



Original Article

Evaluation of touch smears cytology and biopsy findings in the diagnosis of gastric carcinoma

Dhakhwa R^{1,2}, Shrestha HG², Joshi DM², Lakhey M¹

¹Department of Pathology, Kathmandu Medical College, Sinamangal, Kathmandu, Nepal

²Department of Pathology, Kathmandu Hospital Pvt. Limited, Tripureswar, Kathmandu, Nepal

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ABSTRACT

Background: Gastric carcinoma is one of the leading causes of cancer deaths worldwide, with a mortality rate directly related to the stage at diagnosis. Endoscopic biopsy and cytology are well established techniques for the diagnosis of carcinoma of stomach.

Materials and Methods: This study was conducted on 50 patients, suspected of gastric cancer on endoscopy, during a period of 18 months (October 2010 to March 2012). Endoscopic biopsy and touch smear cytology were evaluated. Biopsy was considered gold standard for final diagnosis.

Results: A total of 50 cases were included out of which 36 were malignant and 14 cases were benign. Cytology was able to diagnose 33 out of 36 malignant cases. Of 17 cases which were diagnosed as benign on cytology, 3 cases turned out to be malignant on biopsy. The sensitivity and specificity of touch smear cytology are 91.6% and 100% respectively.

Conclusion: Touch smear cytology is a useful adjunct in the diagnosis of gastric carcinoma and should be considered a routine method along with biopsy.

INTRODUCTION

Gastric cancer is one of the most common malignancies of the gastrointestinal tract. In the evaluation of these lesions, the diagnostic value of cytology in addition to biopsy remains controversial. There is wide variability in the reported diagnostic accuracy rates for biopsy and cytology in gastric lesions.¹ Determined efforts in Japan, where the disease is common, have led to remarkable improvements in diagnostic methods.² Today, various cytologic techniques like brush cytology, crush preparation, touch smear cytology etc. are commonly used along with routine endoscopic biopsy.³ There are a few studies in the literature on the

role of touch smear cytology in gastric cancer.^{4,5} On the basis of available data, there is no general consensus as to whether cytology should be done routinely, only in selected instances or not at all. However, the use of touch smear as simple, cheap and rapidly available cytologic technique in under-resourced countries is an added asset to the biopsy.^{1,3}

The aim of the present study was to evaluate the utility and accuracy of touch smear cytology in clinically suspected cases of gastric malignancy with a subsequent correlation with histopathology.

Correspondence:

Dr. Ramesh Dhakhwa, MD
Department of Pathology, Kathmandu Medical College,
Sinamangal, Kathmandu, Nepal
Email: rdhakhwa@gmail.com

MATERIALS AND METHODS

From October 2010 to March 2012, 50 consecutive patients suspected of gastric malignancy were included in this study. On endoscopy, these patients had variable gastric lesions

like mucosal thickening, ulcers, polypoid and ulcerative growths. The site and morphologic appearance of the lesions were recorded. Multiple biopsy samples were taken ranging from 2 to 6 tissue bits. The biopsy samples were transferred from the forceps to two slides with a fine needle, and the smears were then made by gently rotating the tissue with the needle. The touch smears were fixed immediately in 95% propanol for 30 minutes and then stained by Papanicolaou method. The biopsy was subsequently placed in formal saline for histopathologic processing. The histologic sections were routinely stained by hematoxylin and eosin method.

The smears and histologic sections were examined by two pathologists. In touch smears, the cytology slides were classified as positive, suspicious and negative for malignancy.

Positive cytology referred to those cases in which a diagnosis was established by the presence of frankly or unequivocally malignant cells. Suspicion of malignancy was kept in cases having atypical cells, suspicious but not confirmatory for malignancy. Cases that were unequivocally negative or had atypical cells consistent with an inflammatory or reparative process were considered negative. All suspicious cases were categorized as positive for statistical analysis. The data were collected and analyzed using SPSS version 11.0.

Histopathology report was considered gold standard for diagnosis of malignancy. Morphologic characterization and grading of carcinoma was done on histopathology sections.

RESULTS

Among 50 clinically suspicious cases of gastric malignancy, 27 proved to be malignant. It showed malignant cells arranged in papillary pattern. The cells show high NC ratio, moderate amount of cytoplasm and hyperchromatic nucleus with prominent nucleoli (fig.1&2). Six cases were considered suspicious of malignancy on cytology. Both categories of cases with 'definitely malignant' and 'suspicious of malignancy' cytology were grouped under the category of 'positive for malignancy' for statistical evaluation. Sixteen cases were reported as negative for malignancy. In one of the cases, there was excessive drying and crushing artifacts and was considered unsatisfactory for evaluation. However, this case was kept under the category of negative for malignancy for valid statistical analysis.

Histological evaluation showed nonspecific chronic gastritis in 9 cases, benign gastric ulcer in 7 cases and malignancy in 34 cases. In two of the cases which showed benign gastric ulcers, cytology revealed cells with unequivocal malignancy. Repeat biopsy was performed in these two cases. The repeat biopsy however showed malignancy in

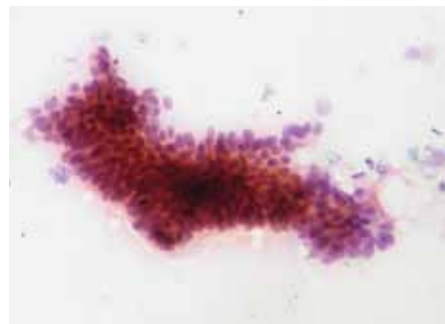


Figure 1: Touch smear cytology showing papillary fragment of malignant cells (Papanicolaou stain, X100)

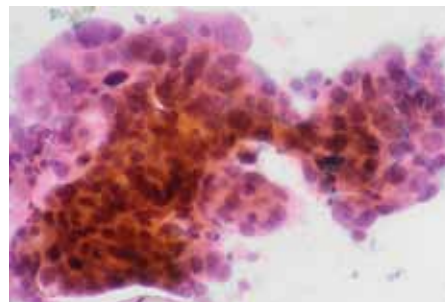


Figure 2: Touch smear cytology showing cohesive clusters of malignant cells (Papanicolaou stain, X400)

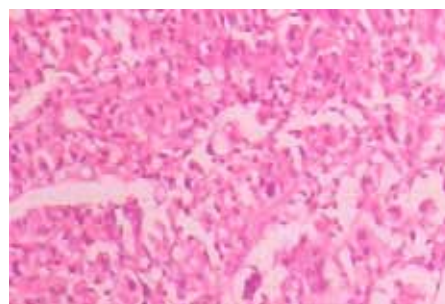


Figure 3: Poorly differentiated adenocarcinoma. Note the presence of signet ring cells. (HE stain, X200)

Table 1: Comparison of cytology and histology

	Malignant on histology	Benign on histology	Total
Malignant on cytology	33	0	33
Benign on cytology	3	14	17
Total	36	14	50

Table 2: Sites involved in gastric adenocancer

Site of tumor	No. of cases
Gastroesophageal junction	9
Cardia	5
Body	7
Antrum	15

both of the cases, hence a final diagnosis of malignancy was made. Similarly, out of 16 cases which were diagnosed as negative on cytology, 2 turned out to be malignant on histology (fig. 3). One case which was unsatisfactory for evaluation on cytology, histology showed positive for malignancy. Table 1 compares the results of cytology with histology.

According to the above data, the sensitivity and specificity of cytology are 91.6% and 100% respectively. The positive predictive value of cytology is 100% where as the negative predictive value is 82.3%.

The mean age of 36 patients finally diagnosed as gastric malignancy was 40 years with maximum patients in fourth decade. The male to female ratio was 2:1. Antrum of the stomach was the commonest site of involvement. Table 2 shows the commonest sites of gastric cancer. All 36 cases were adenocarcinoma, of which 7 were well differentiated, 10 moderately differentiated and 19 poorly differentiated. Resection specimens were available in 6 of the poorly differentiated carcinomas, of which 2 were sub-typed as signet ring cell carcinoma.

DISCUSSION

Endoscopy has greatly facilitated the detection of upper gastrointestinal (GI) lesions.⁶⁻⁸ Endoscopic biopsy has been the routine method of diagnosing gastric cancer, but there are controversies regarding the role of cytology. According to Francis et al, cytology is an invaluable adjunct in the diagnosis of gastric cancers where as other studies indicate that combining cytology with biopsy will increase false positive rates.^{9,10} Cook et al stressed the use of cytology only if there is any difficulty in obtaining adequate tissue.¹¹

In our admittedly small series of cases, biopsy touch smear cytology could achieve diagnostic sensitivity and specificity of 91.6% and 100% respectively. Other studies have shown sensitivity ranging from 85 to 96%.^{5,12} Imprint cytology was found to be even more sensitive and superior to biopsy in some studies.^{2,13} In our study too, two cases which were originally negative on histology, cytology could diagnose malignancy, which was subsequently proven by a repeat biopsy. Hence, cytology offers a distinct advantage over histology in such type of cases as presence of few viable obviously malignant cells in touch smear are sufficient for diagnosis. On the contrary, single malignant cells or small clusters of cells may be overlooked or underestimated if a definite 'tissue pattern' is lacking in histologic sections.¹³ In cases with positive cytology and negative histology, it is however recommended that a repeat biopsy should be done to confirm the diagnosis.

Although highly accurate in the diagnosis of malignancy, touch smear cytology can not replace biopsy examination for tumor typing and confirming the invasion of tumor. The two techniques of touch smear cytology and histology remain complementary and both should be utilized for maximum diagnostic accuracy.^{3,13}

CONCLUSION

Touch smear cytology is a highly sensitive and specific technique for identification of gastric malignancy. It is a simple, rapid and cheap technique which may be routinely used along with endoscopic biopsy to ensure diagnostic accuracy.

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