Original Research Article

Endoscopic biopsy yielding upper gastrointestinal malignancies

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Abstract

Objective: Aim of this study is to find the optimal number of endoscopic biopsies needed to diagnose the upper gastrointestinal malignancies in the patient who undergoes endoscopic evaluation. **Methods:**This is an observational study conducted in Government Stanely Medical College. Patients with upper gastrointestinal symptoms underwent esophago gastroduodenoscopy using forward viewing scope after getting the proper consent from them. Procedure was done by well experienced endoscopist. In patients with suspected lesion of malignancy in the tract, biopsies are taken. Number of biopsies aimed are eight and serially taken biopsies are labelled in four separate vials. Each vial contains two consecutive samples in the 10% formal saline solution.Details of the site, extent, and type of the lesion were recorded.In case of haemorrhage or any complications the procedure is terminated with proper monitoring of patient until discharged. **Results:**The yield of endoscopic biopsy specimens from 50 patients after combining the results from successive vials. The yield in the first vial is 94% and the cumulative percentage of the second vial yielded 100%, which means the malignancy in the specimen is proved without doubt in the first two vials itself for all the patients.**Conclusion:**In conclusion, this study shows that four biopsy specimens are likely to yield a 100% diagnosis in advanced upper gastrointestinal malignancies. Whereas the endoscopic biopsy yield in the early stages of carcinomas should be evaluated in further studies.

Keywords:Endoscopic Biopsies, Gastrointestinal Malignancies, Endoscopic Evaluation.

Introduction

Upper gastrointestinal carcinomas are becoming increasingly common in Indian population accounting to the change in food habits and environmental changes occurring rapidly in the country. Of patients whom we included in study from the total of fifty patients half of the patients had gastric carcinoma, Others comprising esophageal carcinoma and periampullary carcinoma.There is a gradual increase in esophageal carcinoma incidence compared to the past incidence. Periampullary carcinomas contribute to 12% of the total upper gastrointestinal malignancies. Gastric carcinomas account for the 52% of total malignancies in the upper gastrointestinal carcinomas. Esophageal carcinomas account for about 36% of carcinomas included in this study[1-3].

Materials and methods

Tissue-Sampling Techniques

Biopsy and brushing

By combining the various tissue biopsy techniques to the endoscopy visualisation ,the utility of the endoscopy is enhanced one stepahead. In diagnosis of infections in the upper gastrointestinal tract is very difficult in past,but with the cytology of the tract by endoscopy is particularly useful for confirming the infections by bacterial, fungal and Helicobacter pylori infection. In upper gastrointestinal malignancy evaluation , it can add a yield of 10% to endoscopic biopsy alone. Particularly in the malignancy of upper gastrointestinal brush cytology is very useful as sensitivity is around 80% to 90% and specificity is around 100%.In case of touch cytology the standard biopsy samples itself is processed by rolling it in the slide and fixing it for the study. In evaluation of malignany and particularly the infections is the main advantage of this cytology.This technique can be used as an adjunct to the biopsy alone.

Standard biopsy techniques

In case of foregut malignancies the yield is maximum with standard biopsy as disease represents at the mucosal level. It yields a maximum results when targeted correctly. For H. Pylori disease evaluvation it the diagnostic yields as been shown to be comparable in all parts of the stomach. A pediatric colonoscope can be used for the jejuna limbs,after gastrojejunostomy to enter into the jejunal limbs.Infected patients are being diagnosed by combining three biopsy samples,taken from the antrum pyloric region, nearthe incisura in lesser curvature and body of stomach greater curvature.With malignant lesions,when the biopsyare taken from the rim of the ulcers and also from the base with number of biopsies being 8to10,the yield is maximum in diagnosis.thespecimens retained in the endoscopy channel can be used for the brush cytology and salvage cytology.with these procedures malignancy can be diagnosed upto100%

1.Sheathed brush is passed through the endoscopic channel which is used for the brush cytology.Sheath is positioned near to the area to be examined and extend the brush[5]

A Cells in the brush can be dislodged by moving it vigorously to and fro.

B To avoid sample loss while the thing being withdrawn through the endoscope biopsy channel,just retract the brush from the sheath.

C The slides for the cytologic review is prepared with these samples.

Another method of contributing to the sample yield is washing the brush in balanced salt solution.Forceps biopsy allows us to get adequate tissue (generally limited to the mucosa) for the diagnosis by histological examinations.Different kinds of biopsy for cepsare

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present,by choosing the proper forceps our intended sample can be obtained

1.Spiked forceps:In the single passage itself a chunk of multiple biopsies can be obtained by use this forceps as it is provided with multiple tiny projections. The endoscopist's ability to get tissue that is oriented tangentially to the endoscope may be enhanced by helping the forceps to firmly engage the tissue to be sampled.

2.Large cupped forceps,or jumbo forceps:These forceps arevery useful in taking large biopsies from the sites.it is usefull when only few attempts can be taken for a biopsy. For this large diameter endoscopes are needed for the passage of biopsy forceps.

3.Endoscopic mucosal resection: It is very useful technique in case of early malignancies and also when large areas are to be examined.it helps in the complete removal of suspicious areas.It can be combinedwith the endoscopic ultrasound when it can also serve as a therapeutic tool too.in high incident countries like japan it is very useful method.Hypertonic saline is used to elevate the lesion where the biopsy is targeted. It helps in raising the lesion and easy snaring of the lesion.

Disadvantages

Risk of bleeding

Perforation

Endoscopic Ultrasound:It has revolutionised the diagnostic technique in the gastro intestinal malignancies particularly in the upper digestive tract.This endoscopic ultrasound has main role in staging of disease which can be difficult by any other investigations. Its main applications are in1.diagnosis and staging of gastrointestinal cancers2.submucosal pathology and biopsy. 3.Common bile duct stones and also inpancreatic malignancies. EUS-guided fine-needle aspiration cytologyIts gaining more important in adjunct to the standard endoscopy.the yield in diagnosis is increased to100% when it is combined with the aging is more accurat standard biopsy technique.It is more useful in:

1.Esophageal,pancreatic,gastric and even in pulmonary neoplasia.

2.Staging is more accurate as compared the radiological investigations as CT and MRI[6]

3.The submucosal lesions are easily diagnosed by this endoscopicus gas the lesions are difficult to find in the radiologically in earlystages The stromal tumors,neuroendocrine tumors are easily identified and at the early stages with the use this endo usg.Drawbacks are cost and long learning curve.

Consent: Written consent was obtained from the relatives of patients after explaining them the nature and purpose of the study. They were assured that confidentiality would be strictly maintained. The option to withdraw from the study was always open.

Observation chart

Table 1:Gastrointestinal Malignancies

Parts Of Upper GI	Number Of cases
Esophagheal Carcinoma	18
Gastric Carcinoma	26
Periampullary Crcinoma	6

Table 2:Esophageal Carcinoma

Upper Esophagus	1
Middle Esophagus	8
Lower Esophagus	6

Table 3:Gastric Carcinoma

Site	Number of cases
Fundus	0
Body	3
Antropylorus	23

Gastric Carcinoma: Tumor location in the stomach has a greater significance for the diagnosis,management and prognosis of the patient. Proximal tumors stomach are more common in western world due to increased incidence of gastroesophageal reflux disease and obesity in western population. They account for more than half of the patients gastric cancer patients. But the trend in the developing countries is totally different from western world incidence of gastric cancers.It corresponds to the incidence of Helicobacter pylori infection in the stomach.The type of tumor has also grater impact on the outcome of patients.Distal gastric tumors are common in the developing countries like India where we have the higher incidence of Helicobacter pylori infection which correlates to the higher incidence of tumor in distal stomach.Theintestinal types are most common in the distal tumors of stomach as compared to the diffuse type in the proximal tumors[7-10]

Table 4:Sex distribution in gastric carcinoma

Male	16
Female	10
Total	26

Table 5:Periampullary Growth

Male	3
Female	3
Total	6

Table 6:Esophageal Carcinoma

Squamous Cell Carcinoma	11
Adenocrcinoma	7

In past squamous cell carcinoma accounted for more than 95% of cases but in recent years due to increased incidence of Barrett esophagus the incidence of adenocarcinoma arising from it.In united states squamous cell carcinoma is around 1.5 to 7 cases per 100000 people. In India it is around 100 to 500 per 10000 people.Squamous cell carcinoma is five times more common among Africans Americans than in whites,whereas adenocarcinoma occurs approximately three to four times more common in whites,particularly in men.In this study the incidence of squamous cell carcinoma is 69% and adeno carcinoma is 39%,which correlates with Indian population. Squamous cell carcinoma is also also common in the upper and middle esophagus and adenocarcinoma more common in the lower segment.

Table 7:Squamous Cell Carcinoma

Well Differentiated	0
Moderately Differentiated	11
Poorly Differentiated	0
Total	11

Table 8:Adenocarcinoma of esophagus

Well Differentiated	1
Moderately Differentiated	4
Poorly Differentiated	3

Table 9:Esophageal Carcinoma

	Squamous Cell Carcinoma	Adenocarcinoma
Upper	1	0
Middle	7	1
Lower	3	6

Table 10:Age wise distribution of upper GI malignancies

Age	Esophagus	Stomach	Periampullary
20-30	1	1	0
30-40	1	1	0
40-50	3	10	2
50-60	6	4	1
60-70	5	9	3
70-80	2	1	0
Total	18	26	6

Table 11:Yield in Specimens

Vial Number	No .of Positive Patients
First	47 OUT OF 50 (94%)
Second	44 OUT OF 50 (88%)
Third	27 OUT OF35(77.14%)
Fourth	5 OUT OF 12 (41.66%)

Table 12:Positive numbers and Percentage

Vial Number	No.of Positive Patients	% of Positivity
I	47	94%
I+ II	50	100%
I+ II+III	50	100%
I+ II+ III+IV	50	100%

Result

Esophageal carcinomas has increased rapidly in the western countries in few decades.In the esophagus most common site ofthe malignancy is middle third of esophagus, as it continues in this study also but thereis a alarming rise in the incidence of lower esophageal carcinomas. Its increase is greater than any other malignancy. Upper esophageal growth accounts for 6% of esophageal tumors which is the lowest and middle esophageal tumors accounts for maximum number with 44% of cases in thisstudy. Lower esophageal growth consists of 33% of tumors in this study. OG junction tumors are include in these parate entity and account for 17% of tumors in this study. Proximal 5cm tumors of gastric is also included in the esophageal tumors only based on the new classification. Although the esophageal carcinomas are uncommon compared to other malignancies it is gaining importance due to advents in the endoscopic diagnosis and early interventional modalities.Sex distribution in the esophageal carcinomas is very important compared to other malignancies. Males are show a stricking predominance in esophageal carcinomas for a long time. In white males esophageal adenocarcinomas was double that of the Hispanics and four fold higher than that of blacks. Asians, and native Americans.In all races the incidence of esophageal carcinoma is very less compared to the male incidence of tumor. Males have more incidence of sqamous cell cacinoms compared to females. In this study also incidence is more in the males compared to females. Males account for 61% of esophageal tumors and females consist of 39% of tumors. Adenocarcinomas of cardia incidence is low amomg the API males compared with white males, butit was higher compared with black males. Howevere thinic differences are important in the esophageal carcinoma,because of increasing trend of adenocarcinoma of lower esophagus.In the esophagus the site of tumor mostly correlates with type of malignancy .squamous cell carcinoma occurs most commonly in the upper and middle third of the esophagus and adenocarcinomas in the lower third of esophagus.In this study in upper third carcinomas all are squamous cell carcinoma and in middle third of esophagus most of the tumors are squamous cell carcinoma .In lower third of esophagus the incidence is changing,as adenocarcinomas are more common than sqamous cell malignancies. Pathology of the esophageal carcinoma is very important on which treatment is decided. Squamous cell carcinoma is more common and the histology of this is very important in prognosis and treatment. Mostly the tumors are well to moderately differentiated in squamous cell carcinoma.In this study all the patients had moderately differentiated carcinoma. Adenocarcinomas are increasing at a very high rate compared to any other malignancy.In this study also the adenocarcinomas are comparatively more in number. About 50% of adenocarcinomas are moderately differentiated and next to it 38% are poorly differentiated. Only 12% of tumors are well differentiated adenocarcinomas in this study. These differentiation affects the outcome and treatment.The incidence of esophageal adenocarcinoma increases with age,with a median ageat diagnosis of 55 to 60 years and a striking male preponderance (7:1)The incidence stomach cancer also increases with age starting in the fourth decade of life and generally peaks in the seventh decade. In the United States, demographic risk factors for periampullary cancer include age,with the majority of patients in or beyond their sixth decade of life; sex,with a

slight male preponderance.In this study esophageal and stomach cancers are seen in age groups from 20 years to 80 years. Esophageal cancer occurring mostly in the fifth decade and stomach cancer in the fourth decade. Periampullary cancers are occurring from fourth decade to sixth decade,with peak during the sixth decade.In all the fifty patients four samples are obtained with few patients had the difficulty in getting after that.Most of the patients presented to us are with advanced lesions and there was bleeding while taking biopsies from the advanced lesions.so third vial specimen was taken for only 35 patients and fourth vial taken for 12 patients only. The patients who had bleeding are monitored continuously with fluids and vitals monitoring.Afterwards patients are discharged safely with instructions. The yield of endoscopic biopsy specimens from 50 patients after combining the results from successive vials. The yield in the first vial is 94% and the cumulative percentage of these cond vial yielded 100%,which means the malignancy in the specimen is proved without doubt in the first two vials itself for all the patients.

Statistical Analysis

Data was compiled using MS excel 2007 and analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable; $p<0.05$ was taken as statistically significant.

Discussion

Gastric carcinomas account for the 52% of total malignancies in the upper gastrointestinal carcinomas.Esophageal carcinomas account for about 36% of carcinomas included in this study. Most of the carcinomas are moderately differentiated carcinomas. In esophagus most of the tumors are squamous cell carcinomas though there is increase in adenocarcinomas.In stomach most of the tumors are distal tumors in antro pyloric region and all are adenocarcinomas with predominantly moderately differentiated cancers.The endoscopy findings of most of the patients is advanced nodulo proliferative or ulcer oproliferative lesions.

Sancho Poch et al found that only one of 66 cases of gastric cancer in which eight specimens had been obtained was negative. However, these authors also did not take into account theorder in which biopsy specimens had been taken. Misumi et al[13] found that the diagnostic accuracy was 100% in gastric cancers when six or more biopsy specimens were obtained. Most of the other studies are also in gastric cancers and the number of biopsy specimens varied from 4-10.There are many studies of the diagnostic accuracy of endoscopically performed cytological techniques in the diagnosis of carcinoma of the oesophagus.In these cytological studies, the various authors have either not mentioned the number of biopsy specimens or have taken varying numbers,leaving thistothe judgement of the endoscopist' rather than evaluating the optimal number of specimens needed to obtain the maximum yield.Graham et al'conducted a study in which biopsy and cytology specimens were obtained from 202 consecutive patients, 27of whom had carcinoma of the oesophagus. In each instance the authors obtained seven biopsy specimens in three groups. Group A contained the first biopsy specimen; group B biopsy specimens 2, 3, and 4; and group C biopsy specimens 5, 6, and 7. In Graham's study, the first biopsy yielded a correct diagnosis in 92-6% of patients with oesophageal cancer; with four specimens accuracy went up to 96%,and with seven biopsy specimens it reached 96-3%.Seven biopsy and cytology specimens yielded a diagnosis in all the cases.

Conclusion

Our study differs from that of others in that:we evaluated more patients and the diagnostic yield of four biopsy specimens was 100%; two specimens were placed in each of the four vials rather than one, three,and three pieces in three vials;In conclusion, this study shows that four biopsy specimens are likely to yield a 100% diagnosis in advanced upper gastrointestinal malignancies. Whereas the endoscopic biopsy yield in the early stages of carcinomas should be evaluated in further studies.

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