Automatic Multimodal Classification Using Transformer for Cervical Cancer

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Objectives In cervical cancer diagnosis, automatic classification and identification can effectively reduce the workload of radiologists and gynecologists. Due to that T2-MR and DWI-MR images are complementary in lesion information, it is necessary to combine medical images with the two modalities. In this study, we proposed a automatic classification pipeline for cervical cancer based on Swin-Transformer and verified the classification potential on multimodality.

Methods Fifty-eight T2-MR images and eighty DWI-MR images of patients with cervical cancer were retrospectively enrolled. Totally 1858 slices were annotated by radiologists to four classes, including T2-tumor, T2-notumor, DWI-tumor and DWI-notumor. 1489 slices were used for training and 369 images for validation. In addition, images of ten patients containing 184 DWI slices and 200 T2 slices were not participated in modeling as test set. All the gray slices(512×512) with single channel were repeated to three channels and resized to 224×224 pixels. Finally, the mixed 1858 slices(892 DWI, 966 T2) were put into the classification network based on Swin-Transformer (optimizer: AdamW , batchsize = 8, lr = 0.0001).

Results Four typical metrics were applied to evaluate the classification result, including accuracy, F1-score, sensitivity and specificity. Regarding to the 184 DWI test slices, the accuracy, F1-score, sensitivity, specificity were 91.85%, 90.15%, 88.52% and 93.50%, respectively. And the accuracy of 200 T2 test slices was 83.00%. Besides, there was no error in the distinction between the two modalities.

Conclusions This work confirmed that the tumor of cervical cancer on multimodal MRI images can be automatically classified with high accuracy.

Evaluation of Lymphedema After Treatment of Cervical Carcinoma: Hospital-based Study

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Objectives Background: Lower limb lymphedema following treatment of cervical cancer is a significant cause of morbidity and has a negative impact on quality of life. Lymphedema presents typically within the first 12 months post-treatment. With appropriate preventive therapy and education quality of life in cancer survivor will be better. Objective: To evaluate the incidence, risk factors and treatment modalities in cervical carcinoma patients with lymphedema and impact of lymphedema symptom on their quality of life.

Methods This observational study was conducted in gynae oncology department of National Institute of Cancer Research and Hospital, Dhaka in between 2018–2020. Total 3164 cervical carcinoma patients were attended in GOPD and treated either by surgery or radiotherapy. Patient who died of cancer or lost in follow up were excluded. The International Society of Lymphology staging of lymphedema severity used as a diagnostic criteria for lower limb lymphedema.

Results During follow up 189 cervical cancer patients (9.95%) were diagnosed with lymphedema. Lymphedema were more prevalent (74.04%) among patients underwent surgery with adjuvant radiotherapy. In 42.32% patients bilateral pelvic lymphadenectomy was done. Lymphedema was present in 33.86% patients in both legs. 40.8% patients present with numbness in lower limb followed by tightness(22.5%) and limited movement of knee (21.1%). Among them 63% patient was anxious, 55% was depressed and sexual dysfunction was present in 35% cases.

Conclusions Lymphedema is a significant morbidity among cervical cancer survivor. Unfortunately, there is no consensus about a uniform evaluation. Standarization in lymphedema evaluation is required to better compare the outcome of different types of treatment.