

BONE MICROARCHITECTURE IN MILD PRIMARY HYPERPARATHYROIDISM

L. Dalle Carbonare¹, P. Ballanti², F. Bertoldo¹, M.T. Valenti¹, A. Fracalossi¹,
Z. Carandante¹, S. Giannini³, V. Lo Cascio¹

¹ Department of Biomedical and Surgical Sciences, Internal Medicine "D", University of Verona, Verona, Italy

² Department of Experimental Medicine and Pathology, Section of Pathology, La Sapienza" University, Rome, Italy

³ Department of Medical and Surgical Sciences, Clinica Medica I, University of Padova, Italy

Primary hyperparathyroidism (PHPT) is a common endocrine disease and the high levels of parathyroid hormone cause demineralization of bone and increased risk of fracture. On the other hand, the effect of PHPT on bone structure is more ambiguous.

Aim of this study was to evaluate the effect of PHPT on cancellous bone volume, structure and microarchitecture in the Italian population.

Twelve transiliac biopsy specimens taken in untreated postmenopausal women aged 67 ± 2 years with primary hyperparathyroidism were compared with 14 biopsies taken in normal women aged 71 ± 1 years. None of the patients presented any other disorder affecting bone metabolism.

In these samples we evaluated the direct and indirect histomorphometric parameters of bone microarchitecture using an image analysis system consisting of an epifluorescent microscope (Leica DMR) connected to an analogic 3 CCD camera (Sony DXC 390P) and a computer equipped with a specific software for histomorphometric analyses. Preliminary results on the first 3 samples of each group showed no significant differences between PHPT patients and controls in cancellous bone volume, trabecular thickness and number. Connectivity parameters were higher in PHPT patients than in controls. The results of structural analysis are reported in the table.

	PHPT	Controls	P
Total Skeletonized Length (μm)	13834 \pm 2129	8844 \pm 313	<0.05
Node Number/Tissue Volume ($\#/ \text{mm}^2$)	4.22 \pm 1.39	2.02 \pm 0.20	-0.05
Node to Node Length/Total Skeletonized Length (%)	36.99 \pm 6.50	22.63 \pm 3.52	<0.05
Node to termini Number	25.91 \pm 5.83	11.73 \pm 1.61	<0.05
Node/Termini	0.68 \pm 0.13	0.59 \pm 0.16	NS

Indirect parameters of microarchitecture (Trabecular Bone Pattern Factor, Marrow Star Volume and Fractal Dimension) were similar in the two groups.

In conclusion, preliminary histomorphometric data showed that cancellous bone volume is preserved in the PHPT women, and microarchitecture seemed to be better than in normal women.