

Radiological aspects of maxillary bone morphology in patients with osteoporosis

BACKGROUND

Osteoporosis is a common systemic disease of the skeleton, characterized by low bone mass and disturbances in the microarchitecture of bone tissue, which leads to increased fragility of bones and the risk of fractures [1]. Osteoporosis on the radiologic image is characterized by an increased transparency of bone tissue and other signs, depending on the degree and duration of the dystrophic process [2,3]. To evaluate the morphology of the inferior cortex in panoramic radiographs according to the classification of Klemetti.

KEY-WORDS

maxillary bone, osteoporosis, radiological examination

AIM OF THE STUDY

Evaluation of radiological image of maxillary bone morphology in patients with osteoporosis.

MATERIAL AND METHODS

Study of a group of 32 patients with osteoporosis treated in the "Omni Dent" dental clinic. The age of the patients - from 18 to 71 years. Evaluation of radiographic indices of osteopenia/osteoporosis according to Klemetti, based on radiological examination on OPG and CT 3D correlated with DEXA. The information from OPG and CT 3D was processed on the available equipment software (Sirona Sidexis 4.0) (figure 1 and figure 2). Were analyzed the following radiological aspects of maxillary bone: the appearance of glomerular picture where it was not; thinning of the cortical layer; expansion of the medullar space; spongiosis of the cortical layer; emphasized contours of the bone in severe osteoporosis.

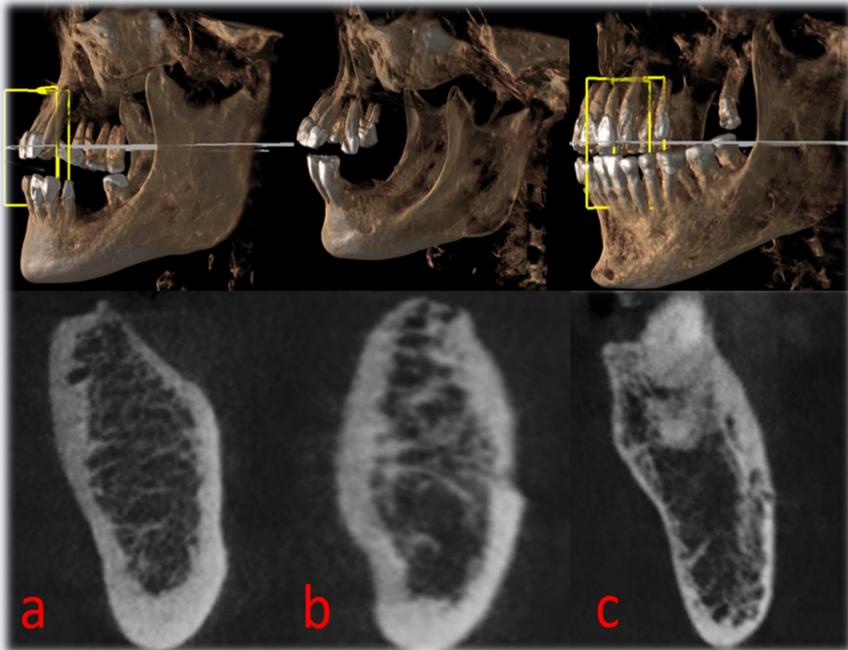


Fig. 1. Radiographic classification of bone density on CBCT in correlation with DXA: a- normal bone density; b- osteopenia; c- osteoporosis.



Fig. 2. Scheme of radiographic classification of osteoporosis on OPG according to Klemetti:

C1 (patient O. E., 59 y.o.); C2 (Patient N.L., 57 y.o.); 3 (patient M.N., 70 y.o.).

RESULTS

Patients were divided into 3 study groups by age: group I (35-44); group II (45-54); group III (≥ 55 years of age) (figure 3). We have observed a dependence between the age group and the radiological changes of the bone microarchitecture (figure 4). This phenomenon is confirmed by a strong direct correlation between the age and the degree of osteoporosis ($r_{xy} = 0.676$, $p < 0.001$). By comparing the OPG data with the osteodensitometric data we determined that the Klemetti method has a rate of 82.5 % statistical accuracy.

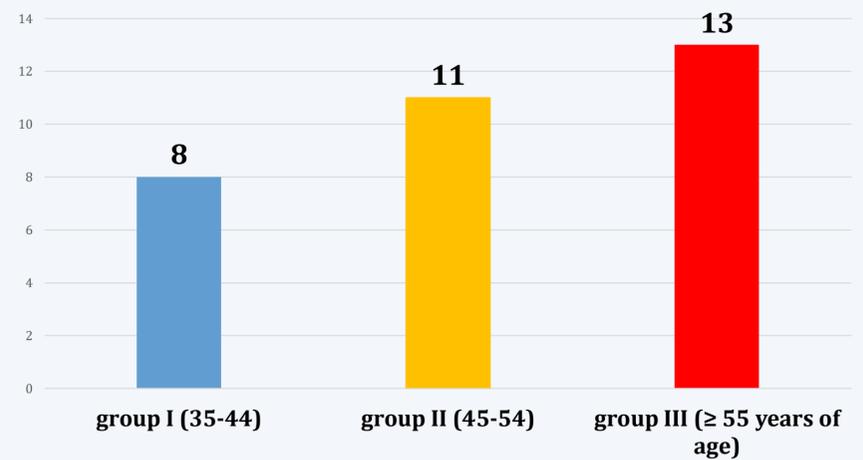


Fig. 3. Patients division

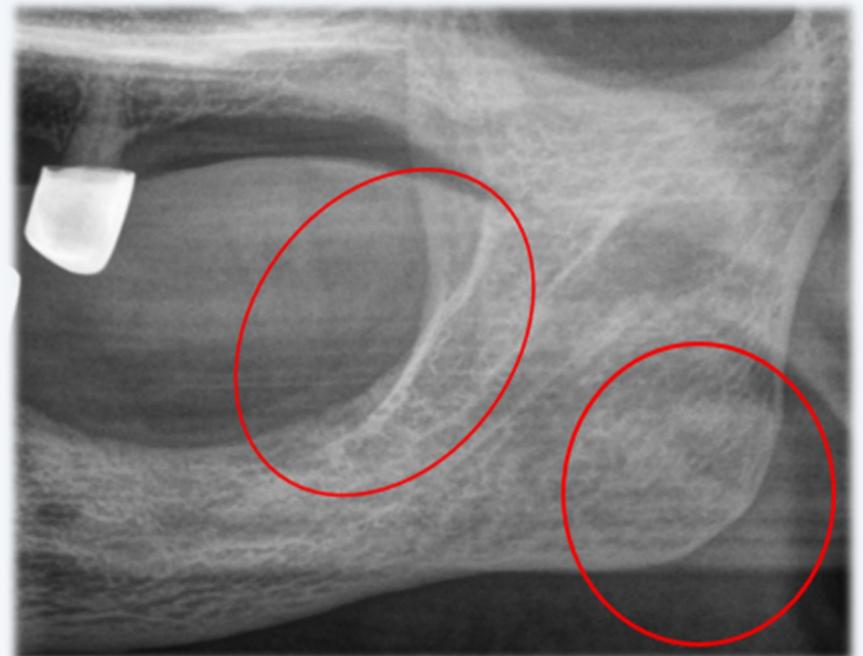


Fig. 4. Radiological changes of the bone microarchitecture

CONCLUSION

The examination using the DEXA, OPG and CT 3D allows establishing an accurate, clear and correct diagnosis, as well as choosing a safe treatment plan acceptable in each clinical case. The obtained result allows us to consider the Klemetti classification as a sufficient method for early diagnosis of suspected osteopenia/osteoporosis, and the obtained information can be used in subsequent prosthetic implant rehabilitation planning.

REFERENCES

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