

An Audit of Emergency Laparoscopic Appendectomy at a Tertiary Care Hospital

MOHAMMAD ADNAN NAZEER, MANSAB ALI, RIZWAN SALEEM, ZAIN NOOR AHMED, KHALIL AHMED

ABSTRACT

Objective: To audit our surgical practice of emergency laparoscopic appendectomy in accordance to the 2005 clinical guidelines formulated by the Royal College of Surgeons in Ireland for acute appendicitis.

Methods: Clinical data was collected for all patients who underwent open and laparoscopic appendectomy for uncomplicated appendicitis between February 2010 to December 2010 at Doctors hospital Lahore by manually searching all operative and pathology records retrospectively.

Results: A total number of 130 patients were analyzed, 65 who had their appendix removed by laparoscopic method and 65 who had open appendectomy. Frequency of wound infection with laparoscopic appendectomy was (2%) as compared to (6%) open appendectomy. Intra abdominal infections were less in laparoscopic appendectomy along with less hospital stay along with early return of bowel functions. Operative time was almost equivalent in both types of surgeries. Post op requirement of analgesia was less in Laparoscopic appendectomy.

Conclusion: Our department emergency appendectomy practices were found to be compliant with the set clinical guidelines of Royal College of surgeons of Ireland. Our audit clearly demonstrates that laparoscopic appendectomy is superior to open method.

Keywords: Appendicitis, laparoscopy, audit

INTRODUCTION

Many international studies have proved the benefits of laparoscopic approach in acute abdomen such as aid in placement of appropriate incision in patients with a generalized acute abdomen, reduced postoperative pain, early discharge from hospital and a quicker return to normal activities^{1,2}. In the last two decades, laparoscopy has proved its extended role for purposes of both diagnosis and therapeutics³. But despite of the above mentioned benefits, a routine use of laparoscopy in acute setting remains debatable due to its increased mean operating times, costs and increased risks of vascular complications⁴.

Audit Standards: The diagnostic laparoscopy clinical guidelines were formulated by the Royal College of Surgeons of Ireland in 2005¹⁵. A brief summary of the guidance and the grade of recommendations are listed as below:

1. With a clinical diagnosis of acute appendicitis, it is reasonable to confirm the diagnosis with laparoscopy and laparoscopic appendectomy is an acceptable approach (**Grade A**)
2. It is recommended that women of child-bearing age suspected of having acute appendicitis be

considered for diagnostic laparoscopy prior to the planned appendectomy. Open appendectomy is acceptable following diagnostic laparoscopy (**Grade B**)

3. It is recommended that the macroscopically normal appendix should be left in situ (**Grade B**).

MATERIALS & METHODS

Clinical data was collected for all patients who underwent open and laparoscopic appendectomy for uncomplicated appendicitis on grounds of high index of clinical suspicion between February 2010 to December 2010 at Doctors hospital Lahore by manually searching all operative and pathology records retrospectively. We collected data of the patients for pre-operative investigations and diagnosis, operative technique employed, grade of operating surgeon, timings of surgery, length of hospital stay and re-admission rates. A high clinical index of diagnosis was determined in all patients who presented to our hospital with typical pain suggestive of acute appendicitis (defined as initial central umbilical pain localizing to right iliac fossa) with a positive ultrasound or computed tomography finding of appendicitis and/or raised C-reactive protein level and leucocytosis^{5,6}.

Post op analgesia requirement: This was calculated as number of injections required to make a

Department of Surgery, Nawaz Sharif Social Security University Hospital, Lahore
Correspondence to Dr. Mohammad Adnan Nazeer

patient comfortable post operatively in hospital and before discharge.

Return of bowel function: This was defined as the passage of flatus and audibility of gut sounds, indicating return of bowel function.

Oral fluids allowance/ NPO off: This defined as allowing of oral fluids to patients post operatively and was calculated in hours.

Wound infection: This is defined as redness, erythema with serosengious discharge from wound 3-4 days after surgery.

Operating techniques: Open appendicectomy was performed using a standard technique with either McBurney's or a Lanz incision; laparoscopic method involved a three port technique. A 10mm umbilical port was inserted via open access to gain pneumoperitoneum and further two 5 mm ports or a 10mm and a 5mm ports were inserted in the suprapubic and left iliac fossa as per the surgeon's choice and assess convenience. Mesoappendix was dissected using a monopolar hook diathermy and the appendix stump was secured with two absorbable braided VICRYL® (Polygalactin 910) endoloops.

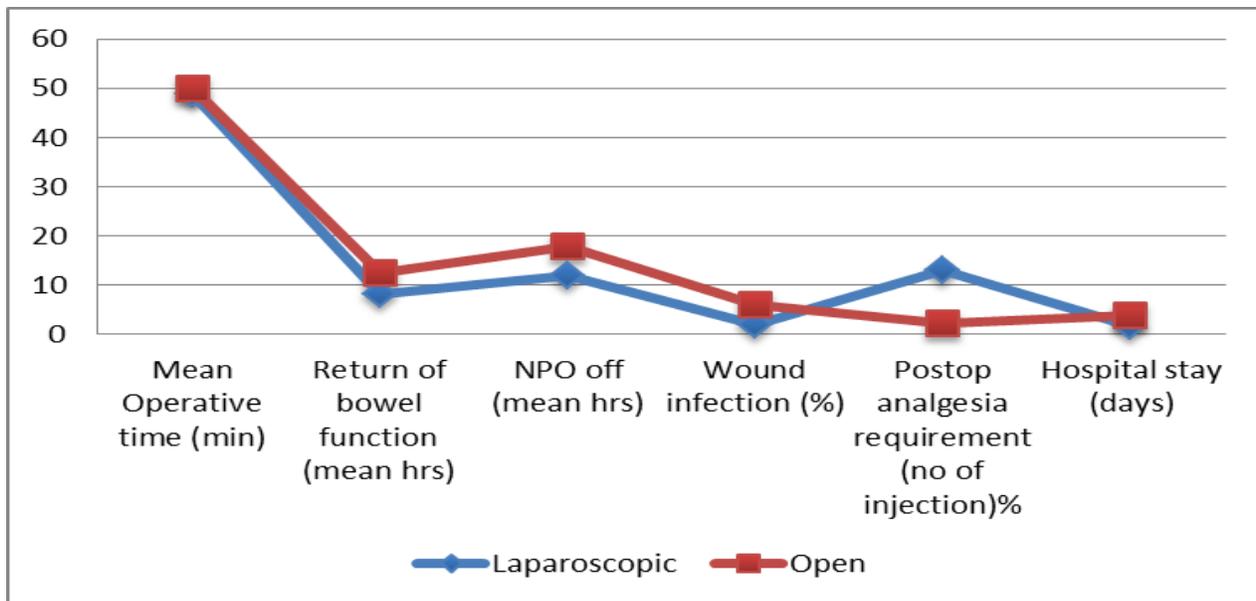
Statistical analysis: The statistical analysis was carried out using SPSS version 17.0. The variables like lengths of stay, operative complications, readmission rates and the operative technique were investigated by means of Chi-square test. A two tailed P value less than 0.05 was taken as statistically significant.

A total number of 130 patients were analyzed, 65 who had their appendix removed by laparoscopic method and 65 who had open appendicectomy. The median patient age recorded was 27 years. Of the total appendectomies, 78% (n=101) of patients had a presenting history of right iliac fossa (RIF) pain for the first time and 22% (n=29) had a recurring history. To minimize the bias, all the operations were performed by consultants themselves (adhering to the Royal College clinical guidance that surgical trainees (ST3 and above) perform appendicectomy). The variables (mean operative time, time mean taken for return of bowel functions, mean time for NPO off, postop. Analgesia requirement and mean hospital stay) studied and compared in both groups. They are given in detail in table 1. There were no technique related operative complications to report from either group. The final histological diagnosis of appendicitis was confirmed in 78 % (n= 51/65) of patients in laparoscopic and 49 % (n=32/65) of patients in the open group.

Table1

Variables	Laparoscopic	Open
Mean Operative time(min)	48.78	49.9
Return of bowel function (mean hrs)	8.20	12.40
NPO off (mean hrs)	12	18
Wound infection (%)	2	6
Postop analgesia requirement (no of injection)%	13	2.3
Hospital stay (days)	1.6	3.9

RESULTS



DISCUSSION

Acute appendicitis is a common surgical emergency. The diagnosis of the condition remains mostly clinical even with the advent of advanced radiological imaging⁷. The gold standard treatment of acute uncomplicated appendicitis is surgical removal of appendix. The appendix can be removed with either open or laparoscopic technique. Traditionally the method used for removing appendix in any individual has been open method world wide. However, many international studies have shown high negative appendectomy rates in the range of 10-33% going as high as 47% for women in reproductive age with the open method^{8,9,10}. Despite of this pitfall, open appendectomy still remains a popular method for early years of surgical training because it carries low risk of morbidity and mortality⁷. Laparoscopic appendectomy was first introduced in 1982 and is now widely accepted and practiced as an alternative method to remove appendix. Since its introduction, laparoscopic appendectomy has significantly decreased the rates of negative appendectomies because it can obtain a prior confirmation of appendicitis before appendectomy⁷. The Royal College of Surgeons of Ireland in their clinical guidelines 2005 recommended the use of laparoscopy as an acceptable approach in the management of acute appendicitis¹⁵. But laparoscopy cannot be used routinely for management of surgical emergencies because of certain factors such as risk of life threatening vascular complications, cost implications and training issues^{11,12}. However, if we fully adhere, to clinical guidelines of the Royal College of Surgeons in Ireland for acute appendicitis, laparoscopy can a useful tool in maximizing trainees' laparoscopic experiences and achieve favorable outcomes for patients. Therefore, through this audit, we wished to determine if our management practices are in accordance to the royal college guidelines on acute appendicitis. The royal college guidance that the laparoscopy procedures should be fully supervised and performed by surgeon in training¹⁵; findings from our audit study showed, surgical trainees (ST-3 and above) performed under adequate supervision. The final histological diagnosis of appendicitis was confirmed in 78% (n=51/65) of patients in laparoscopic and 49% (n=32/65) of patients in the open group This finding was found to be in compliance with certain international studies⁷ which states that use of laparoscopy decreases rates of negative appendectomies.

CONCLUSIONS

Our department emergency appendectomy practices were found to be compliant with the set clinical guidelines of Royal College of surgeons of Ireland. Our audit clearly demonstrates that laparoscopic appendectomy is superior to open method.

Recommendations: This audit was helpful in assessing our clinical practice in the light of a set guidance in this current era of reduced working hours and variable experiences of trainees. Our audit also demonstrated a rising trend towards laparoscopy. Our audit also demonstrated that laparoscopic appendectomy is a better surgical option for acute appendicitis as compared to open appendectomy with less operative time, less hospital stay, early return of bowel functions, less chances of post-operative wound infection and decreased negative appendectomy rates. There was also less need for post op analgesia requirement, thus overall leading to early mobility of patient and return to normal life. Audit also aided in raising the awareness levels of the management protocols amongst emergency staff and in improving theatre staff training and skill mix.

REFERENCES

1. Chung, R.S., et al., A meta-analysis of randomized controlled trials of laparoscopic versus conventional appendectomy. *Am J Surg*, 1999. **177**(3): p. 250-6.
2. Garbutt, J.M., et al., Meta-analysis of randomized controlled trials comparing laparoscopic and open appendectomy. *Surg Laparosc Endosc*, 1999. **9**(1): p. 17-26.
3. Nguyen, N.T., et al., Trends in utilization and outcomes of laparoscopic versus open appendectomy. *Am J Surg*, 2004. **188**(6): p. 813-20.
4. Hermans, B.P. and J.B. Otte, Laparoscopic appendectomy: pros & cons--literature review of 4190 cases. *Acta Chir Belg*, 1997. **97**(3): p. 110-7.
5. Peltola, H., et al., C-reactive protein compared with white blood cell count and erythrocyte sedimentation rate in the diagnosis of acute appendicitis in children. *Acta Chir Scand*, 1986. **152**: p. 55-8.
6. Andersson, R.E., et al., Repeated clinical and laboratory examinations in patients with an equivocal diagnosis of appendicitis. *World J Surg*, 2000. **24**(4): p. 479-85; discussion 485.
7. Al Hilli, Z., et al., Emergency appendectomy in the era of laparoscopy: a one-year audit. *Ir J Med Sci*, 2009. **178**(4): p. 473-7.
8. McGory, M.L., et al., Negative appendectomy rate: influence of CT scans. *Am Surg*, 2005. **71**(10): p. 803-8.

9. Flum, D.R. and T. Koepsell, The clinical and economic correlates of misdiagnosed appendicitis: nationwide analysis. *Arch Surg*, 2002. **137**(7): p. 799-804; discussion 804.
10. Jones, K., et al., Are negative appendectomies still acceptable? *Am J Surg*, 2004. **188**(6): p. 748-54.
11. McCahill, L.E., et al., A clinical outcome and cost analysis of laparoscopic versus open appendectomy. *Am J Surg*, 1996. **171**(5): p. 533-7.
12. Williams, M.D., et al., Laparoscopic appendectomy, is it worth it? *South Med J*, 1994. **87**(6): p. 592-8.
13. Konstantinidis, K.M., et al., A decade of laparoscopic appendectomy: presentation of 1,026 patients with suspected appendicitis treated in a single surgical department. *J Laparoendosc Adv Surg Tech A*, 2008. **18**(2): p. 248-58.
14. Yeh, C.C., et al., Laparoscopic appendectomy for acute appendicitis is more favorable for patients with comorbidities, the elderly, and those with complicated appendicitis: a nationwide population-based study. *Surg Endosc*, 2011. **25**(9): p. 2932-42.
15. Turner, E; Lightwood R. Management of the 'normal' appendix during laparoscopy for right iliac fossa pain. *Diagnostic Laparoscopy Clinical Guidelines (2005)* Royal College of Surgeons in Ireland.