A-12 : THE STATUS OF MINERALIZATION IN VERTEBRAE OF THE ELDERLY : AN ANALYSIS USING A NEW MICROSCOPIC METHOD

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It has been widely believed that the quality of bone does not change during age related bone loss, the loss being only in quantity.

The histological diagnosis of osteomalacia is usually accomplished by the measurement of the proportion of osteoid covered surfaces in iliac crest biopsies. Such studies may not show the status in the vertebrae which is an important fracture site. Thin histological sections are also inappropriate as vertebrae consist mainly of trabecular bone having a three dimensional arrangement.

A newly invented microscope (Olbrich 4000) with its flexibility, various modes of illumination and increased depth of field allows the analysis of a large volume from the specimen. The present study used this microscope to analyse trabecular bone derived from 16 male and 8 female patients aged from 30 to 89 years.

A modified fluorescent technique was employed for the study. 4mm thick mid-sagittal sections of 4th lumbar vertebral bodies were cleaned using an enzyme detergent (TERG-A-ZYME) and immersed in brilliant sulphaflavine to stain unmineralized bone matrix. Defatted specimens were embedded in polymethyl-methacrylate; polished and examined through a yellow pass filter using ultraviolet illumination.

Three dimensional distribution of unmineralized bone patches (osteoid) could readily be studied using this method. Superficially, some osteoid patches were seen in younger specimens; their presence increased with age. In osteoporotic subjects large patches with healing microfractures were readily identified. This study confirmed the defective quality of bone in elderly patients and the presence of osteomalacia in old age.