Brush cytology for the detection of high-risk HPV infection in oropharyngeal squamous cell carcinoma

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BACKGROUND
High-risk human papillomavirus (HR-HPV) infection is associated with improved prognosis and a better response to treatment in patients with oropharyngeal squamous cell carcinoma (OPSCC). Brush cytology is a noninvasive method with which to collect cells from the surface of mucosal lesions. The objective of the current study was to assess the performance of OPSCC brush cytology for the detection of HR-HPV.

METHODS
Liquid-based brush cytology specimens were prospectively collected during panendoscopy from 51 patients with OPSCC. Cell suspensions were analyzed with Papanicolaou staining, polymerase chain reaction-based HPV DNA testing, and p16 immunostaining. HPV testing and p16 staining were also performed on paired OPSCC biopsy or surgical resection specimens. The detection of HR-HPV DNA alone and the combined positivity for HR-HPV DNA and p16 protein in dysplastic squamous cells were used to calculate accuracy, sensitivity, specificity, and positive and negative predictive values for HR-HPV detection using brush cytology samples.

RESULTS
Approximately 96% of OPSCC brush cytology samples (49 of 51 samples) were classified as satisfactory for evaluation. Dysplastic squamous cells were found in 88% of samples (43 of 49 samples). HPV DNA testing was conclusive in 95% of samples (41 of 43 samples) and revealed HR-HPV DNA in approximately 54% of patients (22 of 41 patients) (HPV type 16 in 19 patients and HPV type 33 in 3 patients). Approximately 49% of brush cytology samples (20 of 41 samples) were positive for HR-HPV DNA and p16 expression. The accuracy, sensitivity, specificity, positive predictive value, and negative predictive value of brush cytology to identify HR-HPV DNA-positive and p16-positive OPSCC samples were 88%, 83%, 94%, 95%, and 81%, respectively.

CONCLUSIONS
Brush cytology appears to be a valid approach with which to determine the HR-HPV status of patients with OPSCC. Cancer (Cancer Cytopathol)