

## The efficacy and safety of a laser thrombolytic system in an animal thrombosis model

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For treating acute cerebral infarction, we developed a laser thrombolytic system with the second harmonic generation of microsecond Nd:YAG laser, and investigated its mechanisms, effectiveness and safety in in vitro and in vivo thrombosis models. Observation of the laser irradiation reaction with a high-speed camera revealed that a bubble was generated in the gelatin phantom. A thrombus in the rabbit carotid artery was induced by an application of ferric chloride. Laser irradiation through an optical fiber against the thrombus resulted in faster recanalization with significance. One day after the recanalization, neurological disorders, cerebral ischemia and cerebral hemorrhage were not observed. No vascular endothelial damage after laser irradiation was observed. An intravascular "real-time" monitoring system is under development to increase the effectiveness and safety during laser irradiation. In the system, the reflection of the monitor light at the tip of the optical fiber-integrated catheter changes depending on the object. So far it has been shown by the monitoring system that the response between blood and thrombus is different.