

Emergency Laparoscopic Surgery—The Changi General Hospital Experience

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Abstract

Introduction: This paper analyses the emergency laparoscopic procedures undertaken by our unit over a 1-year period in an effort to evaluate the diagnostic-therapeutic use of laparoscopy in an emergency situation. **Materials and Methods:** This is a retrospective study that analysed 137 emergency laparoscopic procedures that were performed for patients who presented with acute abdominal pain over a 1-year period from 31 December 1999 to 31 December 2000. **Results:** A definitive diagnosis was made in 91.2% (125). Of the 78 cases that required surgical intervention, 71.8% (56) were performed laparoscopically. The conversion rate (to open surgery) was 16.8% (23) and the morbidity rate was 8% (11); with no mortalities. **Conclusion:** We conclude that laparoscopic surgery is effective and safe in the non-elective setting and it offers a high potential for diagnosis and therapy in selected patients in whom the diagnoses are equivocal.

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Key words: Abdominal pain, Effective, Equivocal diagnoses, Safe

Introduction

Today, laparoscopic surgery has achieved widespread acceptance among surgeons as well as the general public. Emergency laparoscopic procedures (ELPs) have been performed since the 1960s¹ and with increasing experience, the benefits of laparoscopic surgery are being applied to non-elective situations.

To date, there are no local studies evaluating the efficacy/safety of ELPs in the literature. The aim of this study was to evaluate the diagnostic/therapeutic use of emergency laparoscopic surgery as well as its safety/benefits in the local context.

Materials and Methods

From 31 December 1999 to 31 December 2000, 137 emergency laparoscopic procedures were performed by the General Surgery Department of Changi General Hospital. This included all non-elective, emergency admissions that underwent laparoscopy, regardless of whether the operation was later converted to an open procedure.

A retrospective analysis of the data was performed to evaluate the demographic breakdown of the patients, the different diagnoses that were found, the diagnostic and therapeutic rates, the conversion rates, and the morbidity

and mortality rates. These data will give us an indication of the efficacy and safety of the ELPs performed by us.

Results

Patient Demographics (Table I)

78.1% (107) of the patients were females and 21.9% (30) were males. 59.1% (81) were Chinese, 21.2% (29) were Malays and 19.7% (27) were others. 49.6% (68) were 30 years of age or younger, 38.7% (53) were 31 to 50 years old and 11.7% (16) were older than 50 years.

Diagnoses (Table I)

The two main diagnoses were gynaecological-related diseases and acute appendicitis. Gynaecological-related pathologies made up 39.4% (54) of the cases while appendicitis made up 24.8% (34).

There were 8.8% (12) with gallbladder-related pathologies and 2.9% with perforated peptic ulcer. There were 8.8% (12) with no obvious intra-abdominal pathologies and 15.3% (21) with diagnoses other than any of the above (e.g. small bowel ischaemia, perforated large bowel diverticulum and Meckel's diverticulum).

A definitive diagnosis was made in 91.2% (125) of the cases and we were unable to come up with a definitive diagnosis in 8.8% (12) of the cases. There were 78 cases

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TABLE I: PATIENT DEMOGRAPHICS AND DIAGNOSES

	No.	(%)
Race		
Chinese	81	59.1
Malays	29	21.2
Others	27	19.7
Age (y)		
≤ 30	68	49.6
31 to 50	53	38.7
> 50	16	11.7
Sex		
Female	107	78.1
Male	30	21.9
Diagnosis		
Gynaecological	54	39.4
Appendicitis	34	24.8
Gallbladder related	12	8.8
Perforated peptic ulcer	4	2.9
No obvious diagnosis	12	8.8
Others	21	15.3

(56.9%) that required surgical intervention and 59 cases (43.1%) that did not. Of the 78 cases that required surgical intervention, 56 cases (71.8%) were performed laparoscopically and 22 (28.2%) had to be converted to an open method.

Morbidity and Mortality

There were 11 (8%) morbidities. Eight of these were wound infections, 2 were re-admissions for recurrence of abdominal pain, with no subsequent adverse sequelae, and 1 was inadvertent Veress needle injury to a large vessel during intraoperative insertion. There were no mortalities.

Conversion Rate

There were 23 cases (16.8%) that were converted to open surgery for the reasons of poor visibility and/or technical difficulties.

Discussion

The acute abdomen continues to be a large part of the general surgeon's workload and abdominal pain of uncertain aetiology (non-specific abdominal pain; NSAP) is the commonest reason for emergency surgical admission.² With increasing experience, the benefits of laparoscopy are being applied to emergency indications such as the evaluation of non-specific abdominal pain with the potential for therapeutic interventions.

The majority of our patients were Chinese (59.1%), females (78.1%) and of child-bearing age (below 50 years of age, 88.3%). In line with this distribution is the fact that gynaecological-related pathologies made up 39.4% (54) of the cases.

The 3 commonest diagnoses in this study were:

1. Gynaecological-related pathologies—54 cases (39.4%) included pelvic inflammatory disease (PID), endometriosis, ovarian cysts and ectopic pregnancies. Of these 54 cases, only 19 cases (35.2%) required surgical intervention.
2. Acute appendicitis—34 cases or 24.8%
3. Gallbladder-related pathologies—12 cases or 8.8%.

From the above results, we can see that the majority of operations performed were diagnostic laparoscopies, laparoscopic appendectomies and laparoscopic cholecystectomies. With improvements in technique and training, more complicated procedures like laparoscopic ovarian cystectomy, laparoscopic repair of perforated peptic ulcers and laparoscopic resection of Meckel's diverticulum were also performed.

Many studies have shown that the negative laparotomy rate is significantly higher in young women (up to 45%)³⁻⁶ because of the prevalence of gynaecological-related diseases. It is obvious from the above results that laparoscopy can be of great value in this group of patients in terms of diagnosis and therapy, and in reducing the negative laparotomy rate by screening out the cases that do not require surgical intervention (only 35.2% of the gynaecological-related cases required surgical intervention, thus potentially saving a laparotomy for the majority of these patients).

A definitive diagnosis was made in 91.2% of the cases and there were only 12 cases (8.8%) where no obvious intra-abdominal pathology was found. This figure compares favourably with an Italian study⁷ in a study population of 365 cases where a definitive diagnosis was made in 95.3% of cases. Only 56.9% (n = 78) of our cases required surgical intervention and of these, 71.8% (n = 56) were performed laparoscopically.

The conversion rate in our study was 16.8% (n = 23). It is known that the conversion rate in ELPs is higher¹ as visibility and technical difficulties are more likely and the tolerance level for conversion should rightly be lower.

In our study, there were 11 morbidities (8%) and no mortalities. The figures in the Italian study were 4.1% and 0.8%, respectively.⁷

In our study, 8 of these morbidities were wound infections, 2 were re-admissions for recurrence of abdominal pain, with no subsequent adverse sequelae, and a single case of inadvertent Veress needle injury to a large vessel during intraoperative insertion. Injury to the major retroperitoneal vessels is a known potential complication of laparoscopy when the Veress needle or trocar is inserted via the blind approach. Many studies⁸⁻¹¹ have recommended using the open access technique over the closed technique as the

potential for serious visceral and vascular complications is less. The lessons learnt from this particular case of vascular injury have led to a progressive shift in the surgeons within our unit using the open access technique over the blind approach.

Conclusion

Emergency laparoscopic surgery is a useful and safe tool in a surgeon's armamentarium. It provides diagnostic accuracy and therapeutic capabilities and would be of particular value in female patients of child-bearing age, in whom the possibility of gynaecological-related causes of abdominal pain are high, and in whom cosmesis and the need to reduce any negative laparotomy rate would be important issues.

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