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VIDEO ARTICLE

Robotic Abdominoperineal Resection

Robotik Abdominoperineal Rezeksiyon

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ABSTRACT

In the surgical treatment of lower rectum and anal canal tumors, minimally invasive robotic abdominoperineal resection can be performed effectively and safely. Deep pelvic dissection can be facilitated by a three-dimensional view, a stable camera, the use of four arms, and the surgeon working in a comfortable position.

Keywords: Anal canal tumor, miles operation, robotic surgery

ÖZ

Alt rektum ve anal kanal tümörlerinin cerrahi tedavisinde minimal invaziv robotik abdominoperineal rezeksiyon etkili ve güvenli bir şekilde yapılabilir. Derin pelvik diseksiyon 3 boyutlu görünüm, sabit kamera, 4 kol kullanımı ve cerrahın rahat bir pozisyonda çalışması ile kolaylaştırılabilir.

Anahtar Kelimeler: Anal kanal tümör, mil operasyonu, robotik cerrahi

Introduction

When sphincters cannot be preserved or clear surgical margins cannot be obtained in cases of distal rectum and anal canal tumors, abdominoperineal resection (APR) is indicated.[1] APR is the excision of the rectum and anus by releasing the rectum with an adequate circumferential resection margin as per the principles of total mesorectal excision (TME). APR can be performed using the traditional open approach as well as minimally invasive methods, which have proven benefits like less pain, shorter hospital stays, and faster recovery of bowel functions.[2] Numerous studies have reported that robotic surgery is both effective and safe.[3,4,5]

Surgical robotic systems outperform traditional laparoscopic instruments with increased device stability, three-dimensional view, and 7-degree endo-wrist movement. The main advantage of the robotic system is that it provides a stable and high-quality image in the deep pelvis, where exposure is extremely difficult and the working area is limited. The full command of the surgeon on this stable platform with four arms enables advancement in a fine and accurate dissection plane in this area. Thus, a deeper plane closer to the skin level can be reached compared to the open and laparoscopic approaches, which reduces blind dissection. It might facilitate deep pelvic dissection, especially in men and patients with obesity.[1]

- Patient position, robotic system setup, trocar placement, and docking: We use the Da Vinci™ Xi™ robotic system. The patient is placed in the Lloyd Davies position. Four 8-mm trocars, with a margin of at least 8 cm between them, are placed on the line, starting from the left subcostal area, passing through the right side of the umbilicus, and extending to the spina iliaca anterior superior. In the lower-right quadrant, a 12-mm assistant trocar is placed for stapler use and assistance. Docking is completed once the robot arms are properly positioned so that they do not overlap.

APR is performed in two sections: abdominal and perineal. After the robotic system setup, port placement, and docking, the abdominal approach begins with the release of mesocolon

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from medial to lateral and inferior. This section contains six important steps.

- Inferior mesenteric artery (IMA) ligation: The IMA can be ligated at its origin from the aorta (high ligation) or after giving the left colic branch (low ligation). If a low ligation is to be performed, the lymph nodes in the IMA root should be dissected.
- Inferior mesenteric vein (IMV) ligation: The IMV is ligated at the lower border of the pancreatic body, near the Treitz ligament.
- Mobilization of mesocolon: After releasing the left colon and sigmoid colon with a medial to lateral approach, the left colon is mobilized from the lateral to include the splenic flexure.
- Protection of the ureter, gonadal vessels, and autonomic nerves: Following IMA ligation, a dissection plane is created from medial to lateral, which preserves the left ureter, gonadal vessels, and autonomic nerve plexus. This dissection plane should be held throughout the procedure, all the way down to the pelvic floor.
- TME: In rectum tumor surgery, TME is the gold standard surgical approach that is currently accepted in open, laparoscopic, and robotic surgery. The avascular presacral plane is usually entered from the posterior and dissected down to the pelvic floor muscles. Then, the dissection is continued laterally and anteriorly to the pelvic floor. At this stage, a digital rectal exam is used to determine whether the dissection margin extends to the distal border of the tumor. In anal canal tumors, the levator ani muscle can be cut to reach the adipose tissue in the ischiorectal space. Thus, the perineal stage can be shortened.

Colostomy: After mobilizing the colon and rectum, the colon is cut with the help of a stapler, and a colostomy is created by exteriorizing the colon to the skin at the left lower quadrant.

Then, in the perineal approach, the skin and subcutaneous tissues are passed through a perianal incision and merged with the dissection plan created in the deep pelvis with the abdominal approach. Through this incision, the distal colon, rectum, and anal canal are removed from the pelvis. Further, the pelvic floor is sutured and closed after a suction drain is placed on it.

Ethics

Informed Consent: Obtained.

Peer-review: Externally peer reviewed.

Authorship Contributions

Surgical and Medical Practices: C.A., M.K., Concept: C.A., Design: S.F., Data Collection or Processing: S.F., T.D., Literature Search: T.D., Writing: C.A., N.A.S.

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Video.

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