

ENDOSCOPIC BIOPSY AND BRUSHING CYTOLOGY COMPARED TO OPEN TISSUE BIOPSY A STUDY OF 50 PATIENTS WITH UPPER GASTROINTESTINAL TRACT MALIGNANCIES

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ABSTRACT

Background: The use of fiberoptic endoscopy revolutionized diagnostic gastroenterology. The ultimate diagnosis of malignancy is based on histologic or cytologic criteria. Cytology is a valuable adjunct to biopsy, with the combined yield of the two superior to the yield of either individual technique. Studies done in Basrah evaluated the diagnostic efficiency of brushing cytology, considering endoscopic biopsy results as a gold standard.

Aim: To evaluate the clinical utility of endoscopic biopsy and brush cytology versus open biopsies.

Material and Methods: Over the period from October 2002 to October 2006, fifty patients were selected with a high suspicion of malignancy by endoscopic examination. Endoscopic biopsy and brush cytology were taken. All the fifty patients proved to have malignancy depending on histopathological finding of open tissue biopsies. The cytology smears were fixed in 95% ethyl alcohol and stained by Papanicolaou stain while the histological specimens processed routinely and stained by hematoxylin and eosin. Analysis done for the results of both techniques and compared with other studies.

Results: From the 50 patients with malignancy, brush cytology was positive in 47 (sensitivity 94%) and the endoscopic biopsy in 44 (sensitivity 88%). Brush cytology diagnosed 3 cases with negative endoscopic biopsy and thus added 6% to the diagnostic yield of malignancy.

Conclusion: Brush cytology got higher sensitivity than endoscopic biopsy; however, the two techniques are complementary for the diagnosis of upper gastrointestinal tract malignancies.

INTRODUCTION

Most of the malignant lesions of the upper gastrointestinal tract were advanced at the time of diagnosis.^[1]

Early detection of these lesions has so long been a golden goal. Stomach is the most common site, pathogenesis of gastric carcinoma is closely related to environmental^[2] and genetic factors.^[3]

It is common in Japan, Chile and Italy.^[4] It always ranks within the commonest ten cancers in Iraq.^[5] In Basrah it comprises the 8th position and represent 4.2% of the new cancer cases diagnosed in 2005.^[6]

Among the malignant tumors that occur in the stomach adenocarcinoma is overwhelmingly the most important and the most common,^[7] next in order of frequency are lymphomas, carcinoids and stromal tumors.^[7,8]

Primary gastrointestinal lymphoma represents 1%-4% of all gastrointestinal tract malignancies. It can be of B or T cell type, the most common is MALT lymphoma (B cell in origin).^[7,9]

Helicobacter pylori has been implicated as an important etiologic factor in gastric carcinoma through its role in the development of chronic gastritis and also it provides the necessary background for MALT lymphoma.^[10-14]

Esophageal carcinoma is one of the highly lethal cancers worldwide, the majority are squamous cell carcinoma, but in the last years there has been increase in the

incidence of adenocarcinoma associated with Barrett esophagus in some countries like the United States.^[7,15,16] Fiberoptic endoscopy has greatly enhanced the ability to directly visualize several parts of the gastrointestinal tract and obtain specimens for cytohistologic evaluation. Over the last years the use of gastrointestinal cytology has declined due to preference for tissue biopsies,^[17] however, cytologic evaluation is often complementary to histologic diagnosis and are quite accurate and safe in expert hands.^[18] More than one study done in Basrah to evaluate the sensitivity of brush cytology considering endoscopic tissue biopsy as standard.^[19,20] Therefore, the present study was carried out to evaluate the sensitivity and clinical utility of endoscopic biopsy and brushing cytology versus open tissue biopsy.

MATERIAL AND METHODS

Over the period (October 2002-October 2006) 300 symptomatic patients had endoscopic examination performed in the endoscopy unit at Al-Sadr teaching hospital in Basrah. Patients were referred from different departments within the hospital. The indications for endoscopy were persistent gastrointestinal symptoms such as epigastric pain, vomiting, dysphagia, retrosternal chest pain, haematemesis, malena,

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anorexia and weight loss. The patients were endoscoped after overnight fasting, by the use of Olympus GIF-X230 videoscope. Fifty patients (26 women & 24 men) with age range (26-82) years, had revealed visible lesions which are highly suspicious for malignancy. Endoscopic biopsy & brushing cytology done for all of them. Brushing was done after biopsy taken and it was achieved by plunging the brush firmly and briskly into the mucosa (5-10) times.^[21,22] For every case (4-6) smears were done, fixed rapidly in 95% ethyl alcohol and stained by Papanicolaou stain.^[21] Endoscopic biopsies (4-6) pieces taken, processed routinely and stained by hematoxylin and eosin stains. All the fifty cases were regarded malignant depending on histopathological examination of open tissue biopsies, sensitivity for both brush cytology and endoscopic biopsy were done and compared with other studies.

RESULTS

Fifty selective patients were included in this study 26 women & 24 men. Table-1 shows the age and sex distribution of the patients, the majority were in the 45-54 age group. The histopathological finding in open biopsy specimens, revealed larger number of cases of stomach were adenocarcinomas. (Table-2).

Table 1. Age & Sex distribution of the 50 patients.

Age (in years)	Males	Females	Total
25-34	0	3	3
35-44	3	5	8
45-54	11	10	21
55-64	7	6	13
65-74	0	0	0
75-84	3	2	5

Table 2. Distribution of cases according to site and histopathological finding in open biopsy.

Site	No. of cases	Histopathological type
Oesophagus	8	7 squamous cell carcinoma 1 adenocarcinoma
Stomach	37	34 primary adenocarcinoma 1 metastatic pancreatic adenocarcinoma (direct spread) 2 Large cell lymphoma
Duodenum	5	3 metastatic carcinoma (1 pancreas, 2 Gallbladder) 2 GIST*

*Gastrointestinal stromal tumor.

Endoscopic biopsy and brushing cytology results versus open biopsy results seen in (Table-3). Three false negative cytology results compared to six in the endoscopic tissue biopsy.

Table 3. Brush cytology and endoscopic biopsy results versus open biopsies.

Results	Oesophagus			Stomach			Duodenum		
	Brush	Endoscopic Bx	Open Bx	Brush	Endoscopic Bx	Open Bx	Brush	Endoscopic Bx	Open Bx
No. of positive cases	8	8	8	36	33	37	3	3	5
No. of Negative cases	0	0	0	1	4	0	2	2	0

*Bx: Biopsy

The overall results of brush cytology and endoscopic tissue biopsy are shown in (Table-4). Brush cytology was positive for malignancy in 47 cases (sensitivity 94%) and tissue biopsy in 44 (sensitivity 88%).

Table 4. The overall results of endoscopic biopsy and brush cytology irrespective to site with the sensitivity of both techniques.

Results	Brush cytology	Endoscopic Bx
No. of positive cases	47	44
No. of negative cases	3	6
Sensitivity	94	88

DISCUSSION

Brush cytology results

In this study no unsatisfactory case was found, this could be explained by that brushing was done after biopsy was taken, so provide a raw area that facilitated exfoliation, this explanation leads us to the question is it better to do brushing before or after biopsy taken. Malhotra^[23] in his study took several cytology specimens including brush cytology before and after biopsy resulting in sensitivity of 80% & 86.6% respectively. Al Diab study^[19] (brush cytology before biopsy) represented a sensitivity of (91.3%) which is nearer to the sensitivity of this study (94%), this may be explained by that two stromal tumors were included in present study, resulting in negative results and affecting the overall sensitivity. In three cases the brush smears were positive while endoscopic biopsy were negative, all the cases proved to be malignant by open biopsy, this means cytology added 6% to the diagnostic yield of malignancy, nearly similar results seen in Cusso study^[24] (6.7%). No false positive cases reported in this study, however, it was mentioned in many studies.^[18,24] Atypical cells in chronic atrophic gastritis, regenerating epithelium, megaloplastic anaemia, polyps and menetrier disease may lead to false positive results.^[21] Three false negative cases seen in this study (1gastric lymphoma and 2 from duodenum-GIST), representing 6%. Al Diab^[19] in his study reported 2 false negative cases out of 23 malignant cases (8.6%). Cusso^[24] presented (3%) for false negative cases, this

lower result in the latter study may be explained by that lymphomas and stromal tumors were excluded. False negative cases may occur as a result of excessive bleeding at the brushing area, improper brushing technique, mesenchymal tumor or tumor with excessive fibrosis.^[22]

Endoscopic biopsy results

The most important factor influencing the yield of endoscopic biopsy is the number of pieces.^[18] In this study 4-6 pieces taken, this may explain why the percent of correct positive diagnosis in endoscopic biopsy is lower than brush cytology. False-negative diagnosis with biopsy specimens are most often seen with ulcerating types and are inversely related to the number of pieces obtained.^[25] It is also difficult to take biopsy from stenosed pylorus, bleeding lesions or the patient discomfort make the examination difficult.

Statistical results: the sensitivity of brush cytology results in present study was higher than Malhotra^[23] and Cusso^[24] studies (86.6% & 86.9% respectively). The latter study includes 903 patients with malignant lesion and done over 12 years period. Al Diab^[19] study gave a nearer sensitivity (91.3%), but it represented the results of both benign and malignant lesions. The sensitivity of endoscopic biopsy in this study is nearer to that of Malhotra^[23] and Cusso^[24] studies (90% & 92.3% respectively), however, the relatively lower percent in present study may be explained by the number of biopsies taken, facilities and also whether stromal tumors were included or excluded from the statistical analysis.

In Conclusion, this study concludes that the combination of endoscopic and brush cytology examinations together with tissue biopsy will add more to the diagnostic accuracy. Brush cytology helps in clarifying the nature of suspicious lesions by endoscopy and saving the time in contravercial cases, but definitely it cannot replace the tissue biopsy.

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