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# تحديثات دور المنظار الجراحي في استئصال الأورام السرطانية بالمستقيم

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# Updates of Laparoscopic Management of Rectal Cancer

*Essay*

*Submitted for Partial Fulfillment of the Master Degree in General Surgery*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿ قَالُوا سُبْحَانَكَ ۖ عَمَّا كُنَّا إِذَا مَا  
هَلَمْنَا بِكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ ﴾

[البقرة:32]

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## Abbreviations

|              |                                                 |
|--------------|-------------------------------------------------|
| <b>APR</b>   | Abdominoperineal resection                      |
| <b>CARP</b>  | Conventional abdominoperineal resection         |
| <b>CBD</b>   | Common bile duct                                |
| <b>CO2</b>   | Carbon dioxide                                  |
| <b>Hg</b>    | Mercury                                         |
| <b>IL-2</b>  | Interlukin 2                                    |
| <b>LAPR</b>  | Laparoscopic abdominoperineal resection         |
| <b>LAR</b>   | Laparoscopic anterior resection                 |
| <b>LTME</b>  | Laparoscopic total mesorectal excision          |
| <b>NOTES</b> | Natural orifice transluminal endoscopic surgery |
| <b>OAPR</b>  | Open abdominoperineal resection                 |
| <b>OAR</b>   | Open anterior resection                         |
| <b>OTME</b>  | Open total mesorectal excision                  |
| <b>RCT</b>   | Randomized controlled trials                    |
| <b>TME</b>   | Total mesorectal excision                       |
| <b>TNF</b>   | Tumor necrosis factor                           |
| <b>USA</b>   | United states of America                        |
| <b>VS</b>    | Versus                                          |

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## **Aim of the work**

This work aimed to discuss recent clinical trials concerned with the role of laparoscopic resection of rectal cancer including laparoscopic total mesorectal excision, laparoscopic rectal resection with anal sphincter preservation of rectal cancer and laparoscopic abdomino-perineal resection of rectal cancer.

It also aimed to discuss the oncologic aspect dealing with laparoscopic rectal resection and to compare between laparoscopic and open rectal resection in rectal cancer.

## **Introduction**

The last decade has seen a dramatic change in the management of rectal cancer. This has been delivered through more thorough and informed preoperative assessment, wide spread use of multimodal treatments including neoadjuvant therapy, and the introduction of minimally invasive procedures and improvement in rectal cancer surgery (*Cunningham and Lindsey, 2011*).

Two revolutions in rectal surgery occurred during the past 20 years. The first was the introduction of total mesorectal excision (TME) in 1982, The second was the application of minimal invasive surgery for the treatment of rectal malignancies in the early 1990s (*Dulucq et al., 2012*).

Minimally invasive surgery offers several important advantages to the cancer patients needing surgery: less bleeding, less trauma, less risk of incisional hernias, wound adhesions postoperative infection and quicker, less painful recovery. Even for patients with large abdominal and pelvic tumors, laparoscopic surgery may be still appropriate and superior to open surgery (*Wernsing, 2012*).

One of the most controversial issues in minimally invasive surgery has been the implantation of laparoscopic technique for the curative resection of rectal malignancies initial concerns included the potential violation of oncologic principles the effect of carbon dioxide and the phenomenon of port site tumor recurrence. The long term survival after laparoscopy for rectal cancer is still unclear, especially for advanced rectal cancer requiring extended lymphadenectomy (*Kitano et al., 2010*).

Although many studies have shown the benefits of laparoscopy for colonic cancer, only few studies have reported the advantages of laparoscopy for rectal cancer (*Leung et al., 2011; Leroy et al., 2011*).

## **Laparoscopic Anatomy of Rectum**

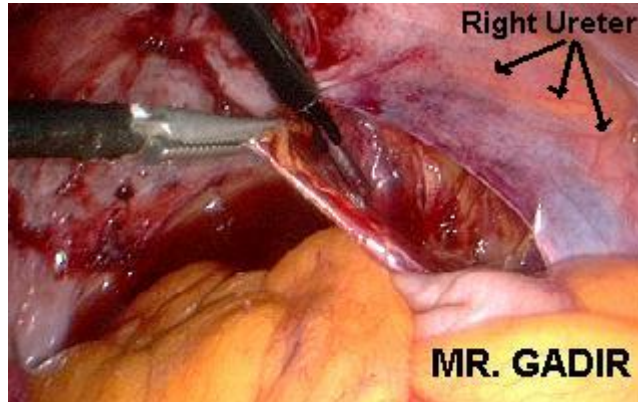
Anatomy is the cornerstone of any surgical operation. A thorough knowledge of the anatomic features of laparoscopic rectal surgery can reduce operative mistakes and complications (*Chengyu et al., 2006*).

Identifying the ureter is the first important step in laparoscopic rectal surgery. We conventionally expose the left ureter. First, the white filmy adhesion between the lateral leaf of the mesosigmoid and the peritoneum in the left iliac gutter is snipped. Then, the lower loosely connective tissue is further dissected. The testicular (ovarian) vessel passes lateral to the ureter. The left ureter is often near the root part of the mesosigmoid. The left and right ureters go across the end of the common iliac artery and the origin of lateral iliac artery, respectively, at the pelvic entrance. Its peristalsis can be seen while the ureter is poked by dissecting forceps (*Bretagnol et al., 2003*).



*Fig. 1. The left ureter lies lateral to the ovarian vessel above the pelvic entrance (Chengyu et al., 2006).*

After entering the pelvis, it first descends along the lateral wall and then turns anteromedially at the level of the sciatic thorn. In the male, the ureter reaches the fundus of the bladder posteroinferior to the deferent duct. In the female, the ureter runs anteriomedially in the base of the broad ligament, crossing the uterine artery beneath the artery 2 cm lateral to the uterine cervix and then reaches the bladder wall. Because the right ureter is more lateral, it does not need to be exposed. In most circumstances, the right ureter can be seen going down at the pelvic entrance through the peritoneum, especially in non obese patients (*Leroy et al., 2011*).



*Fig. 2. The right ureter can be seen through the peritoneum  
(Gadir, 2004).*

The inferior mesenteric artery originates from the anterior wall of the lower part of the aorta at approximately the level of L3, 3 or 4 cm below the aortic bifurcation, and then running in a lower left direction. It divides into the left colic artery superiolateral, the sigmoid artery lateral, and superior rectal artery downward. When the assistant or the left hand of the operator elevates the upper part of the mesosigmoid using the grasper in the left superior direction, the inferior mesenteric artery will be drawn straight. Then, the pedicle of the inferior mesenteric artery can be generally seen. The root of the inferior mesenteric artery can easily be dissected at the base of the pedicle and then cut (*Senagore et al., 2003*).