



A RETROSPECTIVE STUDY OF THE ETIOLOGY FOR LAPAROSCOPIC RIGHT HEMICOLECTOMY IN A TERTIARY CARE CENTRE FOR A PERIOD OF FIVE YEARS.

General Surgery

Dr. Samir S Deolekar

Addl Professor and Unit Chief in the Department of General Surgery, Seth GSMC and KEM Hospital Mumbai

Dr. Sanaah FS Raja

Senior Resident in the Department of General Surgery, Seth GSMC and KEM Hospital Mumbai

ABSTRACT

Laparoscopic colorectal surgeries have changed the outlook to morbid diseases such as colon cancer. In the West right sided colon resections are done mainly for neoplasms. However, in our country where tuberculosis is endemic, right sided colon resections are done for intestinal obstruction due to Koch's Abdomen. Being the most frequently afflicted site in intestinal tuberculosis, the ileo-caecal-ascending colon region develops strictures and masses, leading to sub-acute intestinal obstruction which obviates surgery. Our study has demonstrated that in a zone endemic for tuberculosis, majority of laparoscopic right hemicolectomy surgeries are done for the same, as opposed to neoplastic growth.

KEYWORDS

laparoscopic right hemicolectomy, colon cancer, abdominal tuberculosis, right colon resection

INTRODUCTION

- Laparoscopic colorectal surgery is well established as a safe and feasible procedure to treat benign and malignant pathologies.
- The use of laparoscopy in colon surgery quickly evolved since its introduction in the 1990's from an experimental, infrequently performed approach to the current standard of care. A laparoscopic approach to right colon resection can be performed for a variety of benign and malignant conditions including ileocecal - colonic resection for Abdominal Kochs, Crohn's and colon neoplasia. With careful patient selection and precise operative technique, this approach improves patient recovery using smaller incisions with resulting decrease in patient discomfort and potential shorter hospital stay. (1)
- Here, we studied in depth the role of a laparoscopic right hemicolectomy, analyzing the indications for this surgical procedure and the factors related to the conversion from laparoscopy to open surgery.
- The main indications for laparoscopic right colectomy are benign (Abdominal Kochs, inflammatory bowel disease, and rare right colonic diverticulitis) and malignant diseases (right colon cancer and appendiceal neuroendocrine neoplasm): we described the good outcomes of laparoscopic right colectomy in all these illnesses.
- Laparoscopic conversion rates in right colectomy are reported as 21.5%; we described the different type of risk factors related to open conversion: patient-related, disease-related and surgeon-related factors, procedural factors and intra- operative complications.
- We conclude that laparoscopic right colectomy is considered superior to open surgery in the short- term outcomes without much difference in long-term outcomes.
- There are multiple points of preference for a laparoscopic colectomy over a traditional open colectomy. Smaller incision size leads to improved cosmesis and reduced post operative pain.
- The laparoscopic approach is also associated with less postoperative ileus and earlier diet tolerance. These factors contribute to earlier recovery of the patient with a reduced hospital stay and earlier return to normal activity.

Aims and Objectives

1. To study the etiology for laparoscopic right hemicolectomy in a tertiary care Centre during a period of 5 years that is from December 2017 to December 2022.
2. To analyze the rate of conversion to open surgery
3. The indications for the conversion to open surgery and the proportion of each.
4. To understand the proportion of cases of Abdominal Kochs and malignancies who have respectively undergone a right hemicolectomy.

Methodology

Study Type: Retrospective Observational Study

Study Duration: General Surgery Department of KEMH, Mumbai

Study Duration: December 2017 to December 2022

Sample Size: 135

Inclusion Criteria

- Age more than 13 years
- Patients who have undergone a laparoscopic right hemicolectomy with intra or extracorporeal anastomosis.

Exclusion Criteria

Patients with incomplete data/ data unavailable.

Sample Size Estimation

The most common etiology for right hemicolectomy in Indian setup is tuberculosis. Assuming around 50% of cases were due to TB, with 95% confidence interval and 8.5% absolute error, we found minimum sample size to be 132.

The following simple formula would be used for calculating the adequate sample size in prevalence study;

$$n = Z^2 P(1 - P) / d^2$$

Where n is the sample size

Z is the statistic corresponding to level of confidence

P is concordance rate

d is absolute error

$$n = Z^2 P(1 - P) / d^2$$

$$= 1.96 * 1.96 * 0.50 (1 - 0.50) / 0.085^2 * 0.085$$

$$= 3.8416 * 0.2500 / 0.007225$$

$$= 0.9604 / 0.007225$$

$$= 132$$

Details of Statistical Analysis

Qualitative data was represented in form of frequency and percentage. Nominal data among qualitative variables included data like diagnosis, gender, conversion to open surgery.

Results were graphically represented where deemed necessary.

Appropriate statistical software including but not restricted to Excel, SPSS version 1.0.1 (the name has no official acronymic expansion) were used for statistical analysis. Graphical representation was done in Excel package included in Microsoft Office.

Association between qualitative variables was assessed by Chi-Square test with Continuity Correction for all 2 X 2 tables and by Fisher's exact test for all 2 X 2 tables where p value of Chi-Square test was not valid due to small counts. In presence of small counts, in tables with more than two rows and/or columns, adjacent row and/or Column data was pooled and Chi-Square Test reapplied with Continuity Correction for all 2 X 2 tables. Fisher's exact test was applied for all 2 X 2 tables where p-value of Chi-Square test was not valid due to small counts, in spite of pooling of data.

RESULTS

1. Distribution of participants by age: There was a distribution of

- participants across all age groups, ranging from 13 years to 83 years. The largest proportion of participants were in the age groups of 21 to 30 and 31 to 40 years.
- Distribution by Sex: There was a similar distribution among males and females in this study, with a slightly higher proportion of males (52.6%) as compared to females (47.4%).
 - Distribution by diagnosis: The most common diagnosis seen among participants requiring laparoscopic colectomy was abdominal Kochs, with more than half the participants (53.3%) suffering from this condition. This was followed by a right colon carcinoma in 25.9% of participants.
 - Majority of the participants underwent laparoscopic colectomy, but 21.5% required conversion to open surgery.
 - There was conversion to open surgery in 29.2% of cases with abdominal Kochs. All cases of amoebic colitis were managed laparoscopically, but out of the 3 cases of fulminant amoebic colitis 66.7% required conversion to open surgery. All cases of appendicular mass were managed laparoscopically. Among the 4 cases with caecal fistula, 50.0% required conversion to open surgery. Among cases with Crohn's disease, iatrogenic perforation during colonoscopy and diverticulitis, 100.0% were successfully operated laparoscopically. Out of the 35 cases with right colon carcinoma, 88.6% were done laparoscopically while 4 (11.4%) required conversion to open surgery.
 - Among the cases of abdominal Kochs with stricture found on laparoscopy, 25.5% required conversion to open surgery. There was no statistically significant association found between strictures and conversion to open surgery. (P-value = 0.285)
 - Among the cases of abdominal Kochs with adhesions found on laparoscopy, 66.7% required conversion to open surgery. There was a statistically significant association found between adhesions and conversion to open surgery. (P-value = 3.29E-04)

CONCLUSION

- Of all the patients who underwent a laparoscopic right hemicolectomy, a slight male dominance was seen.
- The age groups of 21 - 40 years dominated the distribution fitting into the age distribution for Abdominal Kochs.
- The was a huge difference was in the etiology for a right hemicolectomy in our study with Abdominal Kochs having a proportion of 53.3% (72 cases) as compared to right colon cancer which had a proportion of 25.9% (35 cases).
- A major differentiating point as compared to Western studies where right colectomies are usually done for colon cancer.
- This is a marker of the burden of Abdominal tuberculosis in the Indian tertiary care setup, where most elective laparoscopic right colectomies are due to obstructive lesions of the ileocaecal - ascending colon region.
- As per the study by Singh et al, the main clinical presentations which led to surgery for Abdominal Kochs included abdominal pain of one month duration (35%), sub acute intestinal obstruction (24%), generalised complaints like loss of appetite and significant loss of weight (51%), fever (13%) and lower gastrointestinal tract bleeding (2%).
- A palpable abdominal lump was noted in 20 % of patients, 28.6% present with overt peritonitis due to intestinal perforations, ascites was present in 2.8%, and most exhibited clinical signs like pallor, generalized lymphadenopathy, cachexia, and pedal oedema.
- This corroborated with the intraoperative findings of intestinal perforations, cocoon abdomen, single and multiple small bowel and ascending colon strictures, mass lesions in the ileocecal region, mesenteric lymphadenopathy with formation of a lymph nodal mass with calcification, ulcerations in the distal ileum and caecum, and formation of a tough membrane around small bowel loops leading to the formation of an abdominal cocoon.
- A statistically significant 29.2 % conversion rate to open surgery was observed in cases of Abdominal Kochs - this is in tune with the surgical dilemma of adhesive and structuring lesions in cases of Kochs Abdomen.
- A significant statistical association was seen between adhesions due to abdominal Kochs and conversion to open surgery with 66.7% of cases Abdominal Kochs with adhesions being converted to open surgery.
- 11.4% of patients operated for right colon cancer required conversion to open surgery.
- This is in tune with the literature on conversion of laparoscopic colorectal procedures, especially the study by Pandya et al, which demonstrated that intraabdominal pathology like phlegmon and

adhesions, extent and invasion of the tumour or mass, obesity and unfavourable body habitus were responsible for 48.9% of conversions to a laparotomy.

- This was closely followed by technical problems (31.9%) like hypercarbia, unclear anatomy, stapler misfire, and operative complications (19.1%) like bleeding, cystostomy, and inadvertent enterotomy.
- Lastly, our study reemphasized the endemicity of tuberculosis in India, where a significant proportion of elective right hemicolectomies are due to Abdominal Kochs as illustrated above.

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