# AUTONOMIC NERVE PLEXUS PRESERVATION WITH BETTER QUALITY OF LIFE IN LAPAROSCOPIC RECTAL SURGERY

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# Result

The rate of urinary bladder dysfunction was 0.0% in the laparoscopic group and 74.0% in the open surgery group. The laparoscopic group had a significantly lower rate of urinary bladder dysfunction by 74.00% (95%CI: -86.16, -61.84), with statistical significance (p-value <0.001).

The rate of sexual dysfunction was 0.0% in the laparoscopic group and 56.0% in the open surgery group. The laparoscopic group had a significantly lower rate of sexual dysfunction by 56.00% (95%CI: -69.76, -42.24), with statistical significance (p-value <0.001)

# Background

Rectal cancer represents a significant healthcare challenge globally. Radical surgery is currently the standard treatment and is necessary in most cases. Due to the complexity of pelvic organs and structures, this operation can sometimes lead to complications that may deteriorate patients' quality of life postoperatively.

The incidences of urinary bladder and sexual dysfunction have been reported, following radical pelvic surgery.The laparoscopic surgery is not only less invasive but also provides superior operative vision, allowing for the preservation of pelvic autonomic nervous plexus.

# Objective

The primary outcome of this study is the comparison of the incidences of urinary bladder dysfunction between the laparoscopic autonomic nerve plexus preservation technique and the open surgical approach.

The secondary outcomes include the incidences of sexual dysfunction, disease-free survival, length of hospital stay, and the need for blood transfusions both perioperatively and postoperatively between the two approaches.

# Materials and method

In this study, we included 101 patients with rectal cancer who underwent either laparoscopic or open rectal surgery from October 2017 to July 2024, with a six-year surveillance period utilizing computed tomography scans and colonoscopy in accordance with NCCN guidelines.

Urogenital function outcomes were collected through perioperative and postoperative records, as well as telephone questionnaires with consent. The assessment tools used included the International Prostate Symptom Score (I-PSS), the International Index of Erectile Function (IIEF), and the International Index of Female Sexual Function (IFSF).

**Table 1** Demographic and clinical characteristics of patients

| Characteristics | Laparoscopic (n = 51) | Open (n = 50) | p-value |
|---|---|---|---|
| Age (years) | 67.33 ± 11.33 | 70.32 ± 12.44 | 0.210 |
| Sex | | | |
| Male | 16 (31.4) | 24 (48.0) | 0.088 |
| Female | 35 (68.6) | 26 (52.0) | |
| Tumor size (cm) | 4.73 ± 1.22 | 5.40 ± 1.56 | 0.017 |
| Distant from AV (cm) | 8.53 ± 3.82 | 9.44 ± 5.00 | 0.306 |
| Stage | | | |
| pT I | 9 (17.6) | 1 (2.0) | 0.003 |
| pT II | 16 (31.4) | 7 (14.0) | |
| pT III | 26 (51.0) | 38 (76.0) | |
| pT IV | 0 (0.0) | 4 (8.0) | |
| Type of operation | | | |
| Anterior resection | 8 (15.7) | 12 (24.0) | 0.008 |
| Low anterior resection | 40 (78.4) | 32 (64.0) | |
| Ultralow-anterior resection | 3 (5.9) | 0 (0.0) | |
| APR | 0 (0.0) | 6 (12.0) | |
| Operation time (hour) | 4.06 ± 0.31 | 3.56 ± 0.58 | <0.001 |
| Pre operative chemo-RT | 38 (74.5) | 32 (64.0) | 0.252 |
| Post operative chemotherapy | 47 (92.2) | 48 (96.0) | 0.678 |
| Post operative radiation | 1 (2.0) | 1 (2.0) | 1.000 |

**Table 2** Comparison of outcomes between laparoscopic resection versus open resection.

| Outcomes | Laparoscopic (n = 51) | Open (n = 50) | Absolute difference (95% CI) | p-value |
|---|---|---|---|---|
| Length of hospital stay (day) | 6 (5 - 6) | 8 (7 - 9) | -2.00 (-2.71, -1.29)§ | <0.001 |
| Perioperative blood transfusion | 0 (0.0) | 29 (58.0) | -58.00 (-71.68, -44.32)‡ | <0.001 |
| Postoperative pain scale | 4.65 ± 0.59 | 8.10 ± 1.27 | -3.45 (-3.84, -3.07)† | <0.001 |
| Local recurrence | 0 (0.0) | 9 (18.0) | -18.00 (-28.65, -7.35)‡ | 0.001 |
| Urinary bladder dysfunction | 0 (0.0) | 37 (74.0) | -74.00 (-86.16, -61.84)‡ | <0.001 |
| Sexual dysfunction | 0 (0.0) | 28 (56.0) | -56.00 (-69.76, -42.24)‡ | <0.001 |

Data are presented as number (%), mean ± standard deviation or median (interquartile range).

†Absolute difference is the mean difference with 95%CI.

§Absolute difference is the median difference with 95%CI.

‡Absolute difference is the risk difference with 95%CI.

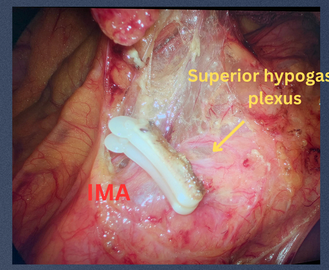
**Table 3** Comparison of survival rate between laparoscopic resection versus open resection.

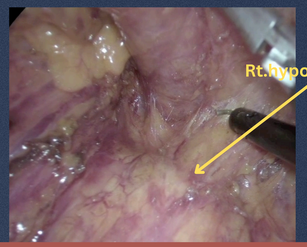
| Time | Event (Dead) | Survival rate (95%CI) |
|---|---|---|
| All patients | | |
| 1 year | 3 | 97.00 (90.98 - 99.02) |
| 3 years | 4 | 92.58 (85.05 - 96.40) |
| 5 years | 4 | 86.27 (76.18 - 92.30) |
| Laparoscopic (n = 51) | | |
| 1 year | 0 | 100.00 NA |
| 3 years | 0 | 100.00 NA |
| 5 years | 0 | 100.00 NA |
| Open (n = 50) | | |
| 1 year | 3 | 93.87 (82.16 - 97.98) |
| 3 years | 4 | 84.93 (70.91 - 92.53) |
| 5 years | 4 | 70.53 (51.81 - 83.08) |

# Conclusion

Regardless the radical rectal surgery, the laparoscopic approach with autonomic nerve plexus preservation provides the preservation of urinary bladder and sexual function post operatively and in long-term period.

# Procedure




**100% disease free survival within 6 years surveillance colonoscopy**

