materials and methods

Plain radiographs of 69 patients managed with the IOS external fixation device were scored pre-operatively and at the point of fixator removal using RUST and mRUST. At the point of fixator removal, fractures were known to have a stiffness of 15 Nm/Degrees in two orthogonal planes and were therefore deemed to have achieved union; 15 Nm/degrees is an accepted measure of union ⁽²⁾. The scores of RUST and mRUST for fractures pre-operatively and at the point of fixator removal were evaluated to assess the efficacy of the scoring systems.

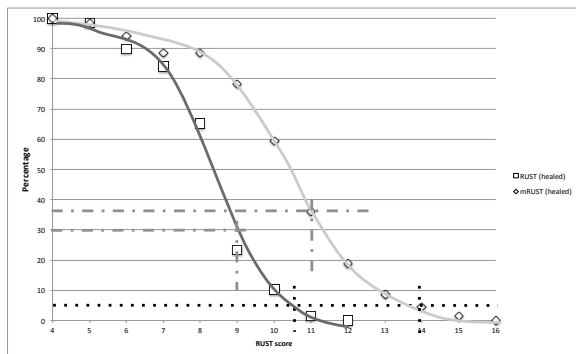


Fig 1 – Percentage of population diagnosed as “healed” using RUST and mRUST scores

Results

RUST and mRUST consistently scored 4 for fresh fractures indicating that the fracture was not healed. Healed fractures demonstrated a wide range of scores. RUST, range 4-11, S.D. 1.41, mean

score 7.8. mRUST, range 4-14, S.D. 2.18 mean score 9.9. The mean values of RUST and mRUST at union were significantly different to those stated in the literature ($p < 0.001$) ⁽¹⁾.

Discussion

The wide range of RUST and mRUST scores for healed fractures leaves uncertainty as to what score is a true indication of union. The score cannot be too low, otherwise there is a risk of premature removal of the external fixator; it cannot be too high as fixators would be left on too long, increasing patient morbidity. The literature suggests a score of RUST (9) and mRUST (12) indicate union ⁽¹⁾. If we were to use these scores to guide removal 5% (RUST) and 5% (mRUST) would have fixators removed too early; 75% (RUST) and 60% (mRUST) would have fixators left on too long.

Conclusion

RUST and mRUST produce a range of scores too broad to accurately predict union. We cannot recommend it as a means of predicting union. Our findings are in line with the literature; callus appearance on radiographs is a poor method of assessing fracture union ^(2,3).

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