AbstractID: 9494 Title: Osteolytic Metastases Quantification from Digitized Radiographs

Purpose:
To assess a gray level parameter in order to characterize osteolytic metastases and to compare with healthy bone on digitized radiographs.

Materials and Methods:
The authors previously developed a computerized method in order to characterize healthy bone on digitized radiographs. We obtained an optimized healthy bone classification to compare with pathological bone: cortical, trabecular and flat bone. In the present study, 144 healthy bone and 45 osteolytic metastases radiographs corresponding to 189 different patients of both sexes were digitized (size of 0.175-mm pixel and 4,096 gray levels). Osteolytic metastases were classified in non flat bone (OL1, n = 15) and flat bone (OL2, n = 30). The radiological images were processed using a lowpass filter and analyzed calculating gray level histograms on digitized radiographs. The parameter calculated was: mean gray level (MGL: 0 - 4096).

Results:
The results indicate that there are significant differences in mean values ($p<0.001$) between healthy bone and osteolytic metastases. The MGL values of osteolytic metastases are: OL1 = 1630 ± 255 and OL2 = 1742 ± 278, and the healthy bone groups: Flat: 3360 ± 301, Cortical: 3440 ± 239 and Trabecular: 2752 ± 223. The values of healthy bone were greater than osteolytic metasases.

Conclusion:
Our results show that the use of MGL quantify healthy bone and osteolytic zones accurately. Assessment of MGL on digitized skeletal radiographs is a reliable method for radiological exploration.

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