

Supplementary Online Content

Kitaguchi D, Takeshita N, Matsuzaki H, Igaki T, Hasegawa H, Ito M. Development and validation of a 3-dimensional convolutional neural network for automatic surgical skill assessment based on spatiotemporal video analysis. *JAMA Netw Open*. 2021;4(8):e2120786. doi:10.1001/jamanetworkopen.2021.20786

eTable 1. Four Categories of Common Criteria (60 Points)

eTable 2. Procedure-Specific Criteria for Sigmoidectomy (2 Points Allotted for Each Item)

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Four Categories of Common Criteria (60 Points)

Category	Points	Criterion
Progress of the operation	16	Speed of the operation Autonomy of the operator Leadership ability Cooperation with assistants
Exposure of the operative field	15	Insertion of ports Keeping the surgical field at the center Display of the target organ Tissue retraction (use of the retractor) Use of the non-dominant hand
Basic laparoscopic surgical skills	19	Appropriate selection of equipment Appropriate handling of tissues Appropriate use of energy devices Correct dissection plane Control of vessels
Suturing and knot-tying	10	Suturing skills Knot-tying skills

eTable 2. Procedure-Specific Criteria for Sigmoidectomy (2 Points Allotted for Each Item)

Category	Criterion
General	1. At the beginning of the surgery, were the intra-abdominal search and the removal of the small bowel and greater omentum performed appropriately? 2. At the end of the surgery, was it confirmed that there was no bleeding from the port removal site, vascular stump, and dissection area, with no foreign body left in the abdominal cavity? 3. Was proper consideration given to cancer surgery (e.g., not touching a tumor)? 4. Was consideration given to avoid intestinal injury? 5. Was the entire surgery structured in a planned manner?
Dissection and mobilization	1. Was clear visualization of the surgical field developed? 2. Were tissue grasping and device manipulation appropriate, with bleeding controlled? 3. Was the procedure appropriate, without any unnecessary extension of time? 4. Were the peritoneal incisional line and method of medial and lateral approach appropriate? 5. Was the dissection layer recognition appropriate to a sufficient extent?
Central lymph node dissection	1. Was clear visualization of the surgical field developed? 2. Were tissue grasping and device manipulation appropriate, with bleeding controlled? 3. Was the procedure appropriate, without any unnecessary extension of time? 4. Was the central lymph node dissection appropriate? 5. Were the vascular recognition and management appropriate?
Rectal transection and anastomosis	1. Was clear visualization of the surgical field developed? 2. Were tissue grasping and device manipulation appropriate, with bleeding controlled? 3. Was the procedure appropriate, without any unnecessary extension of time? 4. Were the rectal dissection and mesorectal transection appropriate? 5. Were the linear and circular stapler usages appropriate?