

# Segregation in Serious Cases of Perforative Peritonitis

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## Abstract

**Background:** Emergencies like perforative peritonitis present in various clinical forms ranging from early presentation to presentation in septic shock state. An indigenous system based on important clinical parameters, hematology and biochemical profile of patients which can help in segregating serious cases which in turn can be referred to still higher centers should be devised. Chest and cardiac evaluation have been given veto powers. This means that even if other criteria suggest that patient should be taken in and chest/cardiac evaluation shows high risk, the case is referred to higher center. The objective criteria are in evolving stage and brought to readership through this article for further improvement based on individual's experience.

**Aims:** To use an objective criteria or algorithm which could help in segregating and selecting right cases of abdominal emergencies particularly perforating peritonitis so that mortality is avoided by taking up a wrong case (which cannot be treated at such a under resourced centre).

**Materials and Methods:** Although there are several scoring systems available for severe peritonitis, but over last 10 years 256 cases of perforation peritonitis coming to SGT Medical College, Budhera, Gurugram, Haryana, formed the material of study. All patients were screened through following parameters e.g. age, de-hydration, pulse/b.p., urine output, haemoglobin, S. albumin, blood urea, S. creatinine, S. sodium, S. potassium. Based on these parameters patients were divided into category I and II. Category I patients were retained for further management at the peripheral centers while Category II patients were subjected to resuscitation by intravenous fluids, blood, antibiotics etc. for 4 h. All the parameters as above were again evaluated after 4 h and if the patient moved to category I it was retained for further management otherwise it was referred to a tertiary care centre.

**Result:** After applying all these criteria, initially 190 patients were found to belong to category I while 66 to category II [Table 1]. These 66 patients were subjected to intensive resuscitation and monitoring and reevaluation was done after 4 h. As a result of resuscitation 13 patients had climbed to category I while 53 still remained in category II. All these 53 patients were referred to still higher centre. All the 203 patients who were taken were subjected to exploratory laparotomy where relevant pathology was appropriately dealt i.e. closure of duodenal perforation or enteric perforation etc. Thus we see that majority of the patients had duodenal perforation and enteric perforations. There were 2 patients having uterine perforations. In the present series the mortality is nil because of selection criteria of taking in the patient in a peripheral under resourced centre. Superficial wound dehiscence and stitch sepsis were the most common complications in the present series.

**Conclusion:** By applying objective criteria for segregating serious illnesses requiring surgical intervention e.g. perforative peritonitis, it would be a good idea to segregate more serious cases right at the outset, maximum within 4 h of admission and this can be termed as segregation of non traumatic serious cases. The zero mortality in the present study is another evidence to indicate that if cases are properly selected keeping in mind the limitations and lack of resources of peripheral centers, a good care can be given to those who fit into the facilities available at that centre.

**Key words:** Higher centers, Peritonitis, Segregation

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## INTRODUCTION

Abdominal emergencies are common in surgical practice. The lethality still remains high<sup>[1]</sup> and has been studied by modern statistical analysis also.<sup>[2]</sup> Many patients land in severe toxic state with delayed diagnosis and treatment.<sup>[3]</sup>

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The presence of pus and fecal material adversely affects mortality.<sup>[4]</sup> The volume of abdominal emergencies is so large that all these patients do not go to tertiary care center due to logistics prevailing in India.

Moreover, tertiary care centers may not be able to deal with such a large volume in view of the limit of their capacity-facilities and workforce. Past few decades have seen up gradation of clinical working and surgical profile of serious cases coming to peripheral centers which are not as equipped as tertiary care centers and are able to share a significant load of such cases.

These peripheral centers although under-resourced can tackle serious abdominal emergencies; it is difficult to provide surgicare to all such cases. Hence, realizing the strength and weaknesses of peripheral centers, the author decided to use an objective criteria or algorithm which could help in segregating and selecting right cases of abdominal emergencies, particularly perforating peritonitis so that mortality is avoided by taking up a wrong case. The cases which are beyond the purview of management of the peripheral centers are referred to a tertiary care center. The author has realized that by adopting such an objective policy the unnecessary load of routine cases or cases which can be managed at peripheral level will be filtered and not put undue load on a tertiary care center. This policy of segregating serious patients (which are to be referred to a tertiary care center) is also advantageous to prevent any outrage, damage to hospital, and manhandling of health-care professionals because otherwise any mortality in serious abdominal emergencies is impulsively reacted by the attendants.

This article elaborates the objective parameters on which patients are segregated, and the author has found it useful particularly over past decade.

## MATERIALS AND METHODS

Although there are several scoring systems available for severe peritonitis,<sup>[5]</sup> over past 10 years, 256 cases of perforation peritonitis coming to SGT Medical College, Budhera, Gurugram, formed the material of study. All patients were screened through following parameters.

Parameters	Favorable	Unfavorable
Age	<50 years	>50 years
De-hydration	Nil	Present
Pulse/B.P.	90/normal	>90/systolic hypotension
Urine output	Normal	Decreased
Hemoglobin	<9	>9
S. Albumin	Normal	Decreased
Blood urea	Normal	Raised

S. Creatinine	Normal	Raised
S. Sodium	Normal	Decreased
S. Potassium	Normal	Hypo/hyperkalemia

These parameters were evolved by a pilot study where it was found that these parameters play a role in making decision of segregation of serious cases. All the patients were subjected to above 10 parameters and were finally grouped into two categories.

1. Category 1: Where  $\leq 4$  parameters were positive
2. Category 2: Where  $> 4$  parameters were positive, importance being given to urine output, S. Albumin, blood urea, and hemoglobin.

However, the clinical assessment of chest along with chest X-ray and cardiac assessment along with electrocardiography (ECG) was given veto power. By veto power, it is meant that if clinical assessment of chest and chest X-ray was normal as informed by the physician-patient was taken in otherwise referred to a tertiary care center even if it belonged to Category 1, similarly, if cardiac status and ECG were normal as informed by the physician, the case was taken in otherwise referred to a tertiary care center even if it belonged to Category 1.

Based on categorization as mentioned in table above, Category 1 patients were retained for further management at the peripheral centers while Category 2 patients were subjected to resuscitation by intravenous fluids, blood, antibiotics, etc., for 4 h. All the parameters as listed in the table above were again evaluated after 4 h and if the patient moved to Category 1 it was retained for further management. Otherwise, it was referred to a tertiary care center.

**Table 1: Categorization, n=256**

Category	Number of patients
1	190
2	66

**Table 2: Categorization after resuscitation, n=66**

Category	Number of patients
1	13
2	44
Veto criteria	9

**Table 3: Details of referred cases, n=53**

Parameters	Criteria	Number of patients
Veto	Veto chest	3
	Veto cardiac	6
Category parameters	>5 positive	2
	>6 positive	2
	>7 positive	18
	>8 positive	22

We did not take blood gas analysis during our assessment at peripheral centers because this facility is not available.

## RESULTS

After applying all these criteria, initially, 190 patients were found to belong to Category 1 while 66 to Category 2 [Table 1]. These 66 patients were subjected to intensive resuscitation and monitoring, and reevaluation was done after 4 h. As a result of resuscitation, 13 patients had climbed to Category 1 while 53 still remained in Category 2 [Table 2]. All these 53 patients were referred to an advanced care center and detailed analysis of these 53 patients showed that 9 patients belonged to veto criteria, i.e., in 3 patient's chest condition and/or chest X-ray was not optimal and were labeled by a physician as very high-risk patients. Another 6 patients were found to be extremely high risk on cardiac and ECG evaluation. These patients had either history of recent myocardial infarction or unstable angina or varying degrees of heart blocks or some kind of arrhythmia [Table 3]. In fact, these 9 patients were also subjected to intensive resuscitation which was actually uncalled for. Resuscitation should have been given only to 44 patients. However, this overlap on 9 patients of veto criteria occurred because opinions of physicians after the complete evaluation were available 2–3 h of start of resuscitation. Majority patients of Category 2 had eight positive criteria (22 patients), followed by 18 patients having 7 positive criteria. 2 patients each had five and six positive criteria [Table 3].

**Table 4: Final intake and referral of cases,  $n=256$**

Category	Number of patients
1	203
2	53

**Table 5: Profile of operative pathology in operated cases,  $n=203$**

Pathology	Number of cases
Duodenal perforation	95
Enteric perforation	88
Appendicular perforation	18
Uterine perforation	2

**Table 6: Morbidity profile,  $n=203$**

Complication/morbidity	Number of patients
Burst abdomen	9
Superficial dehiscence	43
Stitch sepsis	25
Urinary tract infection	9
Superficial thrombophlebitis	17
Fecal fistula	0

All the 203 patients who were taken in Table 4 were subjected to exploratory laparotomy where relevant pathology was appropriately dealt, i.e., closure of duodenal perforation or enteric perforation, etc. This was followed by a thorough peritoneal lavage and putting in abdominal drains all the operated cases of peritonitis were give standard post-operative treatment consisting of nil per orally, Ryle's tube aspiration, IV fluids, IV antibiotics (cephalosporin gen III, aminoglycosides, and metronidazole), continuous oxygen for minimum 24 h, and analgesics. Once the patient passes flatus, Ryle's tube aspiration decreased to 100–150 ml and the color of Ryle's tube aspirate became that of gastric juice, the Ryle's tube was removed and they were allowed orally. Early ambulation was our policy and stitches were removed on 12<sup>th</sup>–14<sup>th</sup> day. Those showing evidence of burst abdomen on 3<sup>rd</sup>–5<sup>th</sup> post-operative day in the form of copious serous discharge were taken up for emergency secondary suturing. Any superficial dehiscence encountered during post-operative periods or after removal of stitches was dealt appropriately. The operative findings of 203 operated patients are depicted in Table 5. Thus, we see that majority of the patients had duodenal perforation and enteric perforations. There were 2 patients having uterine perforations. In the present series, the mortality is nil due to segregation in serious cases. The morbidity in the form of various complications is depicted in Table 6. Superficial wound dehiscence and stitch sepsis were the most common complications in the present series.

## DISCUSSION

The Indian subcontinent is a developing country where health-care delivery system still needs up gradation. By various statistical data released by Government of India, the doctor population of India is far from expected level. 70% of the population of this country resides in rural area and does not have prompt and good access to even specialist care what to say of super specialist services. Cost of Medicare of metro cities and corporate hospitals is a prohibitive factor for poor and rural population. Although steps are being taken at government level and efforts are going for improving health-care delivery to the last man in the queue, yet, the gap cannot be allowed to remain unfulfilled in wait of development of the entire system. It is due to these reasons that health-care centers in Class 2 and 3 towns in India have to take lead. As already said, an entire load of serious illnesses requiring surgical intervention like perforative peritonitis cannot be taken by tertiary care centers for obvious limitations of the hospital and population both. The peripheral centers have to play a big role to fulfill the above gap by providing health services at

a lower cost. However, at the same time, these peripheral centers are not as fully developed and well equipped and have to seek the help of advanced/tertiary care/higher centers. In such a situation, if some objective criteria are applied for segregating serious illnesses requiring surgical intervention, for example, perforative peritonitis, following things can be achieved:

1. Avoidance of unnecessary mortality by directing very high-risk cases directly to tertiary care centers, rather than referring them at a later stage from peripheral centers.
2. In the eventuality of death of such serious cases at peripheral centers (not referred to higher centers), emotionally charged relatives and attendants go on rampage, damage, and destroy the hospital property and building and manhandle the health-care professionals. These problems get compounded if legal remedy is sought for such criminal activities. This all can be avoided by following our policy of referring based on objective criteria.
3. Segregation of serious cases like perforative peritonitis will reduce undue caseload on tertiary care centers allowing clinicians of such centers to really focus on limited serious cases.

By the results in the present study, it would be a good idea to segregate more serious cases right at the outset maximum within 4 h of admission and this can be termed as triage of non-traumatic serious cases. Despite huge advances in diagnostics, antibiotics, and monitoring, the mortality still remains very high.<sup>[6]</sup> The zero mortality in the present study is another evidence to indicate that if cases are properly selected keeping in mind the limitations and lack of

resources of peripheral centers, a good care can be given to those who fit into the facilities available at that center. The complications encountered in the present series [Table 6] are important causes of prolonged hospitalization and significant action requires to be taken for them to reduce the duration of hospitalization.

Although the criteria adopted in the present study are still in evolving stage yet remain very useful to as of now for peripheral centers as a single significant measure to reduce mortality. Continued analysis of various factors from various high-volume peripheral centers encountering such cases can result into the evolution of better/addition criteria. Needless to say, study involving the large number of cases is required to further improve on the scoring system, so that perfect triage is done and mortality is brought to zero in under-resourced, underprivileged, and not so well equipped peripheral centers.

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