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A reliable Differentiation of Mucor from Aspergillus in Tissue Sections with Ultraviolet Illumination

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SUMMARY : In tissue, hyphae of mucor are characteristically broad and infrequently septate. However, it may be difficult to distinguish mucor from aspergillus in tissue sections occasionally, because sometimes aspergillus septa are not detected with hematoxylin-eosin (HE), periodic acid Schiff (PAS), and Grocott's methenamine silver (GMS). In a case, aspergillus septa can be seen under ultraviolet light. Specifically, structures of these septum were clear cut differences in the histological finding between mucor and aspergillus with ultraviolet illumination. Therefore, we developed a new procedure for rapid and useful differentiation of mucor from aspergillus.

INTRODUCTION

The diagnostic importance of fluorescence of hematoxylin-eosin stained tissue sections has been evaluated in the field of pathology, that is arteriosclerotic lesions,[6, 7] in cardiac and skeletal muscle pathology,[1, 8] and alpha-1-antitrypsin globules.[3] Several investigators described the direct fluorescent microscopic observation of hematoxylin-eosin stained paraffin-embedded tissue sections from known and suggested fungal infections.[4, 5] Many fungi in routine hematoxylin-eosin stained sections will show fluorescence brightly when viewed under ultraviolet illumination. We propose a new method for ready differentiation of mucor from aspergillus using the fluorescence microscope.

MATERIALS AND METHODS

The specimens studied were derived from autopsy materials obtained at the Ryukyu University Hospital and the Nagasaki University Hospital. Tissues were cut at 4 micron and stained by hematoxylin-eosin. Confirmation of fungal morphology was provided with periodic acid Schiff (PAS), and Grocott's methenamine silver (GMS). Hematoxylin-eosin stained sections were also used for examination using a transmitted light fluorescene microscope (Zeiss, FRG).

RESULTS

Mucor hypae were stained lightly with hematoxylin-eosin, periodic acid Schiff (PAS),

and Grocott's methenamine silver methods. In hematoxylin-eosin stained sections, mucor hypae had generally pale yellow-green outlines with lesser absent fluorescence centrally. Specifically, septa of mucor were different frm aspergillus (Figs. 1 and 2).

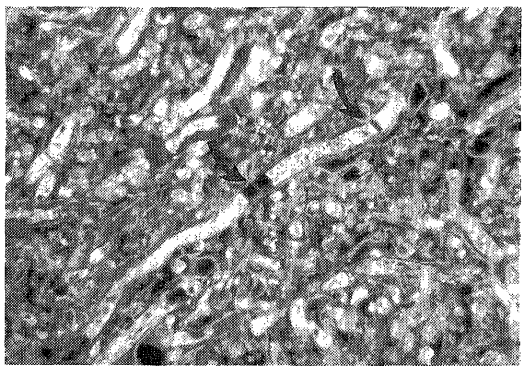

Fig. 1. Mucormycosis. Numerous hyphae have invaded a large blood vessel, causing thrombosis. This is resulting in a massive infact. Rerely septum is observed in the hyphae (arrows), but the most of hyphae are lack of septa. Hematoxylin-eosin staining under ultraviolet illumination (×400).

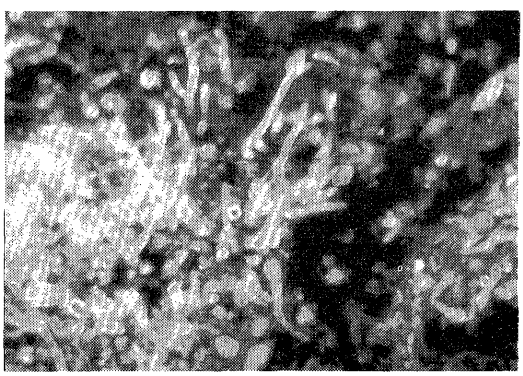

Fig. 2. Aspergillosis. Hyphae of the aspergillus have characteristic dichotomous branching, parallel walls, and numerous septa. These septa structure is clearly different from those of the mucor. Hematoxylin-eosin staining under ultraviolet illumination (×400).

DISCUSSION

At time, it may be difficult to distinguish mucor from aspergillus in tissue sections, especially when the former contain septa and are narrow than usual. Merely observing septa does not rule out the possibility of mucor, because the fungal is not completely aseptate.[2] However, we would like to add our new observation that septa of mucor are different from those of aspergillus when viewed under ultraviolet illumination. Therefore, we propose this new finding for reliable identification of mucor in tissue sections under fluorescence microscope.

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