

# Feasibility And Safety Of Early Oral Feeding After Cervical Esophagogastrostomy

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## Abstract

Cervical esophagogastrostomy has proved to be a safe and satisfying procedure after esophageal resection or bypass but leak rates in the range of 5 to 44% have been reported. Although these leaks are not as catastrophic as with a thoracic anastomosis, the surgeon is still faced with a demoralized patient who cannot be started on oral feeds due to a leak in the neck followed by stricture formation. Presently we routinely give oral feeding to our patient on the 5th postoperative day. To further decrease the postoperative stay and to evaluate the feasibility and safety of early oral feeding after cervical esophagogastrostomy this study was proposed. Of 35 patients included in this study, 19 were randomized to undergo a gastrografin study on the 3rd postoperative day (2 patients could not undergo the study as they are in ICU and ventilator) and 16 on the 5th postoperative day. Clinically if no leak was demonstrated, oral feeding was started on the same day. Out of 17 patients in group I (3rd day), one had a leak on gastrografin study and four had clinical leaks after oral feeding. The person who had a leak on gastrografin study did not have any clinical leak and was allowed orally and never had a clinical leak. Four persons who had clinical leaks (between 4 to 8 days) did not have any leak on gastrografin study and all were managed conservatively. Of 16 patients in group II (5th day), 3 had clinical leaks after oral feeding and gastrografin study was able to detect leak in only one of these who were managed conservatively. The difference between both groups was not statistically significant. One of the patients who was on ventilator and could not undergo gastrografin study expired due to respiratory insufficiency and multiple organ failure whereas all the remaining patients were discharged. The mean hospital stay in third day group was 13.6 days and in fifth day group was 12.2 days which was not statistically significant.

## BACKGROUND

Cervical esophagogastrostomy has proved to be a safe and satisfying procedure for reconstruction of upper digestive tract after esophageal resection or bypass. Though the dangerous complications of a thoracic anastomosis have been circumvented by doing it in the neck, leak from a cervical anastomosis carries its own problems. It has been shown that the factors determining the occurrence of a leak include the exposure of the surgeon and the technique itself with a variance being seen in hand sewn vs. stapled anastomosis and in single layer vs. double layer techniques.

Conventional treatment after bowel resection entails starvation with administration of IV fluids until passage of flatus. This delay in initiating feeding was thought to be necessary to prevent nausea and vomiting and to allow the anastomosis to heal.

Radiological and electrophysiological studies have shown that small bowel recovers normal motility and function 4 to 8 hrs after surgery, stomach within 24 to 36 hrs, right colon

within 24 to 48 hrs and left colon within 72 hrs, thereby showing that no delay in transit will occur till the left colon is reached. Earlier reports have noted no deleterious effects with early nasojejunal feeding.<sup>1,2,3,4</sup>

Early enteral feeding has been shown to maintain gut mucosal barrier, reduce septic complications and prevent the development of negative nitrogen balance; all of which possibly contribute to the maintenance of gut immune system and enhance wound healing. Early enteral feeding improves outcome in patient with trauma, burns and after bowel resection.<sup>5</sup>

Having practiced a single technique of cervical esophagogastric anastomosis at AIIMS for the last 20 years, a reasonable level of confidence has been built up regarding the safety and efficacy of the procedure. Currently patients are being routinely asked to start oral feeds on postoperative day 5. No prospective study is available regarding early feeding after cervical esophagogastric anastomosis. To further decrease postoperative stay and indirectly the cost of

health care, this prospective randomized controlled study is proposed to see the feasibility and safety of early oral feeding after a cervical oesophagogastric anastomosis.

### **PATIENTS AND METHODS**

All patients undergoing cervical esophagogastric anastomosis irrespective of the underlying disease in the department of GI Surgery at AIIMS from May 1999 to December 2000 are included in the study. All patients who have an obvious clinical leak on the third postoperative day are excluded. During this period 35 patients have undergone cervical esophagogastric anastomosis. All patients with squamous cell carcinoma of the oesophagus received pre operative short course radiotherapy (25 Gray, 5 fractions) to the primary tumor.

The anastomosis was performed with 3 zero atraumatic silk in two layers using interrupted stitches. The sternocleidomastoid muscle whose sternal head was divided during exposure of the esophagus was not re-sutured. A red rubber corrugated drain was placed parallel to the anastomosis and brought out through a separate incision in the infra clavicular region. All patients had a feeding jejunostomy performed using a number 12 Fr malecot catheter.

All patients on the third postoperative day were assessed for the presence of any leak. Patients who did not have any leak were randomized using random numbers, into two groups. Nasogastric tube was removed on third postoperative day. Patients in Group 1 underwent gastrografen study on day three followed by test feeding with water. Patients in Group 2 underwent Gastrografen study on day five followed by test feeding with water. End point of Group 1 was evidence of any leak after intake of fluids on day three till discharge. Similar conditions were applied to Group 2. Both groups were reviewed on the first follow up visit. The contrast study was done in the radiology department with fluoroscopic observation as well as permanent recording on X-ray film. After this all patients were tested for anastomotic leak in the ward using 'test feeding' with water. After removing the drain site dressing and cleaning, patients were asked to take sips of water and the neck drain site was watched for any leakage of water. When there was no leak of water, the patient was asked to continue with oral liquids followed by a semisolid diet on the same day. If a small leak was discovered, oral feeding was continued after applying digital pressure on the anastomotic site while swallowing after adequately explaining to the patient. If the leak persisted or

increased, the patient was switched over to jejunostomy feeding, which was continued till the leak stopped or reduced significantly, as assessed by test feeding.

Gastrografen study findings were recorded for each patient but they were not used for making any therapeutic decisions. The hospital course of each patient was carefully recorded with a special emphasis on complications related to the cervical anastomosis and leakage from the same and duration of hospital stay. Results of clinical leak and leaks on gastrografen study were noted.

Statistical analysis was done with Chi squared test for categorical data and Student's T test for continuous variables. A P value less than 0.05 was considered significant.

### **RESULTS**

A total of 35 patients were included in the study. Of these 19 were randomized for oral feeding on third day and 16 were randomized for oral feeding on 5 th day . Gastrografen study and oral feeding could not be performed on two patients randomized to 3 rd day as they were on ventilator and in Intensive Care Unit (ICU). Both groups were comparable in all respects. The demographic characteristics, clinical findings and investigations are provided in Tables I to III.

Out of 17 patients in group I, one had a leak on Gastrografen study and four had clinical leaks after oral feeding. The person who had a leak on Gastrografen study did not have any clinical leaks and was allowed orally and never had a clinical leak. Four persons who had clinical leaks (between 4 to 8 days) did not have any leak on gastrografen study and all were managed conservatively.

Of 16 patients in group II, 3 had clinical leaks after oral feeding and gastrografen study was able to detect leak in only one of these. The difference between both groups was not statistically significant.

Out of 35 patient's included in the study two patients randomized to group II could not undergo gastrografen study and oral feeding as they were in intensive care unit and on ventilator. One of these patients expired due to respiratory insufficiency and multiple organ failure whereas all the remaining patients were discharged. The mean hospital stay in group I was 13.6 days and in fifth day group was 12.2 days which was not statistically significant.

**Figure 1**

Table I : Demographic characteristics, clinical findings of patients

	Group I Oral feeding 3 <sup>rd</sup> day	Group II Oral feeding 5 <sup>th</sup> day
Age		
< 50 years	8	5
> 50 years	9	11
Mean	48.89	55.68 (p 0.1036)
Sex		
Male	11	11
Female	6	5
Co morbid conditions		
Diabetes	2	1
Hypertension/ IHD	5	4
TB	1	0
Bronchial asthma	0	1
Aetiology		
Benign	3	1
Corrosive stricture	1	0
Achalasia	1	0
Miscellaneous	1	1
<b>Malignant</b>	14	15
SCC	11	10
Adenocarcinoma	3	5

**Figure 2**

Table II : Comparison of investigations and surgical treatment done in two groups

	Group I Oral feeding 3 <sup>rd</sup> day	Group II Oral feeding 5 <sup>th</sup> day
Hemoglobin		
* <10	2	2
* >10	15	13
Mean	12.44	12.63 (p= 0.33)
Albumin		
* <3.5	4	3
* >3.5	13	13
Mean	4.12	4 (p= 0.47)
Preoperative radiotherapy	11	9 (p= 0.45)
Type of surgery		
<b>section</b>	15	13
A. Malignant	13	13
B. Benign	2	0
<b>By pass</b>	2	3
A. Malignant	1	2
B. Benign	1	1 (p= 0.37)
Route of organ		
*Post mediastinal	13	13
*Substernal	4	3
Intraoperative		
Blood loss		
* < 500 ml	5	4
* > 500 ml	12	12
Mean	563.15	593.15 (p= 0.67)

**Figure 3**

Table III : Features of leak and Hospital stay in two groups

	Group I Oral feeding 3 <sup>rd</sup> day(17)	Group II Oral feeding 5 <sup>th</sup> day(16)
Gastrograffin study		
Leak		
Present	1	1
Absent	16	15
Clinical leak		
Present	4	3
Absent	13	13 (p=1.0)
Day of leak		
Early < 7 day	3	1
Late > 7 day	1	2
Hospital stay		
< 10 days	8	5
> 10 days	9	11
Mean	13.68	12.25 (p=0.5)

## DISCUSSION

Esophageal surgery is performed widely. A cervical esophagogastric anastomosis is done for both benign and malignant diseases. It can be performed after transhiatal esophagectomy or palliative esophageal bypass. Advantages of this approach are that it allows a longer length of esophagus to be resected in malignancy and anastomotic leak in the neck are much safer for the patient than thoracic leaks.<sup>6,7,8</sup> The leak does not track down to the mediastinum even though the leakage rate has been shown to be higher in cervical anastomosis<sup>7</sup>. The norm in the postoperative management of the thoracic esophagogastric anastomosis is to evaluate the anastomosis for leaks using radiological contrast studies, such as Barium swallow or Gastrograffin study before allowing oral feeding . Though the practice has been questioned this norm has been widely applied to patients who have a cervical anastomosis <sup>9</sup>.

Oral feeding after cervical esophagogastric anastomosis is usually not started early because of the fear of leak. Although no studies have compared the time required for adequate healing of cervical and thoracic anastomosis, circumstantial evidence suggests that cervical anastomosis heal more slowly than their thoracic counterpart<sup>10</sup>.

Very early in the healing period, contiguous mediastinal tissues become adherent to the area of esophageal anastomosis, they appear to be an effective sealing barrier and add strength to the suture line . Since the patient is swallowing saliva<sup>11</sup> of about 1.5 liters from the moment of awakening from the operation it supports the fact that oral feeds can cross the anastomosis safely. Oral hygiene is one of the factors responsible for a leak<sup>12</sup>. Virulence of an esophageal anastomotic leak is often directly related to the bacterial contamination of surrounding tissues by swallowed oral bacteria<sup>13</sup>. Early oral feeding improves oral hygiene and indirectly may decrease the incidence and virulence of the leak

Orringer<sup>14</sup> gives oral feeds 24hrs after removing nasogastric tube which he usually does between 3rd and 5th postoperative day. A barium swallow is obtained on the 6th or 7th postoperative day before discharging the patient. Vigneswaran et al<sup>15</sup> use a water soluble contrast agent on the 7th postoperative day followed by oral feeding. There is substantial evidence to support the safety of early oral feeding after intestinal and colorectal surgery.<sup>16,17,18,19</sup> There are no previous studies available regarding early oral feeding after cervical esophagogastric anastomosis. With the experience gained in the postoperative management of cervical esophagogastric anastomosis over the years we planned a randomized trial to assess the feasibility and safety of early oral feeding after cervical esophagogastric anastomosis and whether it causes decreased hospital stay. This indirectly causes efficient medical care, cost containment to the patient and the hospital, minimizes the exposure to hospital pathogens and allows the patient to recuperate at home more comfortably.

In this study the patient characteristics in both groups were comparable and in two patients in group I gastrograffin study could not be done as the patients were on ventilator and in ICU. Age, hemoglobin, albumin, co-morbid conditions, preoperative radiotherapy, etiology ( benign and malignant), type of surgery ( resection and bypass), route ( post mediastinal or substernal) and intra operative blood loss were compared between 17 patients in the group I and 16 in group II. There was no statistically significant difference detected. Gastrograffin study detected one leak in group I, which was clinically silent, patient was allowed to take orally and had no problems. It also detected one leak in the group II; patient developed a clinical leak on the 8th day, managed conservatively and was able to take orally and discharged. Clinical leaks developed in 4 patients in group I

which were missed by contrast study two of which occurred in patients undergoing substernal bypass. It is widely known that retrosternal gastric reconstruction has a wider leak rate than when the stomach is taken through the posterior mediastinum as evidenced by several studies<sup>8,12,19,20</sup>. Resection of a portion of manubrium, 1st rib and clavicle is advisable to minimize compressive effects. All these leaks developed between day 4 to 8. There was only one leak on day 8. All the four patients who had developed leaks were managed conservatively; one patient got discharged against medical advice and lost to follow up. Out of three patients discharged after conservative management two were on regular follow up while the remaining patient expired after six months.

Clinical leaks developed in 3 patients in the group II all of which are adenocarcinomas and they had received no radiotherapy. All had undergone resection with one having positive resection margins and two leaks occurred in patients > 70 years. Malignant involvement of resection margins have been implicated as an etiological factor for anastomotic leaks in some studies<sup>21</sup> but not in others<sup>14</sup>. Nevertheless, the importance of obtaining negative resection margins is obvious. Out of the four patients who leaked in the third day group only two were more than 50 years and had a mean age of 45.5 years. All the three patients who had leaked in the 5th day group were more than 50 years with a mean age of 71 years. Advanced age is an inconsistent risk factor for anastomotic leaks<sup>14,22</sup>. Two of the three leaks occurred late on the 8th day while one occurred on 6th day. Out of these one patient was on regular follow up, one developed stricture and the other one expired after five months. There was no statistical significance between the two groups of clinical leaks.

Out of 7 leaks in both groups Gastrografen study was able to detect only one leak. One leak detected on gastrografen study had no clinical leak. Hence gastrografen study may not be required for detection of cervical anastomotic leaks. Gotley et al<sup>23</sup> noticed that leaks manifested before being detected by radiological studies in all cases. In one report of transhiatal esophagectomies, half of clinically apparent leaks became evident after a contrast study on the 7th postoperative day was negative for leakage<sup>10</sup>. Some of these late anastomotic leaks may be explained by false negative contrast studies, but it is unlikely that all late leaks are really missed early leaks<sup>15</sup>. In one study by Goel et al<sup>24</sup> test feeding with water in the ward was found to be superior to gastrografen study.

In the present study the duration of the post operative hospital stay in the group I was 13.6 days with a range of 6-46 days. Overall mean post operative stay in group II was 12.2 days with a range of 7-28 days. Even though the number of patients staying more than 10 days is less in group I (9/17) compared to the group II(11/16), the mean duration of hospital stay is not less in group II because of prolonged stay of 2 patients for more than 25 days due to pulmonary complications.

Most of the esophagogastric anastomotic patients are demoralized as they are unable to take orally for a long time. In this study although it is difficult for quantitative measurements there is a feeling of well being of the patients who are fed orally early. The positive psychological impact of feeding after surgery may have an important role in the recovery process.

### CONCLUSION

This study shows that early oral feeding after esophagogastric anastomosis is feasible and safe with no increase in leak rate. However it has not been shown to decrease the hospital stay because without uniform criteria for discharge many other factors may distort this variable as a measure of success of early feeding.

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