The purpose of this study is the discrimination of 28 postmenopausal with osteoporotic femoral fractures from an age-matched control group of 28 women using texture analysis based on fractals. Two pre-processing approaches are applied on radiographic images; these techniques are compared to highlight the choice of the pre-processing method. Furthermore, the values of the fractal dimension are compared to those of the fractal signature in terms of the classification of the two populations. In a second analysis, the BMD measure at proximal femur was compared to the fractal analysis, the latter, which is a non-invasive technique, allowed a better discrimination; the results confirm that the fractal analysis of texture on calcaneus radiographs is able to discriminate osteoporotic patients with femoral fracture from controls. This discrimination was efficient compared to that obtained by BMD alone. It was also present in comparing subgroups with overlapping values of BMD