

## EARLY LAPAROSCOPY IN THE MANAGEMENT OF ACUTE NON-SPECIFIC ABDOMINAL PAIN

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**Background:** Emergency admissions make up a large proportion of the overall general surgical workload. The mean hospital stay for patients admitted with non-specific abdominal pain (NSAP) ranges between 4.1 and 6 days using the traditional 'wait and see' management. Incorporation of laparoscopy may improve the management of emergency admissions and also have important cost benefits, by reducing hospital stay and readmission rates. A delay in surgical intervention while further investigations are performed may increase morbidity and prolong hospital stay.

**Aim:** The aim of this study was to assess the usefulness of early laparoscopy in the management of acute NSAP

**Patients & Methods:** This study was done on 43 patients (4M & 39F) who had been admitted with acute abdominal pain of less than 7 days duration and, after examination and baseline investigations had been performed, the diagnosis remained uncertain. Patients had early laparoscopy within 18 hours (median 9 hours, range 2-39 hours) to establish the diagnosis. If the identified pathology was suitable to be treated by laparoscopy, this was done. Otherwise, abdominal incision was placed as seen appropriate by laparoscopy findings. If no pathology was found, the procedure was terminated and the diagnosis of NSAP was made. Postoperative hospital stay, laparoscopy related complication and hospital re-admission were recorded.

**Results:** Nine patients (20.9%) were found to have acute appendicitis on laparoscopy. Seven (16%) had laparoscopic appendectomy the remaining two (4%) had open appendectomy. Twelve patients (27.9%) were found to have gynaecological pathology. One patient (2%) had caecal carcinoma that was treated by right hemicolectomy. One patient (2%) had localised perforation of caecal diverticulitis. He was treated by limited right hemicolectomy. One patient (2%) had Crohn's disease that was treated conservatively. Nineteen patients (44.2%) had normal laparoscopy and they had been diagnosed as 'NSAP'. No patient had negative laparotomy. Median postoperative stay in patients who were diagnosed to have NSAP after laparoscopy was 2 days (range 1-5 days). One patient (2%) had superficial wound infection in the site of umbilical port. One patient (2%) required readmission within 2 days of discharge due to exacerbation of the pain. No further investigations were done. The patient was discharged home after observation for 24 hours.

**Conclusion:** Early laparoscopy is valuable in the management of acute NSAP. It provides a significantly high diagnostic accuracy, permits early patient discharge and minimise the incidence of unnecessary appendectomy & laparotomy. Laparoscopy is particularly useful in the management of acute NSAP in young women of child-bearing age.

**Keywords:** Acute appendicitis – Non specific abdominal pain

### INTRODUCTION

Emergency admissions make up a large proportion of the overall general surgical workload<sup>(1)</sup>. Incorporation of laparoscopy may improve the management of emergency admissions and also have important cost benefits, by

reducing hospital stay and readmission rates.<sup>2</sup> The mean hospital stay for patients admitted with non-specific abdominal pain (NSAP) ranges between 4.1 and 6 days using the traditional 'wait and see' management<sup>(3)</sup> This includes repeated clinical examination, radiological investigation and a gynaecological opinion. A delay in

surgical intervention while further investigations are performed may increase morbidity and prolong hospital stay. The end result may be an unsatisfactory discharge from hospital after a stay of 4-6 days, with a diagnosis of NSAP by exclusion (1).

Relatively young patients, especially females, with non specific abdominal pain (NSAP) constitute a significant proportion of emergency general surgical admissions. Many of these patients have persistent symptoms and are difficult to discharge, undergo multiple, often costly investigations and have repeat admissions. One multicentre study in the UK found that no less than 43% of patients attending hospital with acute abdominal pain had no diagnosis made on discharge (4).

Most patients with NSAP are referred as possible cases of acute appendicitis, frequently with right iliac fossa pain and tenderness. A number of these may erroneously undergo operation for suspected appendicitis and, indeed, in one study, NSAP was eventually diagnosed in 33% of 135 patients undergoing appendicectomy(1). Senior surgeons can achieve clinical diagnostic accuracy rates in appendicitis of over 80%(5). It is unlikely, however, that the senior surgical review can safely reduce the admission rates of patients with non-specific abdominal pain. Conservation of resources can, therefore, only be achieved by reducing the mean hospital stay and thus 'hotel' costs (1).

Although laparoscopy was introduced at the beginning of this century(3), it has, until recently, failed to gain widespread acceptance largely because of the availability of non-invasive imaging techniques (5). A definitive diagnosis is not always possible, however, with non-invasive imaging tests including contrast radiology, computed tomography, magnetic resonance imaging, and ultrasonography(6).

If a definite diagnosis of NSAP could be made earlier and patients discharged, this could reduce costs (1). A normal laparoscopy may allow the surgeon to discharge patients who are still symptomatic, confident that there is no requirement for laparotomy (7). This may also reduce re-admission rates for the same problem. Early laparoscopy may therefore improve the outcome of patients admitted with acute NSAP (8).

The aim of this study was to assess the usefulness of early laparoscopy in the management of acute NSAP.

## PATIENTS AND METHODS

This study was done between February 1999 and February 2003 at Ain Shams University Hospitals, Cairo, Egypt, Southampton University Hospitals and Halton General Hospital, UK. It included forty-three patients.

### *Selection Criteria*

Patients were eligible for the trial if they had been admitted with acute abdominal pain of less than 7 days duration and, after examination and baseline investigations had been performed, the diagnosis remained uncertain.

### *Exclusion Criteria*

All patients who required acute surgical intervention on the basis of the history, clinical examination or routine baseline investigations were excluded even if the exact diagnosis was uncertain.

1. Preoperative Assessment:
2. All patients had the following:
3. Full history and clinical examination.

Baseline investigations: Included a full blood count, measurement of urea, electrolytes and serum amylase, urine culture, a pregnancy test in women of reproductive age. Chest X-ray, plain abdominal radiograph and abdominal ultrasound were done if indicated clinically.

Other investigations as indicated by medical condition and age of the patient e.g. ECG, etc.

### *Anaesthesia:*

All cases were done under general anaesthetic.

### *Laparoscopy:*

Patients had early laparoscopy within 18 hours (median 9 hours, range 2-39 hours). Laparoscopy was performed using an open Hasson's technique for the first 10-mm port placement in the umbilical area. Further ports were introduced if necessary. If the identified pathology was suitable to be treated by laparoscopy, this was done. Otherwise, abdominal incision was placed as seen appropriate by laparoscopy findings. If no pathology was found, the procedure was terminated and the diagnosis of NSAP was made. If the appendix was not satisfactorily visualised on laparoscopy and patient's symptoms were suggestive of suspected appendicitis, open appendectomy was done.

### *Postoperative*

Postoperative hospital stay, laparoscopy related complication and hospital re-admission were recorded.

## RESULTS

### *Patients' Characteristics:*

This study was done between February 1999 and February 2003. It included forty three patients (4 males & 39 females) admitted with NSAP of median age 29 years (range 16-57) years (Table 1).

### **Outcome of Laparoscopy**

Nine patients were found to have acute appendicitis on laparoscopy (Fig.1). Seven had laparoscopic appendectomy (Figs. 2&3); the remaining two had open appendectomy. Twelve patients were found to have gynaecological pathology (Tables 2 & 3; Figs 4, 5 & 6). One patient had localised perforation of caecal diverticulitis. He was treated by limited right hemicolectomy. One patient had Crohn's disease that was treated conservatively. Nineteen patients had normal laparoscopy and they had been diagnosed as 'NSAP'. They are treated conservatively and were allowed to go home once their symptoms were controlled. No patient had negative laparotomy.

### **Postoperative Hospital Stay**

Median postoperative stay in patients who were diagnosed to have NSAP after laparoscopy was 2 days

(range 1-5 days). In the remaining patients who had surgical intervention following diagnostic laparoscopy had median hospital stay of 5 days (range 3-16 days).

### **Laparoscopy related complications**

One patient (2%) had superficial wound infection in the site of umbilical port. This settled on oral antibiotics.

### **Hospital readmission**

One patient (2%) required readmission within 2 days of discharge due to exacerbation of the pain. No further investigations were done. The patient was discharged home after observation for 24 hours.

**Table (1): Characteristics of patients with non-specific abdominal pain.**

Age	29 years (16-57)
Sex	
Male : Female	4 (9%):39 (91%)
White cell count (x106 per litre)	11 000 (5300-14800)

**Table (2): Outcome of Laparoscopy in patients with non-specific abdominal pain**

Pathology identified	No.	%
Appendicitis	9	20.9%
Gynaecological pathology	12	27.9%
Ovarian cyst (twisted/ ruptured)	4	
Pelvic inflammatory disease	5	
Endometriosis	3	
Caecal diverticulitis	1	2%
Crohn's disease	1	2%
Caecal Carcinoma	1	2%
No pathology identified		
Non-specific abdominal pain	19	44.2%
Total	43	

**Table (3): Surgical Procedures:**

Surgical Procedure	No.	%
Open appendectomy	4	9.3%
Laparoscopic appendectomy	5	11.6%
Right hemicolectomy (open)	2	4%
Ovarian cystectomy / Ovariectomy (4 laparoscopic, 1 open)	5	11.6%



*Fig. (1): Acute appendicitis on laparoscopy.*



*Fig.(2): Dissection of the mesoappendix.*



*Fig.(3): Application of endo-loop on the base of the appendix.*



*Fig.(4): Ovarian endometriosis.*



*Fig.(5): Ovarian Torsion.*

## DISCUSSION

NSAP is a significant problem in general surgery and accounts for an estimated 13-40 percent of all emergency surgical admissions<sup>(1)</sup>. Although computer-aided diagnosis can improve diagnostic rates by at least 20%,<sup>(9)</sup> these programs are unpopular. Other researchers have suggested ultrasonography, thermography, peritoneal cytology, computed tomography (CT) with or without enhancement, and more recently, spiral CT<sup>(10)</sup>. The diagnostic potential of laparoscopy in cases of acute or chronic abdominal pain is substantial<sup>(8)</sup>. However, general surgeons, unlike gynaecologists, are still somewhat reluctant to use laparoscopy for these disorders<sup>(11)</sup>. Until the arrival of a technique that guarantees a correct diagnosis every time, surgeons will keep the delicate balance between an aggressive pursuit of the diagnosis and the avoidance of unnecessary surgery<sup>(8)</sup>.

In patients with acute abdominal pain and uncertain diagnosis, laparoscopy permits identification of those patients who require emergency or urgent surgery and those who should be treated conservatively. In this last group hospital stay needed for observation is reduced<sup>(3)</sup>.

We found, as reported by other studies<sup>(3,6-7)</sup>, that laparoscopy is particularly useful in women of child bearing age in whom tubo-ovarian abnormality often presents with acute right lower abdominal pain simulating acute appendicitis. Some 15% of patients with acute abdominal pain who are subjected to an unnecessary appendectomy suffer complications of the operation which, in women, may result in infertility<sup>(3)</sup>. For this reason, it has been our policy to avoid removal of macroscopically normal looking appendixes and we have not encountered a single instance when this policy resulted in missed acute disease.

In most of the studies analysis of the resource implications of NSAP, it becomes obvious that 'hotel' costs comprise the major proportion (90%) of the resultant expenses, reflecting the relatively long mean hospital stay of these patients.<sup>(1)</sup> Indeed, bitter complaints of persistent symptoms and resistance to discharge from hospital without a 'diagnosis' are not atypical features of many patients with NSAP. Without doubt, these features, combined with a natural desire in the surgeon to ensure that nothing serious is overlooked, contribute to the excessive hospital stay of this group of patients.<sup>(12)</sup> Our proposed approach of early laparoscopy would help early discharge once acute surgical pathology that would require surgical intervention is excluded.

Without laparoscopy the overall rate of unnecessary appendectomy in women is reported to be approximately 39 per cent compared with 15 per cent in men.<sup>(11)</sup> Although

a smaller number of men presented with NSAP in the present study, early laparoscopy proved to be valuable as it helped to diagnose more serious intra-peritoneal pathology (caecal carcinoma (2%) & caecal diverticulitis (2%)). However, we agree with other authors that laparoscopy is of limited value for male patients with clear clinical diagnosis of acute appendicitis.<sup>(6,8)</sup>

Early laparoscopy also has the benefit that a number of therapeutic options are available.<sup>(7)</sup> In this study, diagnostic laparoscopy became therapeutic. Ovarian cysts can be drained and an ovarian torsion treated with immediate relief of symptoms.<sup>(13)</sup> Purulent fluid collections secondary to pelvic inflammatory disease (PID) or diverticulitis can be drained. Early recognition of PID enables early treatment which is important if complications such as infertility are to be minimized. Women with undiagnosed endometriosis may benefit from early diagnosis; an inflamed appendix can be removed safely and effectively laparoscopically. Laparoscopic adhesiolysis is possible.<sup>(8)</sup>

De Dombal et al<sup>(14)</sup>, have reported that 10 per cent of patients aged over 50 years who presented with NSAP later developed gastrointestinal malignancy. One patient in this study was found to have a caecal carcinoma on laparoscopy.

Hospital readmission is a significant problem in patients with acute NSAP when conservative approach is used.<sup>(1)</sup> The rate of hospital re-admission with NSAP following negative laparoscopy in this study was only 2%. This is similar what has been reported in other studies which used early laparoscopy in acute NSAP<sup>(8,11,12)</sup>.

## CONCLUSION

Early laparoscopy is valuable in the management of acute NSAP. It provides a significantly high diagnostic accuracy, permits early patient discharge and minimise the incidence of unnecessary appendectomy & laparotomy. Laparoscopy is particularly useful in the management of acute NSAP in young women of child-bearing age.

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