



COMPARISON OF SCRAPE CYTOLOGY AND HISTOPATHOLOGY IN ORAL CAVITY AND OROPHARYNGEAL MALIGNANCY

Otolaryngology

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ABSTRACT

Oral cavity and Oropharyngeal squamous cell carcinoma accounts for more than 40% cancers in India. Exfoliative cytology by using scrape method has been shown to be an efficient diagnostic method, particularly in the more advanced stages of the disease. This study was done to correlate the findings of scrape cytology & histopathology and to evaluate the utility of scrape cytology for rapid & routine diagnosis of malignancy. Ninety four patients with suspected oral cavity or oropharyngeal carcinoma were included in the study. Scrape sample was stained using Papanicolaous method and the histological sections were stained with hematoxylin and eosin. Diagnostic validity of Scrape cytology was compared with histopathology and was expressed in terms of sensitivity, specificity, positive predictive value and negative predictive value. It was seen that even though scrape cytology is used for identifying atypical cells and has almost comparable diagnostic validity with histopathological examination, it cannot be substituted for the same owing to its decreased sensitivity.

KEYWORDS

Scrape Cytology, Histopathology, oral cavity lesions, Oropharyngeal Carcinoma

INTRODUCTION

Oral cavity and Oropharyngeal squamous cell carcinoma is the 6<sup>th</sup> most common malignancy in western world & accounts for more than 40% cancers in India<sup>(1)</sup>. This study is conducted to find out the efficacy of oral scrape smear as a screening tool for detecting oral cavity and oropharyngeal carcinoma. Even though histopathological examination remains gold standard for diagnosing malignancy, obtaining a sample through biopsy is invasive and technically difficult<sup>(2)</sup>. Scrape cytology, being a simple, inexpensive, minimally invasive, risk free procedure, has a better patient compliance. This study is conducted to find out the efficacy of oral scrape smear as a screening tool for detecting oral cavity and oropharyngeal carcinoma.

AIM OF STUDY

- To correlate findings of scrape cytology & histopathology
- To evaluate the utility of scrape cytology for rapid & routine diagnosis of malignancy

MATERIALS AND METHODS

This study was conducted in Department of Otorhinolaryngology, Government Medical College Thrissur, Kerala from January 2015 to December 2015. Sample size was calculated according to the formula,  $N = \frac{\text{True positive} + \text{false negative}}{\text{prevalence}} = \frac{43+4}{0.5} = 94$ <sup>(3)</sup>. So, 94 patients who were suspected to have oral cavity or oropharyngeal carcinoma were included in the study. It was a Diagnostic test validation study. Patients above the age of 30 years and both sexes who presented with symptoms & clinical features suggestive of oral cavity & oropharyngeal malignancy were included. Histologically proven cases and Patients with prior history of radiotherapy for head and neck malignancy were excluded.

Following detailed clinical history, ENT examination and systemic examination were done and recorded on a predesigned proforma. Scrape smear of lesions from oral cavity & oropharynx was taken along with biopsy specimen. Scrape smears were stained using Papanicolaou's method. The result was classified as cytologically positive or negative for atypical cells. The histological sections obtained from the patients were stained with hematoxylin and eosin, and analyzed using light microscopy by an examiner.

RESULTS

In the present study, 14 (14.89%) were females and 80 (85.11%) were males.

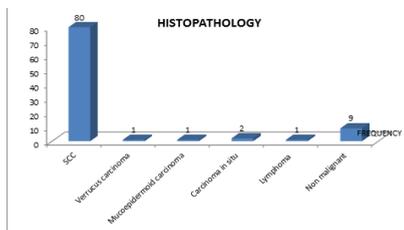


Fig 1

Among 94 cases, 80(85.10) cases were reported as SCC, 1(1.06%) Verrucus carcinoma, 1(1.06%) Mucoepidermoid carcinoma, 2 cases were Carcinoma in situ, 1(1.06 %) Lymphoma, 9(9.57 %) cases no evidence of malignancy (fig 1)

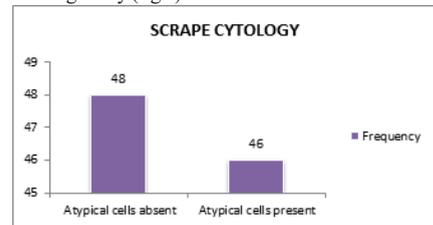


Fig 2

Among 94 cases atypical cells were absent in 48 (51.06%) cases and atypical cells with varying degree of dysplasia was seen in 46(48.94%) cases. (fig 2)

DISCUSSION

Results of this study are compared with similar studies conducted in other places and is shown in table 1 below.

Table 1

Study by	Place	Year	Sample size
Sathish Kumar et al	India- Pondicherry	2011	20
Michele cardoso sousa et al	Brazil	2013	53
Babshet et al	India	2011	35

Male predominance was 80 (85.11%) males and 14 (14.89%) females which is similar to other studies like Sathish Kumar et al, Babshet et al, Michele cardoso sousa et al and Bharati Jha et al<sup>(2)</sup>.

Outcome of This Study (Table 2)

Table 2

Groups	HPE			
	Positive	Negative	Total	
Scrape cytology	Positive	46	0	46
	Negative	39	9	48
	Total	85	9	94

standard error=5.14

Table 3

Validity of test	Percentage (95% confidence interval)	Z=7.4
Sensitivity	54.12(+5.14)	9
	-	

Specificity	100 (+5.14) -	
Positive predictive value of scrape cytology compared to HPE	100(+5.14) -	P=0.006
Negative predictive value of scrape cytology compared to HPE	18.75(+5.14) -	
False negative	45.88(+5.14) -	
False positive	0(+5.14) -	

In 94 cases of lesions suspicious of malignancy, 46 were cytologically positive and Histopathologically positive and 39 patients were cytologically negative and Histopathologically positive. 9 patients

were cytologically and Histopathologically negative with sensitivity of 54.1%. In other studies sensitivity of exfoliative cytology was 91.5% Bharati Jha et al, (Remmerbach et al<sup>(3)</sup>), 76.8- 100% (review of 22 articles by Mehrotra et al<sup>(4)</sup>), 71 to 100 Patton et al<sup>(5)</sup> from various Studies for brush cytology. In this study specificity was 100% which is similar to other studies like study conducted by Bharti Jha et al, Remmerbach et al, 88.9- 100 (review of 22 articles by Mehrotra et al).

In a study done by Michele cardoso sousa et al 86.79% of the cases were found to have malignant potential by cytological analysis. Previous studies that have compared the efficacy of oral exfoliative cytology and histopathology for the diagnosis of malignancy have shown that exfoliative cytology is an effective method<sup>(6)</sup>. But scrape cytology is not routinely used for detection of oral cavity malignancy<sup>(7)</sup>

**Table 4**

Study by	sensitivity	specificity	PPV	NPV	False Positive	False negative	P value
Present study	54.12	100	100	18.75	0	45.88	0.006
Bharti Jha et al	91.5	100	100	66.7	-	25	0.0001
Flosm et al	-	-	-	-	-	37	-
Remmerbach et al	98.2	100	100	99	-	-	-
Mehrotra et al (review of 22 article)	76.8- 100	88.9- 100	-	-	-	-	-
Patton et al Scrape cytology	71 - 100	27 - 94	38-88	60 -100	-	-	-

In this study positive predictive value (PPV) of scrape cytology compared to HPE is 100% which is similar to previous studies like study by Bharati Jha et al, Remmerbach et al. But Patton et al who reviewed several articles which compares exfoliative cytology with HPE found to have varying PPV between 38-88%.

In this study negative predictive value (NPV) is 18.75%. In other studies it was 66.7% (Bharati Jha et al), 99% (Remmerbach et al).

False negative results while comparing with scrape cytology and HPE is 45.88% and false positivity is 0%. In the study done by Bharti Jha et al 25% of cases were false negatives.

Diagnostic validity of scrape cytology is comparable to Histopathology as p value in this study is 0.006 that is similar to study done by Bharti Jha et al with p value 0.0001 which is statistically significant. According to a systematic review by Patton et al, oral cytological test has advantages in detecting dysplastic changes in high risk mucosal lesions but in low risk populations or clinical innocuous lesions its application remains in doubt. This technique cannot be performed in place of surgical biopsy. Since only peripheral cells were taken for scrape cytology, dysplasia lying in deeper layers may be missed compromising the accuracy of the test.

## CONCLUSION

Scrape cytology is a simple, rapid technique for identifying atypical cells and has almost comparable diagnostic validity with histopathological examination, but it cannot be substituted for the same owing to its decreased sensitivity especially in early lesions. Hence it is not reliable for mass screening programs and for routine diagnosis. So irrespective of cytology result we should motivate patients for doing biopsy and HPE in order to make a definitive diagnosis.

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