

## Routine laparoscopy in male patients with right lower quadrant pain: a single centre experience.

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**Abstract: Background:** Right lower quadrant pain is a common problem in surgical practice. Early diagnosis and treatment avoid unnecessary morbidity and mortality as many of them require surgical intervention. Laparoscopy is the standard recommendation in females of reproductive age group which is both diagnostic and therapeutic. There is no standard recommendation for routine laparoscopy in males who present with acute right lower quadrant pain.

**Aim of the study:** to evaluate the effectiveness of laparoscopy in male patients who present with acute right lower quadrant pain.

**Patients and methods:** We performed a retrospective study in 146 male patients who had undergone laparoscopy for right lower abdominal pain over a period of three years. All the patients underwent laparoscopy within 48 hours of admission. We evaluated preoperative information, laparoscopic diagnosis, post-operative complications and outcome.

**Results:** Total 164 patients were included in the study. 129[88.35%] had features of acute appendicitis of which 15 patients had complicated appendicitis. 14 patients [9.59%] had normally looking appendix and no obvious other pathology was identified. Only 3 patients [2.05%] had alternate diagnosis. 143 patients [97.95%] were successfully managed laparoscopically. There was no mortality or major complications in the study group.

**Conclusion:** Diagnostic laparoscopy an effective tool in accurate diagnosis and treatment of right lower quadrant pain in males with excellent results.

**Keywords:** Right lower quadrant pain, appendicitis, routine laparoscopy, male patient.

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### I. Introduction

Right lower quadrant pain is a common surgical emergency. It is also one of the commonest indications for emergency surgical intervention in both males and females. Accurate preoperative diagnosis is seldom possible in all the patients with right lower quadrant pain even after clinical, laboratory and radiological evaluation. The rate of alternate diagnosis on laparoscopy for suspected appendicitis can be up to 41 %<sup>1</sup>. Laparoscopy gives accurate diagnosis and avoids unnecessary laparotomies and related morbidity<sup>2, 3, 4, 5, 6, 7</sup>. Sensitivity, specificity, and accuracy of laparoscopy for acute appendicitis is extremely good<sup>7, 8</sup>. Diagnostic laparoscopy is the standard recommendation in females with acute abdomen who present with right iliac fossa pain and its role is well established in clinical practice<sup>9, 10</sup>. Laparoscopy is also the recommended procedure in children who present with right lower quadrant pain<sup>11, 12</sup>. The role of routine laparoscopy in males is not very clear and not well evaluated. This could be because the diagnostic accuracy of open appendicectomy in males is nearly 100%<sup>13</sup>. This study was conducted to evaluate the effectiveness of laparoscopy in males who presented with lower quadrant pain.

### II. Aims And Objectives

To evaluate the effectiveness and outcome of laparoscopy in male patients who present with acute right lower quadrant pain.

### III. Patients and methods

Study was conducted in one of the three teaching hospitals of Kasturba Medical College Mangalore, under Manipal University. Medical records of all the male patients above the age of 12 years, who underwent laparoscopy for right lower quadrant pain from January 2011- December 2013, were analyzed. Preoperative clinical findings, investigations, findings on laparoscopy, complications, histopathology reports and outcome were analyzed. All the patients had complete blood counts, urine routine examination, serum amylase, random blood sugar and abdominal ultrasound as a part of routine evaluation. CT scans were not done. Patients were selected for surgery based on findings on clinical examination done by trainee as well consultant. Informed consent was taken for all the patients including consent for conversion to open procedure. Our preference is to perform laparoscopy in all the patients with right iliac fossa pain after initial evaluation. All procedures were done by a team trained in laparoscopic surgery.

#### Laparoscopic procedure:

Diagnostic laparoscopy was performed under general anesthesia. All the patients were made to empty the urinary bladder just before shifting to operating room; nasogastric tube and urinary catheters were not used. Antibiotics were started preoperatively in all the cases and continued for 48 hours to 5 days depending on operative findings. Laparoscopic access was made by open technique by inserting a 10-mm trocar just above umbilicus. Initial exploration was done using a 10mm 30 degree telescope [Karl Storz, Germany] and further trocars were inserted depending on the pathology identified and surgeon's choice. Most common trocar positions used were two 5mm trocars in supra pubic and left iliac fossa. 10mm trocars were used in left iliac fossa in selected cases. Right side and foot end of the patient was elevated during appendicectomy. Appendicectomy was done when the appendix look inflamed, showed adhesions, and appendix looking normal but no obvious other causes were identified. Mesoappendix was divided with Harmonic scalpel ace [Ethicon Endo-surgery] in 131 cases and bipolar coagulation in 12 cases. Stump of the appendix was secured with two catgut endoloops [Ethicon Endo-surgery] in all the cases. Local saline irrigation and suction was done only in cases where there was purulent fluid, spillage of blood or pus. Appendix was removed through 10 mm port through the reducer or with the port to avoid direct contact with the wound. Retrieval bags were used only in gangrenous and perforated appendix. Drains were used in selected cases only and were removed after 24 – 48 hours. Orals were allowed after 6 to 12 hours following surgery. Majority of patients were discharged on 2nd post op day, and few were discharged on the 1st post-operative day. Wounds were left open after 24 -48 hours. All the appendicectomy specimens were sent for histopathological examinations. No further imaging or investigations were done for asymptomatic patients in the post-operative period. Follow ups were done after 1 week and 1 month. Complications were defined as bleeding, iatrogenic injury, post- operative bowel obstruction, leak, intrabdominal abscesses and wound infections.

### IV. Results

Total of 146 male patients were included in the study. Mean age was 28.29 [Range 12-64years]. Majority of the patients [89%] of patients were below 39 years, and nearly half of them belonged to the age group 20-29[43.83%]. Age distributions of the patients are shown in the graph [Fig.1].

#### IV.1 Preoperative evaluation

Right lower quadrant tenderness was present in all the patients on clinical examination. None of the patients had clinically palpable mass. 36 patients [24.66%] had rebound tenderness/ signs of local peritonitis. No patients had hemodynamic instability or features of diffused peritonitis in the study group. White cell count was in normal range [4000-11000/mm<sup>3</sup>] in 42.47 %. Elevated counts were seen in 57.63 %. All the patients had ultrasound examination. Appendix was visualized only in 114 patients [78.08 %] and was reported as inflamed in all. Probe tenderness in right iliac fossa was noted in all the cases [100%]. Minimal free fluid was present in RIF in 11 cases [7.53%].

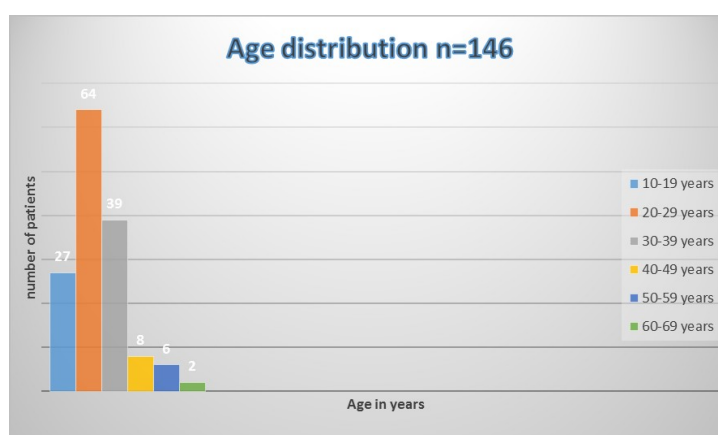


Figure. 1. Age distribution

#### IV.2. Laparoscopic findings

Laparoscopic features of acute appendicitis were identified in 129[88.36%] patients and 14 patients [9.59%] had normally looking appendix [Fig. 2]. Three patients [2.05%] had alternate pathology identified [Fig. 3]. Various pathologies identified on laparoscopy are shown in Table. 1. Two patients [one patient with duodenal ulcer perforation and another patient with appendicitis which could not be mobilized laparoscopically] were converted to open procedure. One patient with appendicular mass was left with a drain, who later

underwent elective open appendectomy. Remaining 143 patients [97.95%] were managed laparoscopically. Laparoscopic appendectomy was done in 143 patients [97.95%] including the two patients with alternate diagnosis. Drains were placed in 16 patients [all complicated appendix and where there was spillage and bleeding]. Mean operating time was 37.09 minutes [20 – 105 minutes]. Out of the 144 appendectomy specimens 110 showed features of acute appendicitis including 8 gangrenous appendicitis with 4 perforations. 23 Number of specimens showed lymphoid hyperplasia. 11 specimens showed fibrosis and narrowed lumen. None of the appendix was reported as normal.

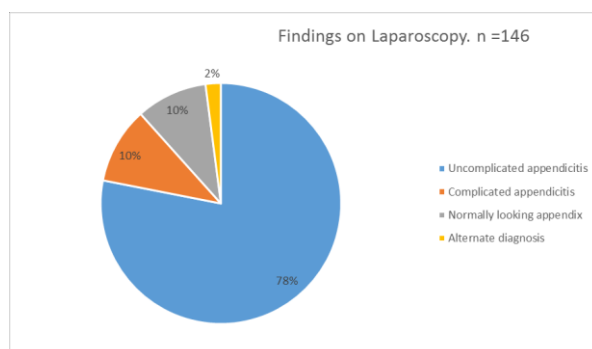


Figure. 2 Laparoscopic findings

Acute appendicitis		Normally looking appendix		Alternate pathology	
Free perforation	3	Adhesions	4	DU perforation	1
Local perforation	2	No adhesions	10	Omental torsion	1
Gangrenous	8			Band obstruction	1
Mass	2				
Adhesions	18				
Uncomplicated	114				
Total	129	Total	14	Total	3

Table.1 Various pathologies on laparoscopy.



Figure.3 Alternate pathologies

#### IV.3. Complications and Outcome

Mean hospital stay was 2.67days [Range. 2 - 7 days]. All the patients who had undergone laparoscopic appendectomy were discharged within 1-2 days of surgery. No major intraoperative complications were noted in the study. There were total 22 [15.07%] complications in the post-operative period. Commonest post-operative complication was minimal bleeding/soakage from supra pubic port which constituted almost half of the complications. None of them required any treatment other than change of dressing. Table.2 describes various complications noted in the study. No intra-abdominal collections were detected in our study.

Complications	Number	Percentage
Port site oozing	11	7.53%
Urinary retention	6	4.11%
Wound infection	3	2.05%
Omental herniation	1	0.69%
Diarrhea	1	0.69%
Total	22	15.07%

Table 2. Post-operative complications

#### IV.4. Follow up

All the patients had follow up visit during the first week for removal of staples. Only 68 patients [46.57%] had follow up after 1 week. One patient had infection in the umbilical port site and diarrhea after 1st week which settled with symptomatic treatment. Clinical and radiological evaluation did not show any intra-abdominal collection.

## **V. Discussion**

The role of laparoscopy in diagnosis and treatment of acute as well chronic abdominal pain is well established in literature<sup>2, 3, 4, 5, 6</sup>. Accurate diagnosis and successful treatment is possible by laparoscopy in majority of abdominal emergencies with better outcome<sup>4, 15</sup>. Laparoscopy is most useful in young women due to the diverse differential diagnosis and it is the standard of care in all the centers worldwide<sup>7</sup>. Early diagnostic laparoscopy also reduces unnecessary exposure to radiation especially in young women<sup>7</sup>. In a Cochrane database systematic review of 12 studies in females of reproductive age group involving 1020 participants, authors found that Laparoscopy was associated with an increased rate of specific diagnoses, significant difference favoring the laparoscopic procedure in the rate of removal of normal appendix, but no evidence suggested a difference in rates of adverse events<sup>10</sup>. Various studies have shown usefulness of laparoscopy in diagnosis and treatment of abdominal pain in children also<sup>11, 12</sup>.

Even though there are enough evidence to support laparoscopy in females and children, there are no clear guidelines regarding laparoscopy in male patients with right lower quadrant pain. Most of the experts in the field recommend diagnostic laparoscopy in females and majority of them prefer to do laparoscopy in males also<sup>15, 16, 17</sup>. Purpose of our study was to evaluate the usefulness of laparoscopy in males with right lower quadrant pain after initial evaluation by clinical, laboratory and ultrasound. Accurate diagnosis was possible in all the patients in our study, which is consistent with previous studies on laparoscopy<sup>14, 16</sup>. Laparoscopic diagnosis of appendicitis was possible in 129[88.35%] patients and other pathological conditions could be diagnosed/ruled out in the remaining [11.65%]. Only 3 patients [2.05%] in the study group had alternate diagnosis.

Negative appendectomy in our study is zero according to the histopathology reports of appendectomy specimens. It could be due to patient selection, as all the patients had preoperative evaluation including ultrasound, which could rule out obvious other pathologies. Authors feel that lymphoid hyperplasia reported in 23 appendectomy specimens [15.75%], few of them may be normal. Even though there are controversies regarding removal of normal looking appendix, most of the experts recommend removal of appendix in the absence of obvious other pathology<sup>18</sup>. We also follow the same and remove appendix when there are no other cause identified. Removal of appendix is helpful to diagnose mucosal appendicitis, tumours and it will avoid future confusion<sup>19</sup>. It does not add any morbidity in patients who are subjected to laparoscopy in experienced hands.

In our study laparoscopy was beneficial in 100% of patients with right lower quadrant pain as accurate diagnosis is possible in all the patients and is therapeutic in most of the patients [97.95%] which is comparable with the results of previous study by Karamanakos SN et al (diagnosis 98.2% and therapeutic 95.2%)<sup>4</sup>. Alternate diagnosis in the study is very low [2.05%] as compared to higher percentage in the previous studies<sup>1</sup>. This could be due to the fact that our study group contained only male patients, where the alternate diagnosis are less, so also ultrasound had ruled out obvious other pathologies. Even though the number of alternate diagnosis in males are low as in our study, two third of them were potentially life threatening. These conditions probably could have been missed in open approach, and added on to the morbidity and adverse outcome. Further larger studies are required to commend on this subject and recommend laparoscopy as the first line of approach in male patients with right lower quadrant pain. Based on the current evidence this approach is definitely superior because of diagnostic accuracy and therapeutic potential of laparoscopy instead of subjecting to unnecessary radiation.

## **VI. Conclusion**

Based on the current study and available evidence laparoscopy is an effective tool in the diagnosis of right lower quadrant pain in males with good outcome. Accurate diagnosis is possible in 100 % patients in our study 97.95% percent of patients could be managed laparoscopically with excellent results. The incidence of alternate; diagnosis in our study was only 2.05%, but most of them were potentially serious conditions. Further studies are required to make a definite conclusion and recommendation.

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