Transepithelial evaluation as an oral lesion surgical biopsy timing instrument

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ABSTRACT

Methods: Oral cancer affects approximately 36,000 people in the U.S. a year and the mortality rate has not changed in the last 40 years. Because of the poor survival rate of oral cancer, optimal management involves the detection of dysplasia.

Multiple factors associated with a scalpel biopsy make it undesirable for the evaluation of oral mucosal lesions. A scalpel biopsy is an invasive procedure associated with potential complications, pain or discomfort, stress, recovery time and expenses. For these reasons, the choice to schedule an immediate surgical biopsy of an oral mucosal lesion is reserved for those cases with a sufficiently high index of suspicion that a neoplastic process is present. Patients at low risk with innocuous-appearing lesions may instead be managed with periodic reevaluation or, in some cases, rescheduled only as needed. This study investigated the utility of a minimally invasive technique of pathologic evaluation of oral mucosal lesions, for the detection of dysplasia and/or early oral cancer. The information obtained could assist in elevating the doctor’s concern for the lesion and therefore may choose to perform an immediate scalpel biopsy as opposed to patient observation. The transepithelial brush biopsy, which has been proven in multiple studies to have a sensitivity and specificity of greater than 90%, was employed as the screening tool. Where transepithelial brush biopsy revealed presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Transepithelial brush biopsy from suspicious lesions provides information to aid in determining the treatment pathway for suspicious oral mucosal lesions not meeting criteria for immediate surgical biopsies.

RESULTS

In the study period, 52 patients had brush biopsies performed from 2008-2011. Of these patients, 48,000 brush biopsies were performed. The brush biopsy was made available to patients to provide the doctor with potentially useful pathological information before the decision to perform a scalpel biopsy or to continue observation. Ideally, this tool might provide sufficient information to reduce the number of patients ultimately requiring a surgical biopsy as well as help identify dysplastic lesions at an early stage. For cases identified as suitable for evaluation by the brush biopsy, the doctor educated the patient on the transepithelial brush biopsy procedure, and obtained the specimen. The brush biopsy procedure is done by placing the transepithelial brush lesion, rotating until a brush red or pinpoint bleeding is obtained, transferring the specimen to a slide, and applying a fixative. The slide is stained by a histological technician, and then scanned by a digital analyzer using an algorithm for detection of abnormal cells. The slides and output of the digital analysis are then reviewed by specialized pathologists to identify abnormal or dysplastic cells. A report is then issued to the clinician indicating either presence or absence of abnormal or dysplastic cells. If abnormal cells are detected, a specialist from the laboratory contacts the doctor with specific feedback. The brush biopsy result is then used by the doctor to perform either an immediate surgical biopsy or to observe the patient. The slides and output of the digital analysis are then reviewed by specialized pathologists to identify abnormal or dysplastic cells. A report is then issued to the clinician indicating either presence or absence of abnormal or dysplastic cells. If abnormal cells are detected, a specialist from the laboratory contacts the doctor with specific feedback. The brush biopsy result is then used by the doctor to perform either an immediate surgical biopsy or to observe the patient. The slides and output of the digital analysis are then reviewed by specialized pathologists to identify abnormal or dysplastic cells. A report is then issued to the clinician indicating either presence or absence of abnormal or dysplastic cells. If abnormal cells are detected, a specialist from the laboratory contacts the doctor with specific feedback. The brush biopsy result is then used by the doctor to perform either an immediate surgical biopsy or to observe the patient.

Dysplastic cells were identified as abnormal cells that meet criteria for immediate surgery. For these patients, the surgical biopsy was performed earlier in time, eliminating the wait for additional observational follow up period. Waiting additional time, may have allowed a dysplastic lesion to advance.

Additional findings of the brush biopsy such as the presence of fungal organisms, also proved useful in the evaluation of lesions and making treatment decisions.

DISCUSSION

Transepithelial brush biopsy revealed presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Where transepithelial brush biopsy revealed pathological findings of cancer or dysplasia, the doctor might provide sufficient information to reduce the number of patients ultimately requiring a surgical biopsy as well as help identify dysplastic lesions at an early stage. For cases identified as suitable for evaluation by the brush biopsy, the doctor educated the patient on the transepithelial brush biopsy procedure, and obtained the specimen. The brush biopsy procedure is done by placing the transepithelial brush lesion, rotating until a brush red or pinpoint bleeding is obtained, transferring the specimen to a slide, and applying a fixative. The slide is stained by a histological technician, and then scanned by a digital analyzer using an algorithm for detection of abnormal cells. The slides and output of the digital analysis are then reviewed by specialized pathologists to identify abnormal or dysplastic cells. A report is then issued to the clinician indicating either presence or absence of abnormal or dysplastic cells. If abnormal cells are detected, a specialist from the laboratory contacts the doctor with specific feedback. The brush biopsy result is then used by the doctor to perform either an immediate surgical biopsy or to observe the patient.

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METHODOLOGY

Objectives: For patients with certain risk factors and/or when oral mucosal lesions are not meeting criteria for immediate surgical biopsy, we evaluated the use of a transepithelial brush biopsy as a screening tool to assist in choosing between different treatment options for immediate surgical biopsy and patient observation.

Methods: Transepithelial oral mucosal brush biopsy was performed on patients with risk factors and mildly suspicious oral mucosal lesions. Specimens were obtained by a clinician using a conventional oral biopsy instrument from 2008-2011. We correlated the results with the follow up treatment decisions.

RESULTS

During the study period, 52 patients had brush biopsies performed. The samples were collected, processed, interpreted and reported according to the study methodology.

In 71% of cases, results revealed no evidence of abnormal cells and patients were put under observation with a follow up visit to the doctor. In 21% (p<0.01) of cases, results revealed abnormal or dysplastic cells and the doctor contacted the patients to inform them, and to schedule an immediate follow up surgical biopsy. In 7% of cases fungal infection was identified, and patients were treated accordingly.

CONCLUSIONS

Where transepithelial brush biopsy revealed presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Transepithelial brush biopsy from suspicious lesions provides information to aid in determining the treatment pathway for suspicious oral mucosal lesions not meeting criteria for an immediate surgical biopsy. Transepithelial brush biopsy reveals presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Transepithelial brush biopsy from suspicious lesions provides information to aid in determining the treatment pathway for suspicious oral mucosal lesions not meeting criteria for an immediate surgical biopsy. Transepithelial brush biopsy reveals presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Transepithelial brush biopsy from suspicious lesions provides information to aid in determining the treatment pathway for suspicious oral mucosal lesions not meeting criteria for an immediate surgical biopsy. Transepithelial brush biopsy reveals presence of abnormal or dysplastic cells an immediate follow up scalpel biopsy was recommended. Transepithelial brush biopsy from suspicious lesions provides information to aid in determining the treatment pathway for suspicious oral mucosal lesions not meeting criteria for an immediate surgical biopsy.