4.24]), T-spine (HR 2.38 [1.15, 4.92]), and aorta (HR 2.20 [1.04, 4.66]) independently predicted for worse OS.

Conclusion: Dose to the heart, spine, aorta, and body predict for G4L, which is associated with worse RFS and OS. Achieving planning constraints for these parameters may decrease G4L and improve outcomes.

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Post-Treatment ANC is Predictive of Poorer Overall Survival and Disease-Free Survival in Esophageal Cancer Patients after Tri-Modality Therapy

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Purpose/Objective(s): Although neutrophils serve important roles in inflammation and host defense, increasing evidence points towards their involvement in tumorigenesis and progression. Recent studies show that increased pre-treatment neutrophils associate with disease recurrence and survival rates in esophageal cancer. Here, we evaluate the association of post-treatment absolute neutrophil count (ANC) with survival outcomes in primary non-metastatic esophageal cancer patients who have received tri-modality therapy.

Materials/Methods: We reviewed 219 consecutive patients with stage I-III esophageal cancer who completed tri-modality therapy at our center between 1/2007 and 12/2015. Of the 219 patients, 123 completed all treatments within 5 months of starting radiation and had available ANC at 6 months after start of radiation (range: +/- 1 month). 70 (57%) were $>$ 60 years old, and 110 (89%) were male. 116 (94%) tumors were adenocarcinoma, 89 (72%) were stage III, and 120 (98%) were located distally. 120 (98%) received induction chemotherapy of which 77 (64%) received platinum-taxane (PT). All received concurrent chemotherapy of which 69 (56%) received PT. 90 (73%) had the same induction and concurrent agents. 118 (96%) received intensity modulated radiation therapy, with median dose of radiation being 5040cGy in 28 fractions (range: 4320-5600cGy). Kaplan-Meier survival, log-rank tests, and multivariate Cox regression were used to analyze the association of ANC with survival outcomes.

Results: The median follow up was 31 months (range: 5.7-119.9 months). Multivariate Cox regression using age, gender, KPS, stage, histology, tumor location, time to surgery, induction PT, concurrent PT, lung V20, mean heart dose, PTV size, and pre- and post-treatment ANC showed that increased 6-month ANC was predictive of worse overall survival/OS ($p=0.0001$, HR 1.3). The median ANC was 3.9 K/microliter (range: 0.9-30.4). When stratified by median ANC, patients with ANC $>$ 3.9 had significantly worse OS compared to those with ANC $\leq$ 3.9 (5-year OS = 35% vs 57%, $p=0.049$), and the disease-free survival (DFS) was also worse although this was not significant (5-year DFS = 11% vs 24%, $p=0.09$). Subgroup analysis showed that the predictive value of ANC is influenced by choice of concurrent chemotherapy agent. In patients receiving concurrent non-PT, ANC $>$ 3.9 predicted for worse 5-year OS (25% vs 57%, $p=0.024$) and 5-year DFS (4% vs 30%, $p=0.022$). This relationship was not seen for concurrent PT.

Conclusion: Higher post-treatment ANC is predictive of poorer survival in primary non-metastatic esophageal cancer patients who have received tri-modality therapy, and this effect is influenced by choice of concurrent chemotherapy agent. Further investigation could consider individual neutrophil subpopulations, how they are affected by different treatment regimens, and their roles in cancer progression.

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Survival and Complications after Neoadjuvant Chemotherapy or Chemoradiotherapy for Potentially Resectable Esophageal Cancer: A Meta-analysis

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Purpose/Objective(s): Chemotherapy (CT) and chemoradiotherapy (CRT) are both standard treatments for potentially resectable esophageal cancer. The purpose of this meta-analysis is to identify the most effective approach through comparison of the benefits of survival and incidences of complications between received CT and CRT esophageal cancer patients.

Materials/Methods: A systematic literature search was conducted using PubMed, the Ovid database and Google Scholar as research sources from January 1980 to the present. Data includes 5-year and 3-year survival rates, the pathological complete response (PCR) rate, R0 resection rate, mortality rates. Complications of postoperative (respiratory, anastomotic, fistula, chylothorax and cardiovascular) and preoperative (myelo-suppression and gastrointestinal) side effects were extracted and analyzed.

Results: 3 randomized trials and 9 retrospective studies were completed, which included 1086 patients who received CT and 1219 patients who received CRT. Meta-analysis showed that neoadjuvant CRT significantly increased the 3-year and 5-year survival rates (risk ratio (RR) $=1.15$ 95% (confidence interval) CI 1.05−1.25 $P = 0.002$; RR: 1.22, 95% CI 1.03−1.45 $P = 0.02$, respectively). There was also a higher R0 resection (88.4% VS 78.5%, RR: 1.01, 95% CI 1.03−1.18, $P = 0.004$) and PCR rate (21.6% VS 5.7%, RR: 3.87, 95% CI 2.95−5.13, $P < 0.00001$) in CRT when compared to CT. Further analysis showed that induction of CRT postoperative mortality and cardiovascular complication were higher than CT alone (6.3% VS 2.8%, RR: 2.45, 95% CI 1.59−3.78, $P < 0.0001$; 18.6% VS 15.6%, RR: 1.31, 95% CI 1.06−1.62, $P=0.01$) . Postoperative (respiratory, anastomotic, fistula, and chylothorax) and preoperative complications (myelo-suppression and gastrointestinal) were not significantly increased.

Conclusion: This meta-analysis shows induction of CRT could provide a longer survival benefit, higher R0 resection, and PCR rates than CT. However, the incidence of postoperative mortality and cardiovascular complication must be decreased in further research.

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Is the Time between Surgery and Radiochemotherapy an Important Factor for Local Control in Locally Advanced Gastric Cancer

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Purpose/Objective(s): To evaluate the effect of time between surgery and adjuvant radiochemotherapy (RCT) on local disease control in patients with locally advanced gastric cancer (LAGC).
Materials/Methods: This retrospective study consisted of 190 patients who underwent radical gastrectomy (R0) for gastric cancer from October 2001 to April 2018. All patients underwent total or subtotal gastrectomy and D2 lymph node dissection. Then, all patients underwent adjuvant concurrent RCT with infusion 5-FU / oral capecitabine and 5-FU-based chemotherapy. External beam radiation therapy was delivered total dose 4500 cGy in 25 fractions with 3D-conformal or volumetric modulated arc therapy (VMAT) technique. The effect of time between surgery and RCT on local control was evaluated. The Kaplan Meier and Log-Rank analysis were used to identify significance.
Results: The median follow-up time was 29 (4-202) months. The median age was 58 (24-84) years and 70% of the patients were male. The tumor locations were corpus (49%), antrum (34%), cardia (14%), and linitis plastica (3%). Total gastrectomy was performed in 59% patients while 41% patients had subtotal gastrectomy. According to AJCC 2017-TNM staging system, the stage distribution of patients were stage IIa in 13%, stage IIb in 18%, stage IIIa in 29%, stage IIIb in 32% and stage IIIc in 9%, respectively. The most common histopathology was adenocarcinoma (76%). The lymphovascular and perineural invasion were present in 66% and 64% of patients, respectively. The median time to the beginning of RCT after surgery was 133 (29-239) days. In 34% patients adjuvant RCT was started in the first 120 days after surgery. The 2 and 5 year local recurrence-free survival (LRFS) rates were 91% and 87% in all patients, 96% and 96% in time $<$120 days between surgery and RCT while 88% and 82% in time $\geq$120 days ($p=0.022$). The overall (OS) and disease-free survival (DFS) rates were 72% and 65% at 2 years, 51% and 55% at 5 years, respectively. The time were not found as a statistically significant factor for OS ($p = 0.947$) and DSF ($p = 0.537$).
Conclusion: Local disease control is an important issue in LAGC and delay of more than 120 days in the beginning of adjuvant radiochemotherapy after surgery may cause loss of LRFS up to 14%. Therefore, the time to start RCT after surgery in the first 120 days as an important factor for local control should consider.
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Clinical Outcomes and Patterns of Failure after D2 Gastrectomy and Adjuvant Chemoradiotherapy in Patients with Locally Advanced Carcinoma Stomach: A Retrospective Review From A Tertiary Care Cancer Research Institute

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Purpose/Objective(s): Surgery is the primary curative approach for Gastric cancer. However, even after radical resection, overall prognosis remains dismal with increased locoregional and/or metastatic recurrences. Role of adjuvant chemoradiation after D2 gastrectomy has been widely investigated and has been found to have a modest survival advantage. The present study was conceived with the aim of reviewing gastric cancer data from our institute, in terms of clinical outcomes, patterns of failure and survival after D2 gastrectomy and adjuvant chemoradiation.
Materials/Methods: This was a single institute retrospective study of all gastric adenocarcinoma patients who underwent D2-gastrectomy, along with either perioperative/adjuvant chemotherapy (CT) or adjuvant chemoradiation (CTRT). All such patient records between January 2010 and December 2017 were included. Comparison was made between the two treatment arms in terms of patient and disease characteristics, clinical outcomes including overall and recurrence free survival (RFS) and pattern of failure.
Results: A total of 190 patient records were reviewed in the present study. There was an overall male preponderance, with median age at diagnosis of 56 years. Distal stomach was the commonest site of disease (65% cases in Antropyloric region). Histopathological examination revealed Stage III disease in majority of the patients (57%). Adjuvant treatment in the form of chemoradiation and chemotherapy was given to 57% (110/190) and 43% (80/190) patients respectively. Nearly one fourth of all patients [24%] developed subsequent recurrence following treatment; 73% of those who suffered recurrences (34/46) had local recurrences, 27% (12/46) failed distally. Lymph nodes were the most common sites of local failure accounting for 53% (23/46) and liver the most common site of isolated distal failure 7% (3/46) followed by lung and bone (4% each).Median follow up was 41 months (4-105 months). Local recurrence was significantly lower in CTRT group as compared to CT alone (15.4% vs. 36.2%; $p =0.001$). Distant metastasis was also significantly lower in CTRT than CT alone (6.3% vs. 20.0%; $p = 0.001$). The OS and RFS at 94 months was 75% and 88% respectively. Adjuvant chemo-radiation was associated with a statistically significant improvement in RFS 79% vs. 62% ($p = 0.001$) and showed a trend towards improved OS 77% vs. 65% ($p = 0.07$).
Conclusion: Adjuvant chemoradiation after D2 gastrectomy has shown significant improvement in locoregional control with a modest trend towards improved OS. Our results are encouraging and comparable to published literature; It should be further evaluated in a prospective study.
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IMRT Reduces Acute Toxicity in Patients Treated with Preoperative Chemoradiation for Gastric Cancer

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Purpose/Objective(s): Two large randomized trials are currently investigating preoperative chemoradiation for localized gastric adenocarcinoma. However, radiation therapy (RT) can be associated with relatively high rates of acute toxicity. Newer techniques, such as intensity modulated RT (IMRT), could reduce toxicity by reducing radiation dose to normal structures. Our goal was to compare rates of toxicity, toxicity-related events, and oncologic outcomes in patients treated with IMRT compared to 3D conformal RT (3DCRT).
Materials/Methods: The records of 202 gastric cancer patients treated with preoperative intent RT at our institution from 1998-2018 were retrospectively reviewed. Demographic data, treatment details, acute and late toxicities (CTCAE 4.0), progression and survival data were recorded. Patients who had stage IV disease were excluded. Statistical analysis included descriptive statistics, Cox regression analysis, and Kaplan-Meier survival.
Results: 54% were male, and the median age was 63. 82 patients received 3DCRT and 120 patients received IMRT. The median radiation dose was 45Gy (IQR: 45-45 Gy). 78% of patients in the 3DCRT group and 95% of patients in the IMRT group received neoadjuvant chemotherapy prior to RT ($p=0.001$). 99% of patients in both groups received concurrent chemotherapy. There were no significant differences between the 3DCRT and IMRT groups with respect to gender, race, histology, tumor, or nodal