Diagnostic Revolution of Microhematuria by Real-Time Confocal Scanning Laser Microscope [Hyodo-Iino-Miyagawa (HIM) Method]

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Dear Sir,

In 1979, Birch and Fairley [1] reported that the morphology of erythrocytes in hematuria differs under the phase contrast microscope between patients with nephritis and those with urological diseases. However, strong doubts were raised about the sensitivity and specificity of phase-contrast microscopy [2]. Shichiri et al. [3] described a new method for detecting abnormal urinary RBC morphology by size distribution curves obtained with automated blood cell analyzers. But only 34% of the patients with urological disease showed nonglomerular findings with this method. Therefore, no simple and objective examination method based on this morphological difference in erythrocytes has been established.

The real-time confocal scanning laser microscope (1LM 01: Lasertec, Yokohama) was specifically developed for the inspection of semiconductors. It gives an excellent three-dimensional image like the scanning electron microscope free from unwanted scattered light (fig. 1,2). Iino et al. [4] recently found a way of being able to use this instrument in order to observe living biological specimens. We started clinical application of this laser microscope to diagnose hematuria in 1990 [5-7]. This laser microscope makes possible simultaneous evaluation of many erythrocytes in every visual field with just one focusing.

The objective of this study was to evaluate the usefulness of the laser microscope for the diagnosis of microhematuria. Characteristics of the test were evaluated in 81 patients with

Fig. 1. Glomerular red blood cells (bar=10 μ m).

Fig. 2. Nonglomerular red blood cells (bar=10 μ m).

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