Intraobserver and interobserver agreement of Gilula arches in the diagnosis of perilunate dislocations

A. García-Jiménez¹, À. Grau², L. Noguera², S. Castañeda¹, B. Uran³, J. Ochoa³, I. Proubasta², I. Gich³, J. Martínez²


Introduction
Perilunate dislocation is a severe and disabling injury that requires urgent reduction and stabilization to prevent late complications such as vascular necrosis, chronic instability and arthritis. Acute perilunate injuries are misdiagnosed and treated conservatively in 25% of cases. The recognition of the three arches or lines of Gilula (Fig. 1) in the PA projection of the wrist X-ray is crucial for a correct diagnosis.

Objectives
The main objective was to evaluate the intraobserver and interobserver reliability of Gilula lines in the diagnosis of perilunate dislocations. We also pretended to know if there were differences between orthopaedic surgery residents, general orthopaedic surgeons and hand surgeons in the diagnosis of perilunate dislocations by observing Gilula lines.

Study design & methods
Six observers evaluated 30 carpal X-rays in the PA projection (15 with a diagnosed perilunate dislocations and 15 without carpal injuries) (Fig. 2). There were 2 orthopaedic surgery residents, 2 general orthopaedic surgeons and 2 hand surgeons. All of them had to classify the X-rays as pathological or normal attending only to Gilula lines. A statistical calculation of the interobserver and intraobserver variability was performed using the Kappa coefficient.

Results
The intraobserver agreement was very good (Kappa 0.867 – 1.000) in residents and in hand surgeons, and moderate or good (Kappa 0.553 – 0.795) in general orthopaedic surgeons. The interobserver agreement was very good among hand surgeons (Kappa 0.875) while it was good among general orthopaedic surgeons (Kappa 0.875) and residents (Kappa 0.751).

The interobserver agreement was greater between residents and hand surgeons (Kappa 0.875, which means a very good agreement) and between general orthopaedics and hand surgeons (Kappa 0.813, which means a very good agreement) than between residents and general orthopaedic surgeons (Kappa 0.702, which means a good agreement).

Conclusions
The observation of Gilula lines is a good diagnostic method in case of suspicion of perilunate dislocation, with good intraobserver and interobserver agreement in orthopaedic residents, general orthopaedic surgeons and hand surgeons.