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IMAGE ANALYSIS

THANITSARA WEACHATENG: TISSUE PRESERVATION OF PLASTINATED BRAIN SLICES: A COMPARISON BETWEEN TWO TYPES OF DEHYDRATION METHODS, LYOPHILIZATION FOLLOWED BY ACETONE AND LYOPHILIZATION ALONE. THESIS ADVISORS: BOONSIRM WITHYACHUMNARNKUL, M.D.,Ph.D., SUKUMAL CHONGTHAMMAKUN, Ph.D., WANTANEE TRAKULRUNGSI, M.Sc., 36 p. ISBN 974-664-810-1

The Conventional method for brain slice plastination has been improved by adding a staining procedure and changing the dehydration method, from acetone dehydration to lyophilization. The improved technique still has some drawbacks; flaking occurs on the brain surface after being plastinated. This study was aimed at the further improvement of the technique, which could eliminate the flaking. The brain slices were plastinated through the standard procedure for S10 plastination. The only difference was in the dehydration process. After fixation and sectioning at 4 mm thick in coronal sections, and at 6 mm thick in horizontal and sagittal sections, the brains were dehydrated through lyophilization for 48 hours, followed by acetone immersion for 8 hours. The specimens were subsequently processed by forced impregnation and curing. The final products were plastinated brain slices, with brownish color of the gray matter and cellular components (nuclei) and whitish of the white matters and neuronal fibers or nerve tracts. The degree of shrinkage was 5% in average, which was less than that of the brains dehydrated by lyophilization only (6% shrinkage). The surface of the brain slices were glistening and smooth, no flaking was observed. Compared to the brain slices that were dehydrated through lyophilization alone, the newly developed brain slices were more flexible and show higher contrast between the gray and white matter. The degree of brightness of the brain surfaces, termed the integrated density, was quantified by computerized software Image Tool. It was found that the plastinated brain slices that were dehydrated through lyophilization and acetone immersion had significantly higher contrast than that of the brains dehydrated by lyophilization alone or those dehydrated by acetone alone and stained with Alston's method.