

# MORBIDITY AND MORTALITY FOLLOWING RE-LAPAROTOMY ON DEMAND

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## ABSTRACT

- Objective* To evaluate the outcome in terms of morbidity and mortality after re-laparotomy on demand in patients with secondary peritonitis.
- Study design* Descriptive study.
- Place & Duration of study* Department of Surgery Jinnah Postgraduate Medical Center (JPMC) Karachi, from February 2006-February 2007.
- Patients and Methods* All those patients who presented through OPD / emergency or admitted in surgical wards of JPMC and underwent re-laparotomy on demand were included in the study.
- Results* A total 30 patients were included in the study with male to female ratio of 1:1.3. Mean age of patient population was 31.37 years. Most common indication of re-laparotomy was intra abdominal abscess in 63%. Most common complication encountered was wound infection in 90%. Variables which adversely affected the outcome were APACHE II score =15, time interval between index surgery and re-laparotomy of more than one week, multiple re-laparotomies, existence of sepsis and multi-organ dysfunction syndrome. About 40% patients died.
- Conclusion* Re-laparotomy on demand is a useful procedure to eradicate persistent or recurrent infection associated with reasonable morbidity and mortality provided if undertaken at right time with the decision being taken after close and meticulous surveillance.
- Key words* Re-laparotomy on demand, Morbidity, APACHE II.

## INTRODUCTION:

Peritonitis is a common emergency encountered by surgeons' world over. Secondary peritonitis is caused by loss of integrity of viscus due to infection, ischemic necrosis, trauma or peritonitis occurring as a result

of postoperative complications.<sup>1</sup> Source control in the form of surgical or percutaneous drainage is the mainstay of treatment.<sup>2</sup>

Treatment strategies in case of persistent intra-abdominal sepsis includes laparostomy (leaving abdomen open) or repeated planned or on demand laparotomies.<sup>3,4</sup> Re-laparotomy on demand is defined as re-exploration after initial laparotomy carried out only when clinical condition of patient deteriorates.<sup>5</sup> Re-laparotomy on demand recently gained attention because of improvement in imaging techniques with

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which patients who can be benefited from re-laparotomy can be selected.<sup>6</sup>

There is continuous argument about application of different treatment strategies, but in consideration of high mortality rate due to continuing sepsis in patients of secondary peritonitis effective treatment strategies need to be developed to improve overall outcome.

This study aimed at evaluating the role of re-laparotomy on demand in controlling intra-abdominal infection and to find outcome in terms of morbidity and mortality.

**PATIENTS AND METHODS:**

Study was conducted at the Department of General Surgery Jinnah Postgraduate Medical Centre Karachi, from February 2006 to February 2007. Study included patients of both sexes who were above 14 years of age and underwent re-laparotomy on demand; while patients who underwent planned re-exploration were excluded. Re-laparotomy on demand was defined as emergency re-exploration done only when clinical condition of the patient deteriorated or failed to improve or if there was sonological or CT evidence of intra abdominal collection.

All those patients who either presented through OPD, emergency or admitted in ward and fulfilled the inclusion criteria, were enrolled. Evaluation was done by detailed history, examination and investigations. Statistical analysis was done on SPSS version 10.

**RESULTS:**

Thirty patients who underwent re-laparotomy on demand were included in the study. Out of these patients 17 were females and 13 males with male

female ratio of 1:1.3. Mean age of patient population was 31.37 years ± 13.21. Twenty patients had first surgery done at our institute while 10 patients were referred from other institutes. Sixteen of our patients had first surgery done electively while 14 had initial exploration done in emergency. Twenty patients had their initial surgery done for gastrointestinal pathology, 04 patients had hepatobiliary and 02 had pancreatic pathology.

Common indications for carrying out laparotomy were intra abdominal abscess in 19 patients and sepsis in 14 patients followed by anastomotic leak in 9, enterocutaneous fistula in 8 and perforation and hemorrhage in 2 patients each (table I). There was considerable overlap between the complications requiring re-laparotomy. Out of 30 patients 05 had undergone re-laparotomy more than once. Mean time interval between index surgery and re-laparotomy was 7.43 days (ranging from 1- 18 days).

Morbidity was assessed by recording APACHE II score, length of hospital stay and ICU stay, need for mechanical ventilation and postoperative complications. APACHE II score was calculated at time of admission with mean score of 9 (ranging between 0-20) while clinical progress was assessed with calculation of APACHE II score at re-exploration with mean score of 13 (ranging from 6 – 20). Twenty one patients had APACHE II of = 15 while 09 patients had a score of >15. Mean hospital stay was 30.73 days (ranging from 3 – 63 days). Seventeen patients required ICU care with mean ICU stay of 2.83 days (0-15 days). Eight patients required mechanical ventilation. Complications occurred in patients is shown table II. Twelve patients died during study period with overall mortality rate of 40 %.

**Table I: Indications of Re-laparotomy on demand**

S No	Indications	No	Percentage	95% C.I*	p Value
1	Intra abdominal abscess	19	63	45.2-78.9	0.144
2	Anastomotic leak	09	30	13.2-44.4	0.28
3	Enterocutaneous fistula	08	26.6	15.7-47.9	0.11
4	Perforation	02	6.6	1.1-20.3	0.001
5	Hemorrhage	02	6.6	1.1-20.3	0.715
6	Sepsis	14	46.6	29.5-64.4	0.001

\*C.I= confidence interval, Chi square value=15.885 P value= 0.003

**Table II: Complications**

S No	Complications	No	Percentage	95% C.I.*	p Value
1	Wound infection	27	90	75.1-97.3	<0.01
2	Recurrent collection	08	26.6	13.2-44.4	0.11
3	Enterocutaneous fistula	08	26.6	13.2-44.4	0.01
4	Sepsis	07	23.3	10.8-40.7	0.003
5	Multi organ dysfunction syndrome	07	23.3	10.8-40.7	0.003
6	Hemorrhage	03	10	2.6 – 24.8	0.001
7	Anastomotic leak	02	6.6	1.1- 20.3	<0.01

\* C.I.= confidence interval

**DISCUSSION:**

Previous studies showed a high mortality of 50 – 80% after re-laparotomy.<sup>7</sup> The main focus of interest regarding treatment of peritonitis are the factors that either alone or in combination, capable of influencing the outcome of the disease. Literature review shows that advanced age is an important prognostic factors. Koperna and Schulz reported in their study that age > 70 years was the most frequent occurrence in their patients and it also had a significant impact on survival with mortality of 67.3% versus 35.8% in younger age group.<sup>8,9</sup> In our study this significant prognostic implication could not be found. Overall mortality was higher among younger age group i.e. 58.6% for < 35 years and 41% for 35-55 years.

Variety of systems have been described for assessment of severity of illness in critically ill patients.<sup>10</sup> APACHE II score is most widely accepted. Physiological derangements measured by APACHE II score are valuable for predicting outcome in patients with secondary peritonitis. A study reported higher mortality with high APACHE II score. It was <5% if APACHE II was less than 15 and 47% if APACHE II was more than 15.<sup>11</sup> The significance of high preoperative APACHE II was also confirmed in our series as mortality was 28% among patients with APACHE II score of <15 and 66.6% in patients with score of >15.

One of most important factors for determining mortality after re-laparotomy is the reason for re-exploration. In an other study the most common re-laparotomy indication was anastomotic leak (41.97%) followed by hemorrhage (18.51%) and perforation (9.87%).<sup>11</sup> Our patients had more than one

complications that lead to re- exploration but most commonly re-laparotomy was performed due to intra-abdominal abscesses and persistent sepsis, (63%).

Source of peritonitis also has prognostic significance as it was found that mortality rate was highest among patients undergoing gastrointestinal surgery probably due to septic nature of contaminants. Out of 20 patients who underwent re-exploration for GI pathology nine patients expired with overall mortality rate of 45%.

Another factor that influenced outcome following re-laparotomy was the time interval between initial surgery and re-laparotomy. In one study re-exploration performed more than 48 hours after first surgery resulted in a higher mortality (77%) as compared to those done within 48 hours.<sup>12,13</sup> Same was true in our patients as mortality rate was 25% for patients explored within 48 hours and 41% for patients operated after an interval of more than one week.

In previous reports mortality rate following single versus multiple re-laparotomies was 30.6% and 65.6% respectively.<sup>14</sup> In our study the mortality rate following multiple re-laparotomy was almost 80% in comparison to 32% following single re-laparotomy. Septic abdomen remains an interesting challenge in general surgery and there is still no consensus as to how to approach this condition.<sup>15</sup> Our study although provides valuable information about outcome following re-laparotomy on demand for secondary peritonitis but due to small sample size, effect of initial pathology on mortality and

morbidity and referral bias, results can not be generalized. The APACHE II score is used as a predictor of outcome but it is not independent of effect of treatment and might lead to considerable bias in evaluating treatment policies. Hence it is still required to conduct large multicenter trials to compare various methods of controlling postoperative sepsis and to evaluate a gold standard treatment.

**CONCLUSIONS:**

Re-laparotomy on demand is effective and useful method of controlling persistent infection with acceptable safety margin provided it is undertaken before the onset of severe physiological derangement and multiorgan dysfunction.

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