DISEASES OF THE ESOPHAGUS

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Abstract Supplement

20 TREATMENT OPTIMIZATION AND PROGNOSTIC FACTORS IN ADVANCED ESOPHAGEAL CANCER

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Esophageal cancer is a disease with high mortality due to advanced stage at the time of diagnosis in patients with poor general condition and/or multiple comorbidities which makes them unsuitable for radical treatment. The goal of this clinical trial is finding optimal treatment for this group of patients.

Methods. Hypothesis of this clinical trial is that sequential use of high dose rate intraluminal brachytherapy, external beam radiotherapy and chemotherapy decreases symptoms of disease, improves quality of life and prolongs overall survival in patients with esophageal cancer that are not candidates for radical treatment.

We have included patients with esophageal cancer that are not candidates for radical treatment. Statistical analysis was done only for the patients that have completed planned treatment and not for the intent to treat population. Therefore, statistical analysis was done for 39 patients, 22 in control group and 17 in interventional group.

Results. In a survival analysis adapted for AJCC stage of the disease, addition of sequential chemotherapy improves overall survival statistically significant (P = 0.004). Sequential use of high dose rate intraluminal brachytherapy and external beam radiotherapy decreases the degree of: dysphagia (P = 0.001), odynophagia (P = 0.002) and regurgitation (P = 0.008) statistically significant. Decrease of a pain degree is statistically significant only with the use of sequential chemotherapy (P = 0.031). Sequential use of chemotherapy does not improve control over dysphagia (P = 0.872), odynophagia (P = 0.872) and regurgitation (P = 0.872) any further. Patients of female gender have greater improvement of regurgitation score (P = 0.068), pain score (P = 0.09) and quality of life (P = 0.019).

Conclusion. Sequential use of high dose rate intraluminal brachytherapy and external beam radiotherapy provides a safe use of high radiotherapy doses with minimal exposure of organs at risk, according to dose-volume histogram analysis. Sequential use of chemotherapy, after high dose rate intraluminal brachytherapy and external beam radiotherapy, improves overall survival in patients with esophageal cancer that are not candidates for radical treatment, in comparison to patients who do not receive chemotherapy (P = 0.09).

26 PREDICTION OF PREOPERATIVE CHEMOTHERAPY FOR ESOPHAGEAL CANCER USING ARTIFICIAL INTELLIGENCE

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Currently, preoperative chemotherapy is usually done for advanced esophageal cancer according to guidelines. It is still difficult to predict the effect of chemotherapy before the chemotherapy. If the effect would be poor, the patient may miss the possibility of treatment. We have been examining the possibility of predicting the chemotherapy effect based on test results before and during chemotherapy. In this study we used artificial intelligence to predict the effect of chemotherapy.

Methods. 80 patients who underwent preoperative chemotherapy for esophageal cancer in our department from 2012 to 2019. We predict the chemotherapy effect according to age, sex, type of chemotherapy (FP/DCF), number of chemotherapy, T, M, N, blood examination results before chemotherapy as WBC, neutrophil count, lymphocyte count, hemoglobin, platelets, total protein, Albumin, CRP, IgG, IgA, IgM, IL6, creatinine, lowest WBC, neutrophil and lymphocyte count, during chemotherapy. The effect of chemotherapy was classified: CR, PR, and PD. Prediction were performed using MatLab R2019b classification learner and Neural Net Pattern Recognition.

Results. The actual effect was CR/PR/SD/PD = 0/33/42/5 cases. The correct answer rate was 66.3% for the optimized tree model, 66.3% for the optimized Naïve Bayesian model, 67.5% for the optimized SVM model, and 56.3% for the optimized ensemble model. With optimized SVM, the sensitivity to predict PD was 20%, specificity was 94.5%, and AUC was 0.83. Moreover, the sensitivity to predict PR was 75.8%, and the specificity was 76.6%. With Neural Net Pattern Recognition, the correct answer rate was 90%, and the sensitivity to predict PD was 20%, specificity was 94.7%.

Conclusion. In this study, Neural Net Pattern Recognition as a deep learning model could predict the effect of preoperative chemotherapy more accurately than that of classification learner. The poor prediction of PD was due to the small number of teacher models, and the prediction of PR with many teacher models was more accurate. We will add more teacher models, and establish a prediction model that can be used clinically for both sensitivity and specificity.

33 CRISCO-UGIS: COMPOSITE RISK SCORE TO PREDICT POST-OPERATIVE COMPLICATIONS FOR UPPER GASTROINTESTINAL CANCER SURGERY

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Gastroesophagectomy for cancer is associated with high risk of morbidity and mortality. Careful patient selection for surgery is essential for optimizing outcomes. The purpose of this study was to develop a reliable composite risk calculator to inform pre-operative decision-making using readily available patient and tumour characteristics.

Methods. Patients undergoing curative-intent resection for gastroesophageal cancer from January 2010 to December 2018 were identified from a prospectively collected database. Data were verified and collected from patients' medical records. Multiple logistic regression modeling identified pre-operative variables associated with significantly elevated risk of moderate to severe post-operative complications (Clavien-Dindo score ≥ 2) within 30 days of

Table 1. Risk factors for developing moderate-severe post-operative complications (Clavien-Dindo score ≥ 2.

	OR [95% CI]	β	CRISCo-UGIS (β x 2)
Female sex	1.97 [1.07-3.62]*	0.68	1
CCI ≥5	1.88 [0.89-4.00]*	0.64	1
Albumin < 35 g/L	1.71 [0.92-3.20]*	0.54	1
ECOG performance status 2-3	3.63 [1.47-8.98]*	1.29	3
Proximal-Mid Esophagus tumour	3.06 [1.21-7.71]*	1.12	2
Distal Esophagus and GEJ tumour	1.58 [0.90-2.77]*	0.46	1

*statistically significant result $p < 0.05$.
β, beta coefficient; CCI: age-adjusted Charlson comorbidity index; CI: confidence interval; ECOG: Eastern Cooperative Oncology Group; GEJ: gastroesophageal junction; OR: odds ratio; ref: reference group.