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A New Fluorescence Imaging Technique For Visualizing Hepatobiliary Structures Using Sodium Fluorescein: Result Of A Preclinical Study In A Rat Model

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Background : This article was published on Surgical Endoscopy. Near-infrared fluorescence imaging has been recently applied in the field of hepatobiliary surgery. Our objective was to apply blue light fluorescence imaging to cholangiography and liver mapping during laparoscopic sur- gery. Therefore, we designed a preclinical study to evaluate the feasibility of using blue light fluorescence for cholangio- graphy and liver mapping in a rat model.

Methods : Sodium fluorescein solution (1 mL to each individual) were administered intravenously to 20 male Sprague–Dawley rats (6 weeks old, 200–250 g), after lapa- rotomy. Whole abdominal organs were observed under blue light (at a wavelength of 440–490 nm) emitted from a com- mercialized LED curing light.

Results : Immediately after the tracer solution was admin- istered into the circulatory system of the rat, it was possible to visualize the location of the kidneys and the bile duct under blue light emitted from the light source.

Conclusions : The liver was vaguely stained green by the tracer, while the ureters were not. After establishing biliary retention via duct clamping in the left lateral segment of the liver, the green color of the segment became distinct by the tracer, which showed vague coloration following release of the clamp.

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