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Hong Kong brings novel soft robotic system for head & neck cancer surgery

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Through close collaboration between clinicians and engineers, the team developed an MR-safe soft robotic system



A joint research team from The Chinese University of Hong Kong (CUHK) and The University of Hong Kong (HKU) has recently developed a soft robotic manipulator for transoral laser microsurgery on head and neck cancer, guided by intra-operative magnetic resonance (MR) imaging (MRI).

This novel MR-safe system in miniature size, with compliant architecture and five degrees of freedom, enables safe and dexterous laser ablation within the confined spaces of the oral and pharyngeal cavities.

Ex-vivo tissue ablation and a cadaveric head-and-neck trial were carried out under MRI, demonstrating that the system can utilise MR thermometry to precisely monitor the tissue ablation margin and thermal diffusion during the procedure.

For future work, the team is planning to further reduce the robot size. Dr. Ka Wai KWOK, Associate Professor, Department of Mechanical Engineering, Faculty of Engineering at HKU, added, “By miniaturising its size, it will be possible for the robot to access more confined sites such as the nasal cavity and sinus cavity. We will also implement some specific image sequences so that the images can be fed back to the robot in a faster way.”