

Robotic Total Intracorporeal Completion Proctectomy With Restorative IPAA: The NICE Approach

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See Video on DCR YouTube Channel <https://youtu.be/Rv9O0PB6k60>

BACKGROUND

New technologies and techniques in robotic platforms and devices have led to a surge of interest in performing right- and left-sided intracorporeal anastomosis (ICA).¹⁻³ More recently we developed a stepwise approach for left-sided ICA with the added benefit of natural orifice transrectal extraction of specimen called the *NICE procedure*.^{4,5} After completion of more than 200 NICE procedures, we aim to apply robotic intracorporeal, as well as natural, orifice techniques to successfully perform total intracorporeal restorative proctectomy with ileal pouch-anal anastomosis (RP with IPAA).

IMPACT OF INNOVATION

We propose a novel technique to facilitate robotic total intracorporeal RP with IPAA. This affords numerous benefits, including the ability to assemble the pouch intracorporeally

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with real-time assessment of length and reach. The potential for inversion of the limbs or torsion of the mesentery when performed extracorporeally and returned to the abdomen is mitigated. The use of the rectum as a natural orifice allows extraction of specimen, use of stapler through the rectum to form J-pouch, and insertion of the anvil for ICA.

Furthermore, the mucosa of the rectal cuff is visualized for precise assessment and preservation of the transition zone for continence while avoiding excess length. Finally, we close the rectum with a pursestring suture to eliminate the need for stapler use in a narrow or deep pelvis.

TECHNOLOGY MATERIALS AND METHODS

A case video was recorded and stored on an encrypted server for video editing in accordance with institutional review board approval. The da Vinci Xi platform with vessel sealer extend, fenestrated bipolar, and Cadiere forceps (Intuitive Surgical, Sunnyvale, CA) was used, as well as a powered Echelon linear stapler (Ethicon Inc, Bridgewater, NJ), to create the pouch and the powered circular stapler (Ethicon Inc) for the IPAA. Port placement is depicted in Figure 1. The ileostomy is divided, and an additional port is placed at this site. Proctectomy is then performed, and the rectum is divided at the anorectal junction, leaving the lumen open. The specimen is extracted through the rectum, and the limbs of the J-pouch are brought down into the pelvis and aligned with stay sutures. Enterotomy is made at the pouch apex, and the Echelon linear stapler is passed through the open rectum into the small-bowel limbs for the formation of the J-pouch. The anvil is introduced and secured to the J-pouch, and the rectal cuff is closed with a purse string suture to perform the IPAA.

PRELIMINARY RESULTS

In this video, we illustrate the steps of a robotic total intracorporeal RP with IPAA.

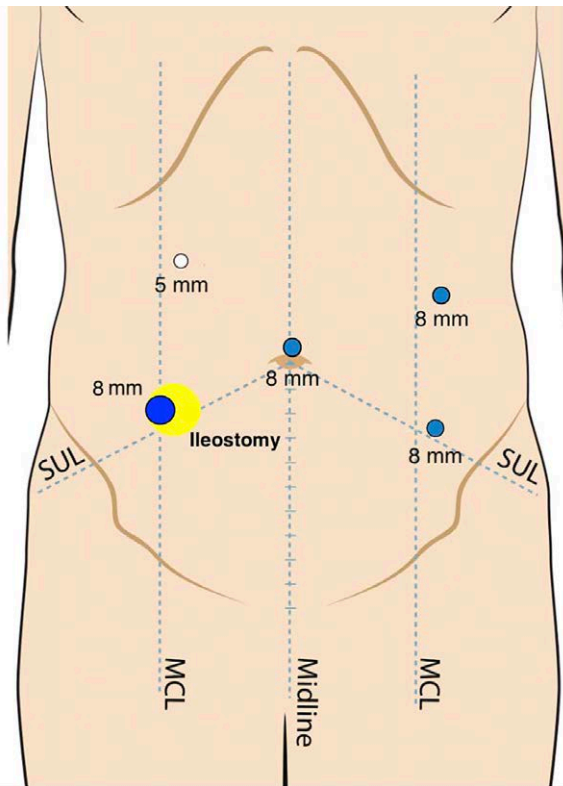


FIGURE 1. Robotic port placement for total intracorporeal completion proctectomy with restorative IPAA. SUL = Spine-umbilical line; MCL = Mid-clavicular line.

CONCLUSIONS

Robotic technology with natural orifice techniques enables successful completion of a total intracorporeal restorative procedure with proctectomy, extraction of specimen, creation of J-pouch, and completion of IPAA.

FUTURE DIRECTIONS

Total intracorporeal surgery can be used for even the most complex procedures in a safe and reproducible fashion. Future advancements in technologies and techniques including robotic platforms with machine learning and artificial intelligence may foster procedure optimization and safe widespread adoption.

KEY WORDS: Colorectal surgery; Ileo pouch-anal anastomosis; Intracorporeal anastomosis; Minimally invasive surgery; Natural orifice specimen extraction; NICE procedure.

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