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IIT Gandhinagar develops hydrogel technology promising safer, minimally invasive surgeries

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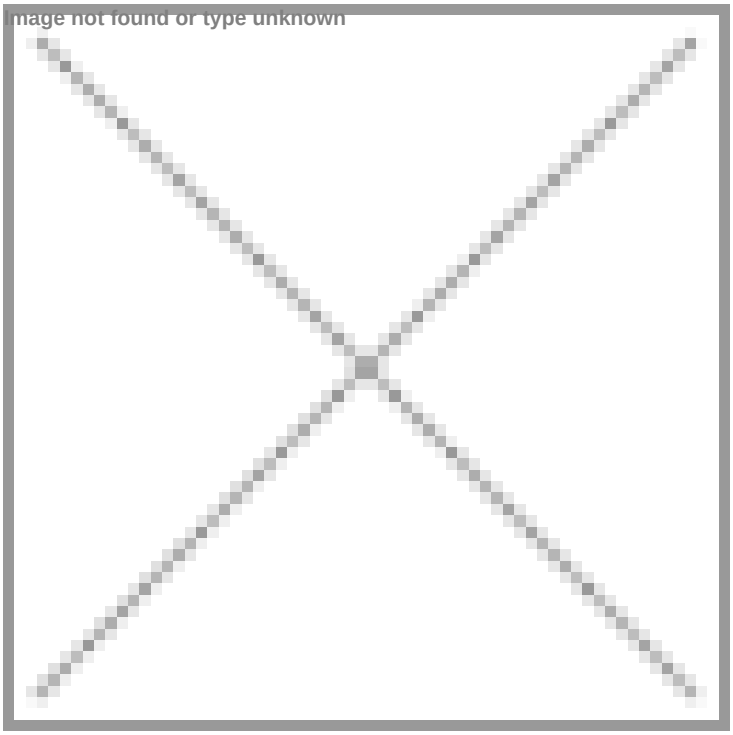

In a significant boost to India's biomedical innovation landscape, researchers at tje Indian Institute of Technology Gandhinagar (IIT-GN) have developed an advanced injectable hydrogel technology with promising clinical applications. It represents a successful translation of laboratory science into patented biomedical technology with real-world potential.

The smart biomaterial can support doctors during minimally invasive procedures, particularly in treating gastrointestinal conditions such as colorectal polyps—abnormal growths that can develop into cancer if not detected and removed early

Current clinical practice involves injecting fluids beneath such polyps to create a cushion for safe removal. However, commonly used solutions like saline are quickly absorbed and often require repeated injections, increasing procedural complexity.

The researchers aim to advance the technology toward clinical translation, including further validation studies and preparation for human trials. With continued development, injectable biomaterials like these could transform how doctors perform

minimally invasive procedures, improve cancer prevention strategies, and enhance recovery for patients worldwide.

Developed using a plant-based molecule called ‘diglycerol monostearate’, the shear-thinning hydrogel can be precisely injected through an endoscopic catheter, forming a durable cushion that enables surgeons to lift and remove polyps more safely. This reduces the risk of tissue damage and bleeding, potentially improving outcomes in minimally invasive gastrointestinal procedures.

Beyond surgical support, the technology opens up broader possibilities in healthcare. The hydrogel platform has demonstrated potential in tissue regeneration and wound healing by creating a protective, moisture-rich environment that supports recovery.