IGCS19-0135

28 DEEP LEARNING BASED CYTOLOGY NEGATIVE SAMPLE SCREENING METHOD

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Objectives We show that deep learning can be used to create high accuracy cells classifiers that can support cytologists in their work.

Two deep learning models are presented. The first model is used for cervical cancer cytology negative/positive prescreening and we show its high specificity at 100% Negative Predict Value (NPV). The second model is used to predict among 15 categories common to cervical analysis, as listed in figure 1(b).

Our classifiers include Grad-Cam visualizations that show both models concentrate on relevant areas of images.

Methods Classifiers are based on deep convolutional networks. The crucial aspects in achieving high accuracy are data augmentation and focal loss.

Grad-Cam visualizations are used to explain models' reasoning.

(a)

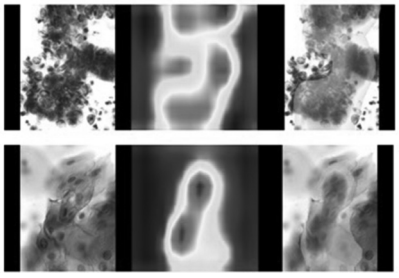
		Actual Values	
		Positive	Negative
Predicted Values	Positive	458	37
	Negative	0	405

(b)

class	validation_accuracy
Cervical columnar cell	95.49%
Histiocyte	91.35%
Menopausal	95.81%
Premenopausal	98.64%
Endometrial columnar cell	91.84%
Squamous metaplasia	94.85%
Inflammatory change	97.78%
Senile colpitis	98.20%
Trichomonas infection	97.25%

class	validation_accuracy
Candia Infection	98.25%
Herpes Infection	89.00%
ASC-US / LSIL	90.87%
ASC-H / HSIL	75.80%
SCC	70.21%
AGC / Adenocarcinoma	81.59%

(c)



Abstract 28 Figure 1 (a) Confusion matrix of prescreening model; (b) Accuracy of 15 categories classification model; (c) Grad-Cam visualizations

Results Prescreening model, based on 2700 samples, achieves 95.89% overall accuracy and 91.62% specificity at 100% NPV (figure 1(a)) ; second stage screening model, based on approximately 9500 samples, achieves 92.03% overall accuracy (figure. 1(b)). Grad-Cam visualizations show that both models concentrate on relevant areas of the image when making predictions (figure. 1(c)).

Conclusions We show that deep learning based classifiers can be useful in supporting cytologist in their work. Approximately 92% of samples that cytologist screen for cervical cancer are negative. With our model cytologists can concentrate their efforts on only positive samples and a small number of false positives predictions.

IGCS19-0150

29 E6-P53 AND E7-RB CO-MEDIATED HIGHER CARCINOGENIC ABILITY OF HPV16 THAN HPV58 IN CERVICAL CANCER

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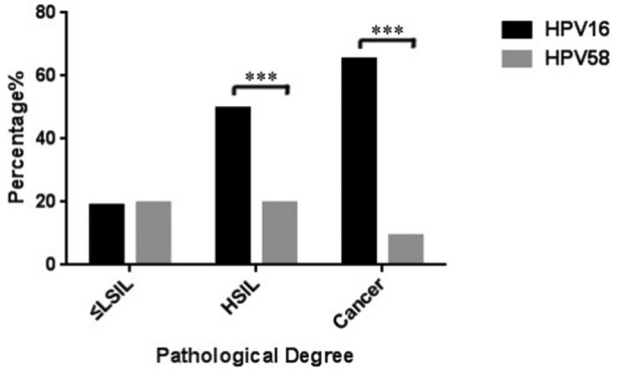
Objectives HPV16 presents most frequent infection and most powerful carcinogenic capacity in human cervix. HPV58 is more common in Asian women. The mechanism of HPV16 gaining higher carcinogenic ability than HPV58 is still unknown.

Methods We collected 4030 cervical exfoliated cell samples in our hospital. All the samples did HPV genotyping using HybriBio's proprietary flow-through hybridization technique and liquid-based cytology (LBC), and if necessary colposcopy-guided quadrant biopsies. Four plasmids containing E6 and E7 of HPV 16 and 58 were constructed and transfected into 293T and U2OS cells, respectively. Cell cycle, apoptosis, proliferation and invasion were detected by FCM, CCK8 detection and transwell assay, respectively. E6-P53 and E7-pRB co-expression and co-localization were detected by western blot and confocal immunofluorescence.

Results We found that the percentage of HPV16 in ≤LSIL group was 18.9% while HPV58 was 19.7%; HPV16 in HSIL group was 49.5% while HPV58 was 19.6%; HPV16 in cancer group was 65.3% while HPV58 was 9.0%. The proportion of early apoptosis in 293T cells with HPV58 E6/E7



Abstract 29 Figure 1

overexpression (293THPV58over) was 7.9% and 6.85%, while 4.4% and 3.99% in 293THPV16over (all P<0.05), respectively. S phase was 42.68% and 45.36% in 293THPV58over, while 52.66 and 52.7% in 293THPV16over (all P<0.05). Moreover, decreased P53 and increased pRB expression in the nuclear was observed in 293THPV16over compared with 293THPV58over. Similar results were observed in U2OS cells.

Conclusions Our findings identified E6-P53 and E7-Rb co-mediated HPV16 gained higher carcinogenic ability than HPV58 in cervical cancer.

IGCS19-0759

30 EVOLUTION AND OUTCOMES OF SENTINEL LYMPH NODE MAPPING IN VULVAR CANCER

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Objectives We sought to characterize our experience with SLN biopsy in patients with vulvar cancer, focusing on the modality of SLN detection.

Methods We performed a retrospective analysis of patients who underwent inguinofemoral SLN biopsy for vulvar cancer at Memorial Sloan Kettering Cancer Center from 1/1/2000–4/1/2019. An "at-risk groin" was defined as the inguinofemoral lymph nodes from either the right or left groin for which SLN biopsy was performed. Pearson's Chi-Squared test was used for comparison of categorical variables.

Results 160 patients were included, representing 265 at-risk groins. Demographic and pathologic features are summarized in the table 1. Patients underwent mapping with a combination of Technicium-99 radiocolloid injection (TC-99), blue dye injection, or near-infrared imaging with indocyanine green (ICG) injection. SLN detection rate, irrespective of modality, was 96.2%. TC-99 + Blue dye detected SLNs in 91.8% of groins, and TC-99 + ICG detected SLNs in 100% of groins (p = 0.157). The use of ICG alone resulted in an SLN detection rate of 96.3% (26/27). Among the 110 groins that underwent mapping with TC-99 and blue dye, 4 patients mapped with TC-99 alone (3.6%). Among the 96 groins that underwent mapping with TC-99 and ICG, 14 mapped with ICG alone (14.6%).

Conclusions The use of ICG for inguinofemoral SLN mapping has increased over the past decade and is associated with the highest rates of SLN mapping of any modality.

Abstract 30 Table 1

		Number of Patients (Total = 160)	Number of at-risk groins (Total = 265)	P
Race	Black	10 (6.3%)	17 (6.4%)	< 0.001
	White	140 (87.5%)	234 (88.3%)	
	Asian	4 (2.5%)	5 (1.9%)	
	Declined to Answer	6 (3.8 %)	9 (3.4%)	
Histology	Squamous Cell	114 (71.3%)	195 (73.6%)	< 0.001
	Melanoma	38 (23.8%)	60 (22.6%)	
	Paget's Disease (Adenocarcinoma)	4 (2.5%)	6 (2.3%)	
	Yolk Sac Tumor	1 (0.6%)	1(0.4%)	
	Sarcoma	2 (1.3%)	2 (0.8%)	
	Basal Cell Carcinoma	1 (0.6%)	1 (0.4%)	
SLN Modality	TC-99 alone	2 (1.3%)	2 (0.8%)	< 0.001
	Blue dye alone	2 (1.3%)	3 (1.1%)	
	ICG Alone	18 (11.3%)	27 (10.2%)	
	TC-99 + Blue Dye	71 (44.4%)	110 (41.5%)	
	TC-99 + ICG	51 (31.9%)	96 (36.2%)	
	TC-99 + Blue Dye + ICG	14 (8.8%)	25 (9.4%)	
	ICG + Blue	2 (1.3%)	3 (1.1%)	
SLN Detection Rate	TC-99 alone		2/2 (100%)	0.134
	Blue dye alone		3/3 (100%)	
	ICG Alone		26/27 (96.3%)	
	TC-99 + Blue Dye		101/110 (91.8%)	
	TC-99 + ICG		96/96 (100%)	
	TC-99 + Blue Dye + ICG		24/25 (96%)	
	ICG + Blue		3/3 (100%)	

IGCS19-0480

31 SURGICAL CYTOREDUCTION IN ADVANCED STAGE SEROUS ENDOMETRIAL CARCINOMA

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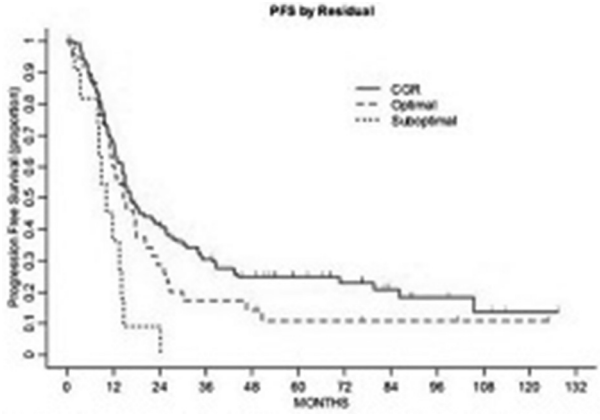
Objectives To evaluate oncologic outcomes in patients with advanced-stage serous endometrial cancer treated with upfront surgical cytoreduction.

Methods We retrospectively identified patients with newly diagnosed Stage III or IV serous endometrial cancer treated with upfront surgery from 1/2005–12/2015. Patients treated with upfront chemotherapy (CT) were excluded. Appropriate statistics were performed.

Results 169 pts were included; 97(57%) Stage III, 72 (43%) Stage IV. 108 (64%) underwent open surgery, 61(36%) minimally invasive surgery. All had hysterectomy/bilateral



Abstract 31 Figure 1 Progressive free in months by amount of residual disease at time of primary surgery