



# ORIGINAL RESEARCH PAPER

Gastroenterology

## AN ANALYSIS OF 175 CONSECUTIVE GASTRECTOMY SPECIMEN REPORTS FOR ASSESSING ADEQUACY OF SURGICAL RESECTION-NEED FOR IMPROVEMENT OF SURGICAL STANDARD -OBSERVATIONAL STUDY

KEY WORDS:

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### ABSTRACT

Adequacy of surgery (margins, lymph node yield) , and biology of tumour(differentiation, lymph node ratio, lymphovascular invasion) determined by histopathological specimen reports which will guide in the improvement of standards of care. Audit of the histopathological reports of 175 consecutive gastrectomy specimens(97subtotal ,78total ) of cases between 2013-2016. As the histopathology reports follow minimum standards in reporting (1) variables like T and N stage , grade of differentiation , resection margin status,lymphnode yield, lymph node ratio , lymphovascular invasion status of the total and subtotal group of specimens was analyzed.Most of the subtotal gastrectomy(85.4%,n=82) and total gastrectomy specimens(85.8%) were T3.Overall, T2 were 2.8%(n= 5 ,all subtotal),T3 were 85.1% (n=149,82subtotal, 67-Total gastrectomy), and T4 were 12% (n= 21, 10 subtotal, 11 total). The adequacy of lymph node yield for staging (n>15,N3 )was higher in total( 91% ,n=71) than subtotal (81.4%,n=79) specimens .The mean lymph node yield was higher in total (mean-18.17,range-12-27) than subtotal gastrectomy (mean -15.6, range -1-25 ) specimens . R1+ margins were seen in 10.3% of subtotal gastrectomy (n=10) and seen in 8.9%(n=7) of total gastrectomy specimens with the proximal margin in all(n=7, 100%) .Emergency surgery (5.7%)(n=10 – subtotal -8, total -2, )when compared to elective surgery (94.2%)(n=165, subtotal – 89, total – 76, )showed more specimens being R1+ (50%,n=4) than elective (4.45, n=4) with less number of nodes harvested (10.2 emergency vs 15.8 in elective) .

**Conclusion:** Larger macroscopic tumor size , poorer histology, increased lymph node ratio , emergency surgery and lack of specialized technical expertise were significantly correlated with poor outcome irrespective of type of gastrectomy .overall Periodical audit of the pathological specimen reports needed in clinical practice to assess the standard of surgery

### Background of the study

Gastric cancer is the third leading cause of cancer related in the world(1).in India it is the 2<sup>nd</sup> most common cause of cancer related death.(2).efforts are taken to improve this scenario by improving the surgical and multimodality care. Complete surgical removal of invasive tumor is the primary aim of curative D2 gastrectomy. Complete macroscopic and microscopic resection of tumour (R0 resection) has been shown to be one of the strongest significant and independent predictors of outcome. Hence the adequacy of surgery (margins, lymph node yield) , and biology of tumor(differentiation, lymph node ratio, lymphovascular invasion) determined by histopathological specimen reports which will guide in the improvement of standards of care.

### Aim of the study

To analyze information in histopathology reports after gastrectomy regarding adequacy of surgical procedure(margin, lymph node yield) , tumor biology (grade, histology, lymph node positivity , lymph vascular invasion ) TNM staging and its relation to setting of surgery (emergency or elective). and also to analyze the metastatic lymph node ratio in predicting the prognosis

### Materials and methods

Audit of the histopathological reports of 175 consecutive gastrectomy specimens(97subtotal ,78total ) of cases between 2013-2016. The gastrectomy specimen was properly oriented, with the proximal and distal margins marked by the assistant

surgeon and the nodes along the stations carefully dissected after extracting the specimen and sent separately for examination by the pathologist.

As the histopathology reports follow minimum standards in reporting (1) variables like T and N stage , grade of differentiation , resection margin status,lymphnode yeild, lymphnode ratio n lymphovascular invasion status of the \_total and subtotal group of specimens was analysed.

### Results

#### T stage of tumor

Most of the subtotal gastrectomy(85.4%,n=82) and total gastrectomy specimens(85.8%) were T3.Overall, T2 were 2.8%(n= 5 ,all subtotal),T3 were 85.1% (n=149,82subtotal, 67-Total gastrectomy), and T4 were 12% (n= 21, 10 subtotal, 11 total).

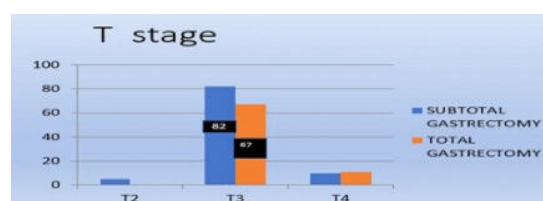
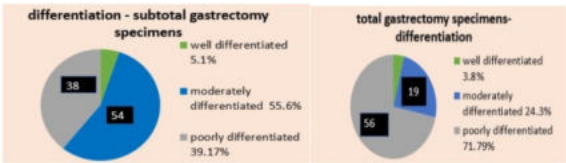


Fig 1. T stage of the subtotal and total gastrectomy specimens

Grade of tumor

Most Subtotal gastrectomy specimens were moderately differentiated(n=54, 55.6%) . Well differentiated (n=5) was seen in 5.1% and poorly differentiated (n=38,) in 39.17%.and lymphovascular invasion was seen in 37.1% (n=36) of all subtotal specimens .Lymphovascular invasion was more commonly seen in poorly differentiated(n=25,69.4%) than moderately differentiated specimens(n=11, 30.6%).



differentiated (n= 39, 75%) than moderately differentiated specimens.(n=13, 25%).Most Total gastrectomy specimens were poorly differentiated( n= 56, 71.7%) and moderately differentiated were 24.3%(n=19) and well differentiated being 3.8% of all subtotal gastrectomy specimens (n=3) .Lymphovascular invasion was seen in 66.7%(n=52) of all gastrectomy specimens where they were more commonly seen in poorly

Fig3. Differentiation of total gastrectomy specimens

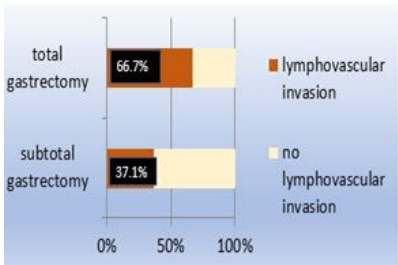


Fig 4.comparison of lymphovascular invasion between subtotal and total gastrectomy specimens

Adequacy of staging and absolute lymph node yield

The adequacy of lymph node yield for staging (n>15,N3 )was higher in total( 91% ,n=71) than subtotal (81.4%,n=79) specimens

The mean lymph node yield was higher in total (mean-18.17,range-12-27) than subtotal gastrectomy (mean -15.6, range-1-25) specimens .

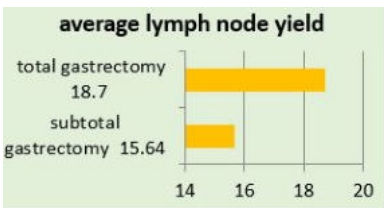


Fig 5.Comparison of average lymph node yield lymph node yield

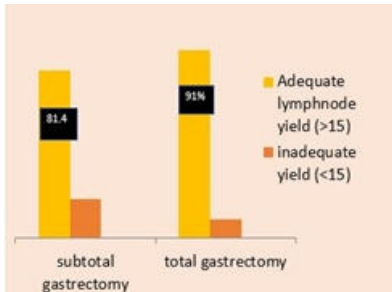


Fig 6.Comparison of adequacy of between subtotal and total gastrectomy

specimensbetween subtotal and total gastrectomy specimens

Metaststic Lymph node ratio(MLR)

Metaststic Lymph node ratio(MLR) is the number of positive to total retrieved nodes and Lymph node ratio can be further classified into MLR0, 0; MLR1, >0-0.3; MLR2, >0.3-0.6 and MLR3, >0.6 (3)..The difference was statistically significant in total (n=0.5) than subtotal (n=0.35) specimens, though came under MLR2.Even in pN2, both specimen types came under MLR2 though the ratio was higher for Total than subtotal gastrectomy specimens.

Margin status R1+ margins were seen in 10.3% of subtotal gastrectomy (n=10) specimens . Most were involving the proximal margin(80%) especially in antral tumors involving the lesser curve (n=6,75%). R1+ margins were seen in 8.9%(n=7) of total gastrectomy specimens with the proximal margin in all(n=7, 100%).

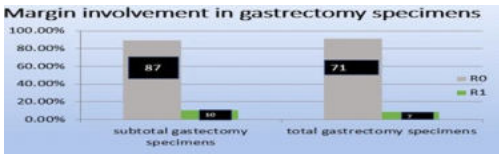


Fig 6.Comparison of margin positivity between subtotal and total gastrectomy specimens

Larger macroscopic tumor size , poorer histology increased lymph node ratio , emergency surgery and lack of specialized technical expertise were significantly correlated with margin positivity irrespective of type of gastrectomy

Elective vs emergency surgery

Emergency surgery (5.7%)(n=10 – subtotal -8, total -2, )when compared to elective surgery (94.2%)(n=165, subtotal – 89, total – 76,) showed more specimens being R1+ (50%,n=4) than elective (4.45, n=4 ) with less number of nodes harvested (10.2 emergency vs 15.8 in elective)

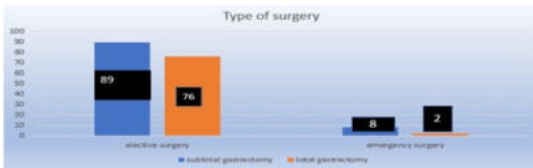


Fig 7.Comparison of elective vs emergency surgery between subtotal and total gastrectomy specimens

Table 1: Comparison of variables between subtotal and total gastrectomy specimens.

Variable	Subtotal specimens(n =97)	Total specimen( n=78)	P value
Tstage			
T2	5	0	
T3	82	67	NS
T4	10	11	NS
Differentiation			
Well differentiated	5	3	
Moderately differentiated	53	19	NS
Poorly differentiated	38	56	S*
R1+	10	7	NS
Adequacy of lymph node yield (>15)	79	71	NS
Absolute lymph node yield	15.6	18.7	NS
Lymph node ratio (MLR)	0.3(MLR2)	0.5(MLR 2)	
Lymph node ratio (MLR)-pN2(R0)	0.3	0.5	

S→ P<0.05 NS-not significant , S-significant

Table 2: Comparison of R1 gastrectomy specimens

Variable	Subtotal specimens(n=10)	Total specimen(n=7)
Tstage		
T3	5	5
T4	5	2
Type of tumour	Distal gastric ca involving lesser curve-8 Diffuse -2	Ca og junction (siewert type 3)-5 Proximal ca - 1 MEN1-1
Differentiation		
Moderately differentiated	6	2
Poorly differentiated	4	5
LVI+	10	7
Margin involvement	Proximal -8(80%) Distal -2(20%)	Proximal - 7(100%)
Lymph node ratio	0.4	0.6

### Statistical analysis

The variables are compared using t test and of proportion between non categorical variables and chi square test for categorical variables

### Discussion

D2 Gastrectomy , subtotal or total is the standard of care in management of for>T1b gastric cancer as accepted by surgical committees worldwide(3).The adequacy of D2 gastrectomy is determined by histopathological analysis of the gastrectomy specimen – this will provide information regarding survival of patient ( Disease free survival and overall survival))

The minimum data set standards(7) in pathological reporting have improved pathological content comprising all the basic information necessary for adequate staging. Completeness of local excision of tumour is the critical factor in defining potentially curative surgery, and the single most important prognostic parameter for individual patients undergoing surgical resection.

In our study Total gastrectomy specimens are associated with higher lymph node yield ,positivity, histological grade and lymphovascular invasion than subtotal specimens reflecting the biological aggressiveness of these tumors which must have mandated wider resection in the first place.This scenario may also be related to the increased availability nodal stations like stations 10,12 which will be included in total gastrectomy.

In accordance with this study(8) it was proved that MLR was better than the current pN staging system and showed a strong correlation with pT stage (depth of invasion). In pN2 stage, MLR demonstrated a further separation of patient survival . However, in pN1 or pN3, there was no additional impact on survival.. It is to be noted that LNR was a better prognostic factor for survival in pN2(<15 lymph nodes) than pN3(>15 Lymph nodes)(3).

It has also been postulated that MLR is an independent prognostic factor irrespective of number of examined nodes.(9,10)

In this study proximal margin is most commonly involved margin. Involvement along the lesser curve for subtotal gastrectomy and GE junction tumors in total gastrectomy specimens .this scenario emphasize the need of intraoperative frozen section and need of extendingthe resection margins as the margin positivity influences the outcome. surprisingly distal margin was negative probably related application of staplers. Higher margin positivity is related directly to tumor involving the proximal margin , higher T stage, poorer grade of differentiation, emergency surgeries and subtotal resection. In emergency setting are mostly associated with R1 resection revealing a role for frozen section couldnot possible in this group .

### Conclusion

Adequate lymph node retrieval is important for staging and for prognostication also. ,increased lymph node ratio and

lymphnode positivity had significant correlations with margin positivity irrespective of the type of gastrectomy.R1 positive status for proximal margin implies the need for frozen section at least in specific subgroups for subtotal eg. Diffuse ca, distal gastric cancer involving lesser curve ,fortotal gastrectomy in .OGjunction (siewert type 3), diffuse ca during and resection in the emergency setting .D2 gastrectomy in emergency setting to be avoided as specimens yields poor pathological outcomes in terms of R1 status

Larger macroscopic tumor size , poorer histology, increased lymph node ratio , emergency surgery and lack of specialized technical expertise were significantly correlated with poor outcome irrespective of type of gastrectomy .overallPeriodical audit of the pathological specimen reports needed in clinical practice to asses the standard of surgery.

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