Do thoraco-lumbar spinal injuries classification systems exhibit lower inter- and intra-observer agreement than other fractures classifications?: A comparison using fractures of the trochanteric area of the proximal femur as contrast model

Urrutia, J.; Zamora, T.; Klaber, I.; Carmona, M.; Palma, J.; Campos, M.; Yurac, R.

Abstract

Introduction

It has been postulated that the complex patterns of spinal injuries have prevented adequate agreement using thoraco-lumbar spinal injuries (TLSI) classifications; however, limb fracture classifications have also shown variable agreements. This study compared agreement using two TLSI classifications with agreement using two classifications of fractures of the trochanteric area of the proximal femur (FTAPF).

Material and methods

Six evaluators classified the radiographs and computed tomography scans of 70 patients with acute TLSI using the Denis and the new AO Spine thoraco-lumbar injury classifications. Additionally, six evaluators classified the radiographs of 70 patients with FTAPF using the Tronzo and the AO schemes. Six weeks later, all cases were presented in a random sequence for repeat assessment. The Kappa coefficient (κ) was used to determine agreement.

Results

Inter-observer agreement: For TLSI, using the AOSpine classification, the mean κ was 0.62 (0.57–0.66) considering fracture types, and 0.55 (0.52–0.57) considering sub-types; using the Denis classification, κ was 0.62 (0.59–0.65). For FTAPF, with the AO scheme, the mean κ was 0.58 (0.54–0.63) considering fracture types and 0.31 (0.28–0.33) considering sub-types; for the Tronzo classification, κ was 0.54 (0.50–0.57). Intra-observer agreement: For TLSI, using the AOSpine scheme, the mean κ was 0.77 (0.72–0.83) considering fracture types, and 0.71 (0.67–0.76) considering sub-types; for the Denis classification, κ was 0.76 (0.71–0.81). For FTAPF, with the AO scheme, the mean κ was 0.75 (0.69–0.81) considering fracture types and 0.45 (0.39–0.51) considering sub-types; for the Tronzo classification, κ was 0.64 (0.58–0.70).

Conclusion

Using the main types of AO classifications, inter- and intra-observer agreement of TLSI were comparable to agreement evaluating FTAPF; including sub-types, inter- and intra-observer agreement evaluating TLSI were significantly better than assessing FTAPF. Inter- and intra-observer agreements using the Denis classification were also significantly better than agreement using the Tronzo scheme.

Keywords Agreement study, Fracture classification, Hip fracture, Spine fracture, Thoraco-lumbar, Trochanteric area fracture