Endoscopic biopsies versus brushing cytology in the diagnosis of various gastro intestinal lesions with special reference to gastric tumours

By

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Abstract

Objective: To correlate the diagnostic efficiency of brushing cytology versus endoscopic biopsies in the diagnosis of various gastro-intestinal lesions with especial reference to gastric tumours.

Methods: Eighty three patients who had visible mucosal lesions were studied. All lesions were brushed and biopsied and were read blindly by one pathologist

Results: The sensetivety and positive predictive values for brushing cytology were 91.3% and 84.6% respectively, while specificity and negative predictive value were 93.3% and 96.5% respectively. The cumulative diagnostic yield for both test was 92.7% .

Conclusion: Brush cytology is convinient, safe and accurate technique for the diagnosis of various gastro intestinal lesions which should be used concurrently with endoscopic biopsies.

Key words: Brushing cytology, endoscopic biopsy, gastric cancers.

Introduction

The gastro intestinal (GI) tract along with its accessory glands are one of the most common systems of the human body affected by various cancers. The pattern of primary (GI) cancer differs in different region of the world depending upon the genetic, cultural, dietary and socioeconomic factors.[1]

More than 90% of gastric cancers are adenocarcinoma; the incidence is more common in developing countries than industrialized nations and show predilection of urban and lowers socioeconomic groups. Japan, China, South America and Eastern Europe exhibit the highest rate. Helicobacter pylori has classified by WHO as a carcinogen and epidemagogically Linked to gastric adenocarcinoma and (MALT) Lymphoma.[2, 3]

Carcinoma of the esophagus is one of the most Lethal of all cancers. Historically squamous cell carcinoma constituted 95% of all esophageal carcinoma however, the incidence of adenocarcinoma of the esophagus has rapidly increased and adenocarcinoma now represents 50% of newly diagnosed cases of esophageal carcinoma.

Colo-rectal cancer is the third most common malignant diseases and the second most common frequent cause of cancer death in the United States.[5] Worldwide colorectal cancer is the fourth commonly diagnosed malignant diseases.[6]

In Iraq, according to Iraqi cancer registry of 1997, cancer of the stomach was the eight commonest cancer among solid human tumours. In Basrah (Southern Iraq), cancer of the stomach was the eight commonest cancer in 1997 which took the 6^{th} position in a year 2000.[7]

A large retrospective review suggested that only one person per million populations under the age of 55 presenting with uncomplicated dyspepsia and no sinister symptoms is likely to have cancer.[8]

Endoscopy is effective for diagnosis, permitting suspect tissues to be sampled to pathological examination. Prospective studies report accuracy figures to initial diagnosis of esophageal or gastric cancer are 90%

The role of brush cytology as an adjunct to endoscopic biopsy in the diagnosis of various benign and malignant lesions has been investigated and found to the very useful.[9-20]

This study was conducted to correlate the diagnostic efficiency of brushing cytology versus endoscopic biopsies in diagnosis of various gastro-intestinal lesions with special reference to gastric tumours and to asses the specificity and sensetivety of brushing smears to that of standard biopsy samples .

Patients and methods

A prospective study was carried out at Basrah teaching hospital from the period of July 1999- December 2001. 1327 upper and 60 lower (GI) endoscopic examination were performed . Only 83 patients who had visible mucosal lesions were enrolled in the study .

Lesions were first brushed, using sheathed cytology brushes. Brushing were collected by gentle rubbing the surface of brush with the mucosal wall in all directions, brushing smears were then spread on 6-8 clean glass slides and fixed immediately in 95% ethyl alcohol.
Six punched biopsies were then obtained from the lesion which were processed in the standard manner and stained with haematoxyline and eosin. Cytological and biopsies were read blindly by one pathologist. The sensitivity, specificity and predictive values for brushing cytology were calculated considering endoscopic biopsy results as a gold standard.

Results

Out of 1387 patients who were endoscoped, only 83 (5.9%) showed visible mucosal lesions. 53(63, 1%) were males and 30(24.9%) were females. 27(32.5%) and 56(67.4 %) had malignant and benign lesions respectively (Table-1).
Of the malignant lesions 21(77.8 %) were gastric, 3(11.1%) rectal and 3(11.1 %) were esophageal (Table-2).
The majority of gastric tumours were adenocarinoma 19(90.4%). 7(33%) of these were at prepyloric region (Table-3)
(Table-4) Showed, age and sex distribution among malignant lesions. The majority of patients 14 (51.84%) were in the age group of 40- 59.
Brushing cytology showed malignant lesions in 25(30.1%) patients, while endoscopic biopsy was postive in 23(27-7 %) patients.
The two false negative malignant lesions by brush cytology were positive by standard biopsy samples, while the four negative lesions by biopsy which were positive by brush cytology underwent surgery because of high clinical suspecion and were proved to have post resection carcinoma (Table-5)
The sensitivity and positive predictive values for brushing cytology were 91.3% and 84.6% respectively, while specificity and negative predictive values were 93.3% and 96.5 % respectively.
The cumulative diagnostic yield for both tests was 92.7% which was superior to that of brush cytology or biopsy alone.

Table 1 . Visible endoscopic Lesions in the examined patients

Patients	Malignant (%)	Benign	Total
Male	16(19.2)	37 (44.5)	53
Female	11(13 .3)	19(22.8)	30
Total	27(32.5)	56 (67.3)	83

Table 2.Types of malignant Lesions

Lesions	No.%
Gastric	21 (77.8)
Rectal	3 (11 . 1)
Esophageal	3 (11.1)

Table 3.Types and sites of visible endoscopic lesions

Type of lesions	Pre pyloric		Greater curve		Lesser curve		Esophagus		rectum		others		Total
Malignant	7	Adenocarcinoma	7	Adenocarcinoma	5	Adenocarcinoma	3	Squamous carcinoma	3	Adenocarcinoma	2	Hodgkin's	27
Benign	13		16		21		0		3		3		56
Total	20		23		26		3		6		5		83

Table 4 .Age and sex distribution among malignant lesions

Age in years	Males	Females	Total (%)
20– 39	3	4	7(25.9)
40 – 59	7	7	14 (51. 8)
60+	4	2	6 (22. 3)
Total	14	13	27 (100)

Table 5. Lesions as detected by brushing cytology versus forceps biopsy

	Biopsy (Standard)		
Brushing cytology	+ve malignant ↓	- ve benign ↓	Total
+ve malignant →	21	4	25
-ve benign →	2	56	85
Total	23	60	83

Discussion

The merit of brushing cytology of the upper (GI) tract has been questioned since it appears to duplicate biopsy , however , empiric advantages of endoscopic brushing cytology include its rapid turn - around time , its ability to sample large surface area with minimal tissue trauma , minimal invasiveness and easier to reach to stenotic lesions than the forceps (21-22)

Our observation of high sensitivity and specificity of brushing cytology has agreed by many other published papers (10, 23 - 26).On this issue a meta analysis of published reports on the diagnostic performance of biopsy and brushing in detecting gastric malignancy has been studied by Sadowsk DC and Rabeneck L (27) they concluded that for gastric ulcer discovered at endoscopy, the preferred strategy is to perform either cytological brushing or histological biopsy. The previously recommended strategies for performing both cytological brushing and histological biopsy should be reconsidered. Accordingly, regardless of the biopsy findings, patients with suspicious cytological reports require careful evaluations, since a high percentage of those cases were subsequently verified having malignancy (28). In our study, we did not come across any suspicious findings on cytological examination.

The value of cytodiagnostic results on endoscopic brushing obtained before or after biopsy has been studied. Zargar SA (et al) (29)

had concluded in their study that the accuracy of brush cytology in patients with carcinoma was significantly higher when the brushing was performed before biopsy than after biopsy (93. 8%

) versus(82. 6%) respectively (P<0.1) , while singh T (et al) (30) concluded that positivity of brushing before biopsy was 87.5% while after biopsy was100% . Although the differences were not statistically significant (P >0.05), but the quantitative yield of the material was significantly high (p <0.05). In this study we obtained brushing samples before biopsy.

Endoscopic brush cytology is also a reliable modality for the diagnosis of gastric tuberculosis. Jains et al (31) in their seven suspected cases of gastric TB studied demonstrated granuloma or epitheloid cells in brush smears in all cases, while TB bacilli demonstrated in four cases. In our study we did not come across of any gastric tuberculosis.

Taking six biopsies will identify more positive cases of cancer than taking four or less , but there appear to be little additional yield for taking more than six biopsies (32) In our study we have obtained six biopsies from suspected lesions .

Brush cytology is convenient, safe and accurate technique for the diagnosis of various gastro intestinal lesions which should be used concurrently with endoscopic biopsies.

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