

1 ***Abstract***

2 Rupture of the extensor pollicis longus (EPL) tendon is a known complication after  
3 undisplaced distal radius fracture (DRF). However, no report has revealed the  
4 relationship between EPL tendon rupture and the fracture pattern. Thus, this study  
5 aimed to investigate the characteristics of fractures at risk of EPL tendon rupture using  
6 fracture line mapping of undisplaced DRFs. This study used computed tomography  
7 imaging data of undisplaced DRFs with (n=18) and without EPL tendon rupture (n =  
8 52). Fracture lines obtained from 3D reconstruction data were drawn manually after  
9 matching with a 2D template wrist model. Fracture maps represented the fracture line  
10 distribution by superimposing the fracture lines of all 70 patients. Heat maps showed  
11 the relative frequency of the fracture lines as a gradual color change. Fracture lines of  
12 cases with EPL tendon rupture were concentrated in the proximal border of Lister's  
13 tubercle. By contrast, fracture lines of cases without EPL tendon rupture were relatively  
14 dispersed.