

## Post-Operative Benefits of Nasogastric Tubes in Patients with Gut Resection and Anastomosis: Myth or Reality?

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### ABSTRACT

**Objective:** To analyze the post-operative benefits of nasogastric tubes among patients undergoing gut resection and anastomosis at our surgical unit.

**Study Design:** Prospective comparative study.

**Place and Duration of Study:** Surgical Department, Combined Military Hospital, Rawalpindi Pakistan, from Jun 2019 to Mar 2020.

**Methodology:** This study was conducted on 80 patients who underwent gut resection and anastomosis due to localized cause at surgical unit of our hospital. With block randomization method half of the patients received nasogastric (NG) tube after the surgery while half did not. Presence of nausea or vomiting, pain abdomen, return of bowel sounds and electrolyte imbalance were compared in both the groups.

**Results:** Out of 80 patients included in the final analysis 50(62.5%) were male and 30(37.5%) were female. Mean age of patients put who underwent the gut resection and anastomosis procedure in our study was  $41.34 \pm 5.147$  years. Chi-square test revealed that all parameters included in the study did not differ significantly among patients with and without nasogastric tube after the surgery.

**Conclusion:** Administration of nasogastric tube did not prove any better in reducing the post-operative abdominal pain, nausea and vomiting. It also did not prove to be effective in preventing the electrolyte imbalance and helping in returning the bowel sounds early. Patients with and without nasogastric tube had equal chance of having any of the complications.

**Keywords:** Nasogastric tube, Post-operative complications, Resection and anastomosis.

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### INTRODUCTION

Abdominal surgeries have been commonly performed in all the surgical centers of the world routinely.<sup>1</sup> Gut resection and anastomosis sometimes remain as only option in case of intestinal obstruction emergencies.<sup>2</sup> Like all other surgeries, surgical procedure of gut resection and anastomosis too involve a lot of local and systemic adverse effects.<sup>3</sup> Various steps have been adopted before, during and after the surgery to avoid the complications and ensure the speedy recovery of the patient.<sup>4</sup>

Nasogastric tube has been a simple feeding instrument which was used by the clinicians even in 1800s.<sup>5</sup> In current era, it is not merely used as a feeding tube but has a lot of other clinical utilities which make it an effective multipurpose device. It can be used to administer the medications and clean the stomach in case of overdose or poisoning. For years it has been used after the abdominal surgeries with the purpose of

decompression and expediting the recovery of normal gut functioning.<sup>6</sup>

Studies have been done in all parts of the world on use of nasogastric tube after the abdominal surgeries especially those involving gut resection and anastomosis. Bauer in a paper published in 2013 concluded that nasogastric tube provides no additional benefit for any post-surgical parameters related to intestinal tract after the surgery. Duration of hospital admission and restoration of gut motility and no statistically significant relationship with use of nasogastric tube among patients undergoing abdominal surgery. Even wound complications or systemic adverse effects have no added benefit with nasogastric tube rather it increases the chances of nasopharynx inflammatory conditions. It also had no role in reducing the post-operative nausea, vomiting, and distension.<sup>7</sup> Verma *et al.* in 2007 designed a literature review with the objective to look for the benefits of nasogastric tube in the patients undergoing abdominal surgery. They concluded that bowel functioning and pulmonary adverse effects were more in patients who had been

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put on nasogastric tube as compared to patients without nasogastric intubation. Other adverse effects or complications were equal in both the groups and nasogastric tube provided added benefit for no postoperative complication.<sup>8</sup> Cunningham *et al.* published a trial for patients undergoing gut anastomosis regarding benefits of nasogastric tube. Their results showed that all the gastrointestinal tract related complications were more in the group which did not have nasogastric tube and patients with nasogastric tube were more at risk of long hospital stay and delayed return of the bowel movements. All the systemic complications were equally distributed in both groups and no statistically significant relationship was found in any of the groups.<sup>9</sup>

Nasogastric tube is not an expensive intervention but still it causes a lot of discomfort to the patients and its use without proven benefit may not be advisable. Local data has been limited in this regard. Shamil *et al.* in 2010 did a study in local population undergoing elective enteric anastomosis and concluded that only minor post-operative complications were experienced if nasogastric tube was omitted but all other complications may they be GI tract related or systemic were not influenced by removing the nasogastric tube from these patients.<sup>10</sup> We planned this study with the objective to analyze the post-operative benefits of nasogastric tubes among patients undergoing gut resection and anastomosis at surgical unit of a tertiary care military hospital of Pakistan.

## METHODOLOGY

The prospective comparative was conducted at the Surgical Department of Combined Military Hospital, Rawalpindi Pakistan, from June 2019 to March 2020. Sample size was calculated by who Sample Size Calculator by using population prevalence proportion of complications of nasogastric tube as 2%.<sup>9</sup> Non probability Consecutive sampling technique was used to gather the sample.

**Inclusion Criteria:** All patients between the age of 18 and 65 years who underwent gut resection and anastomosis due to any non malignant cause were included in the study.

**Exclusion Criteria:** Patients with uncontrolled diabetes or hypertension or any other physical illness. Patients with any solid or hematological malignancy were also made part of the exclusion criteria. Patients who had recent history of illicit substance use or those who were undergoing redo surgeries were also not included in the final analysis.

After ethical approval from the ethical review board committee (IREB Letter no: A/28/EC/118) and written informed consent from potential participants, patients who were undergoing gut resection and anastomosis due to any non-malignant cause at CMH RWP fulfilling the above mentioned inclusion and exclusion criteria were included in the study. Routine analgesia and antibiotic cover were given to each patient as per the hospital protocol and condition of the patient. With block randomization patients were divided into two equal groups. One group was administered with nasogastric tube after the surgery while other was not. Detailed assessment regarding the general health status and study parameters was done on all the patients by the consultant surgeon at 48 hours and then every 12 hours till the patient has been declared fit for discharge. Post-operative abdominal pain was recorded on visual analogue scale (VAS) score. Score greater than 6 was regarded as significant pain.<sup>11</sup> Electrolytes like sodium, potassium, chloride and calcium were investigated from laboratory of own hospital and international standards were used to diagnose the patient as suffering from any electrolyte imbalance.<sup>12</sup> A time of forty-eight hours was used as cut off for the return of bowel sounds.<sup>13</sup> A special proforma was designed for this study including the socio demographic profile and all the parameters included in the study.

All statistical analysis was performed by using the Statistics Package for Social Sciences version 24.0 (SPSS-24.0). Patients were divided into two categories i-e patients who were administered nasogastric tube after the surgery and patients who were not administered the same after the surgery. Nausea or vomiting, pain abdomen, return of bowel sounds and electrolyte imbalance were compared in both the groups with and without the nasogastric tube by using the chi-square test. The *p*-values than or equal to 0.05 were considered as significant.

## RESULTS

A total of 80 patients undergoing gut resection and anastomosis in surgical department during the given time period were included in the final analysis. Table-I shows the general characteristics of study population. Out of 80 study participants, 50(62.5%) patients were male and 30(37.5%) patients were female. Mean age of patients put who underwent the gut resection and anastomosis procedure in our study was 41.34±5.147 years. Mean duration of post-operative hospital stay was 5.3±2.41 days. Chi-square test in

Table-II revealed that nausea or vomiting, pain abdomen, return of bowel sounds and electrolyte imbalance did not differ significantly among patients with and without nasogastric tube after the surgery ( $p$ -value>0.05).

**Table-I: Characteristics of Study Participants (n=80)**

Parameters	n(%)
<b>Age (years)</b>	
Mean±SD	41.34±5.147 years
Range (min-max)	20-59 years
<b>Gender</b>	
Male	50(62.5%)
Female	30(37.5%)
Mean Hospital stay	5.3±2.41 days
<b>Post-operative nausea/vomiting</b>	
No	58(72.5%)
Yes	22(27.5%)
<b>Electrolyte imbalance</b>	
No	65(81.25%)
Yes	15(18.75%)

**Table-II: Difference of Clinical Factors in both Groups(n=80)**

Factors	Patients without Nasogastric tube	Patients with nasogastric tube	$p$ -value
<b>Post-operative pain</b>			
No	28(70%)	30(75%)	0.616
Yes	12(30%)	10(25%)	
<b>Electrolyte imbalance</b>			
No	34(85%)	31(77.5%)	0.389
Yes	06(15%)	09(22.5%)	
<b>Nausea/Vomiting</b>			
No	31(77.5%)	27(67.5%)	0.316
Yes	09(22.5%)	13(32.5%)	
<b>Return of bowel sounds</b>			
<48 hours	29(72.5%)	21(52.5%)	0.063
>48 hours	11(27.5%)	19(47.5%)	

## DISCUSSION

Prevention of post-operative complications after the surgery has always been an area of interest for the researchers and the clinicians. A good surgeon is the one who has adequate knowledge regarding all the possible complications and he readily take measures to avoid these complications. Jawaid *et al.* in 2006 published a study highlighting that after fever, nausea and vomiting have been the commonest complications faced by the patients undergoing any abdominal surgery. Adequate knowledge about these complications can only lead the staff on duty to pick them early in the patients and manage effectively without delay in order to avoid the serious consequences.<sup>14</sup> For years nasogastric tube has been used as a preventive measure for a lot of complications especially post-operative nausea and vomiting and returning of early

bowel sounds. We planned this study with the rationale to analyze the post-operative benefits of nasogastric tubes among patients undergoing gut resection and anastomosis at our surgical department in combined military hospital Rawalpindi, Pakistan.

Qureshi *et al.* in 2009 published a study in journal of college of physicians and surgeons Pakistan with the objective to determine advantages and disadvantages of postoperative nasogastric intubation after small bowel anastomosis. They concluded that all local and systemic parameters related to complications among the post-surgical patients were equal in the group of patients who did not receive the nasogastric tube as compared to those who had it. Abdominal girth, post operative nausea or vomiting and returning of the bowel sounds were the main parameters included in their study. Our results supported their findings after 10 years and all parameters of our study were also found insignificant in both the groups concluding that passing the nasogastric tube did not provide any additional benefit to these patients.<sup>15</sup>

Weijs *et al.* in 2017 performed a systematic review and meta-analysis of literature regarding nasogastric decompression following esophagectomy. They concluded that no adverse outcomes related to surgery were found more in patients in whom nasogastric tube was not passed or removed earlier. They mainly included the randomized trials in this regard and also used duration of post-surgical hospital stay as one of the parameters which was also same in both the groups with or without the nasogastric tube.<sup>16</sup> Though ours was a simple comparative study but our results also highlighted that passing nasogastric tube after the surgery has no added benefit for any of the parameters.

MacRae *et al.* in 1992 performed a similar study with the findings that all the local or systemic complications had no statistically significant difference between the patients with and without administration of NG tube after the abdominal surgery. They concluded that decompression procedure with nasogastric tube may not be continued as a protocol in patients undergoign abdominal surgery as it provides no additional benefit.<sup>17</sup> Findings of our study also highlight that abdominal pain, nausea and vomiting, returning of bowel sounds and electrolyte imbalances were not found statistically different in both the groups.

Ojerskog *et al.* in 1983 evaluated the role of nasogastric tube decompression procedure in preventing the adverse effects related to abdominal surgeries.

They came up with the findings that no difference in complications or use of support exist between the patients with and without the nasogastric tube decompression. They suggested that there may be no harm in omission of this procedure before the abdominal surgeries because of lack of evidence regarding any benefits to the patients in terms of prevention of any complications.<sup>18</sup> After so many years, we also concluded with our results that practice of passing NG tube to each and every patient after gut resection and anastomosis has no added benefit.

Blinding was not possible with the study design and nature of intervention observed. This could affect the interpretation of results and prone towards the bias. Discomfort due to nasogastric tube was not recorded which could have been an interesting information and could favor the non-nasogastric group more as now results showed that both groups have no difference. Future studies with strict control of confounding factors and blinding if possible may reveal results which could be generalized to the local population and help the clinicians and researchers to formulate local guidelines in this regard.

**CONCLUSION**

Administration of nasogastric tube did not prove any better in reducing the post-operative abdominal pain, nausea and vomiting. It also did not prove to be effective in preventing the electrolyte imbalance and helping in returning the bowel sounds early. Patients with and without nasogastric tube had equal chance of having any of the complications.

**Conflict of Interest:** None.

**Author’s Contribution:**

Following authors have made substantial contributions to the manuscript as under:

MAA & MQB: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

MMA & MA: Data acquisition, data analysis, approval of the final version to be published.

SI & ZQB: Critical review, concept, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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