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Wireless endoscopy.

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Abstract

BACKGROUND: Miniaturization of electronic components may allow the construction of new types of endoscopes that no longer require external wires, cables, or optical fibers. Our aim was to assess the feasibility of wireless endoscopy and to construct experimental prototypes using miniature charge-coupled device cameras, light sources, microwave transmitters, and batteries.

METHODS: Feasibility, dimensions of miniature components, and power requirements were assessed. Prototypes were constructed and tested using cameras, transmitters, and halogen lamps powered by small batteries; 10.6 and 0.187 GHz transmitters were used to transmit the video signal.

RESULTS: Moving television images were transmitted through models, post-mortem and live porcine stomachs, to the external receiver. Transmission of images through the abdomen was tested by placing the device in a microwave-impermeable box behind a volunteer's back and the receiver in front of his abdomen. In other experiments the endoscope was used inside the human mouth. The device was placed surgically in the stomachs of 150 kg pigs in vivo and good-quality color television image reception was achieved.

CONCLUSIONS: These experiments demonstrate the feasibility of constructing a new type of endoscope that can transmit moving color television images from the GI tract without requiring fiberoptic or electrical cables.

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