Development of a surgical vision system that uses artificial intelligence to highlight critical anatomy in real time

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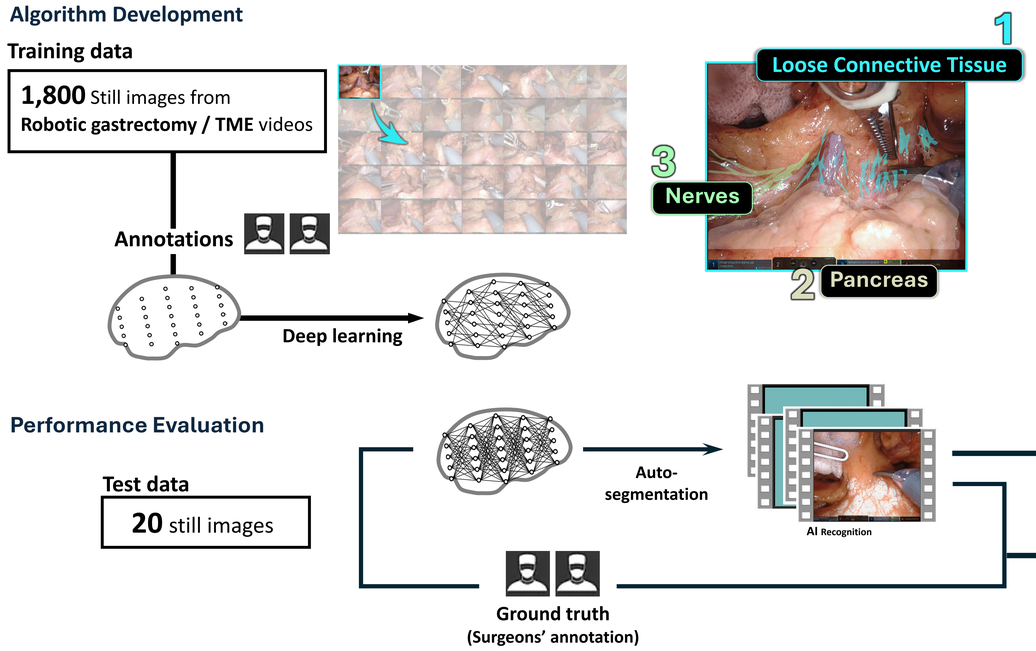
Background

The application of artificial intelligence (AI) technology in medicine is helping to move closer to optimal decision support in diagnostic imaging. Intraoperatively, the largest contributor to surgical complications is misidentification of anatomical landmarks.

Aim

To develop an AI-based surgical vision system that highlights critical anatomy in real time.

Materials and Methods

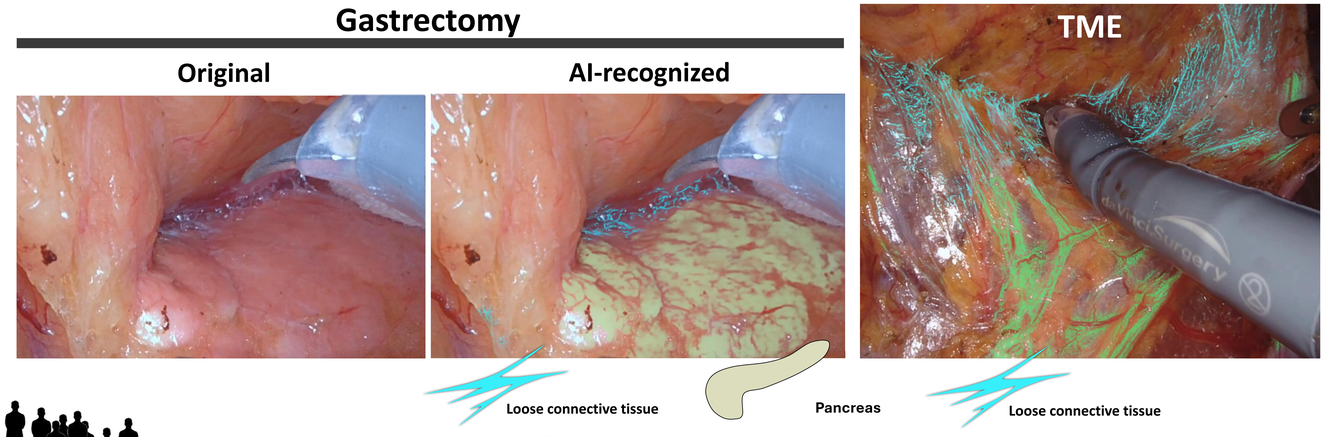


Conclusion

- AI can be trained to identify fine, difficult-to-discern, critical anatomical structures at a level convincing to expert surgeons.
- While surgeons see only the anatomy they can identify, AI displays the true anatomy and can help surgeons differentiate structures they otherwise might not see.
- This technology could assist surgeons in decision making by highlighting important anatomies in real time during gastrointestinal surgery.



Results



	Loose connective tissue	Pancreas	Loose connective tissue
Sensitivity	0.88	0.84	NA
Recall	0.606	0.607	0.40
IoU	0.383	0.461	0.25
Dice	0.549	0.610	0.34

< 0.2 s

Latency in recognizing the objects on average.