



The circumferential resection margins status: A comparison of robotic, laparoscopic and open total mesorectal excision for mid and low rectal cancer

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Abstract

Introduction: Minimally invasive surgery for rectal cancer (RC) is now widely performed via the laparoscopic approach, but robotic-assisted surgery may overcome some limitations of laparoscopy in RC treatment. We compared the rate of positive circumferential margins between robotic, laparoscopic and open total mesorectal excision (TME) for RC in our institution.

Methods: Mid and low rectal adenocarcinoma patients consecutively submitted to robotic surgery were compared to laparoscopic and open approach. From our prospective database, 59 patients underwent robotic-assisted rectal surgery from 2012 to 2015 (RTME group) were compared to our historical control group comprising 200 open TME (OTME group) and 41 laparoscopic TME (LTME group) approaches from July 2008 to February 2012. Primary endpoint was to compare the rate of involved circumferential resection margins (CRM) and the mean CRM between the three groups. Secondary endpoint was to compare the mean number of resected lymph nodes between the three groups.

Results: CRM involvement was demonstrated in 20 patients (15.5%) in OTME, 4 (16%) in LTME and 9 (16.4%) in the RTME ($p = 0.988$). The mean CRM in OTME, LTME and RTME were respectively 0.6 cm (0–2.7), 0.7 cm (0–2.0) and 0.6 cm (0–2.0) ($p = 0.960$). Overall mean LN harvest was 14 (0–56); 16 (0–52) in OTME, 13 (1–56) in LTME and 10 (0–45) in RTME ($p = 0.156$).

Conclusion: Our results suggest that robotic TME has the same oncological short-term results when compared to the open and laparoscopic technique, and it could be safely offered for the treatment of mid and low rectal cancer.

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Keywords: Rectal cancer; Robotic surgery; Minimally invasive surgery; Total mesorectal excision; Circumferential resection margins

Introduction

Minimally invasive surgery for rectal cancer is now widely performed via the laparoscopic approach and has been validated in randomized controlled trials compared to open surgery.^{1,2} However, there are several technical drawbacks to laparoscopic surgery, including limited range of motion of instruments in narrow pelvic cavity, 2-

dimensional view, need for a skilled assistant and unstable camera view.³ Technical advantages of the robotic-assisted surgery compared to laparoscopic surgery in rectal surgery includes improved 3-dimensional vision, enhanced ergonomics, tremor elimination, superior dexterity, surgeon's comfort^{4,5} and potentially better oncological and functional outcomes.

For successful treatment of rectal cancer, the quality of the surgical technique is critical and affects both local recurrence and overall survival. The most important technical factor is to assure the integrity of the mesorectal fascia during total mesorectal excision (TME). The pathologic features of the resected specimen most widely investigated

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