

The Endoscopic Diagnosis of Minute Gastric Cancer

Dr. Mehmet Kadir AKSÖZ, Hiroshi TAKAHASHI M.d, Arture CARRANZA M.d, Yoshihiro SUZUKI M.d, Keichi SUGIYAMA M.d, Satoshi SUZUKI M.d, Kenzou KOUSEN M.d, Morihito SEKI M.d, Yoshiharu SATAKE M.d, Rikiya FUJITA M.d

Özet: ERKEN MİDE KANSERİNİN ENDOSKOPIK TANISI

5 mm ve altındaki erken mide kanserinin (minute gastric cancer) özelliklerini saptamak amacıyla 33 olguda endoskopik ve patolojik incelemeler yapılmıştır. Endoskopik bulgular özelliklerine göre 2 ana gruba ayrıldı: I) Kabarıklık (protruded) tip ve II) Çökük (depressed) tip. 29 olguda (%88) erosiv şeklin çokluğu ile çökük tipte lezyonlar saptandı. Kabarıklık tipte lezyon saptanan 4 olgunun 3'ünde (%9) adenoma benzeri ve 1'inde hiperplastik polip benzeri lezyonlar saptanmıştır. Lezyonların çapları 5mm'nin altında olup patolojik incelemelerinde iyi diferansiye adenokarsinom (27 olgu, %82), taşlı yüzük hücreli karsinom (5 olgu, %15) ve 1 olguda da (%3) orta derecede diferansiye adenokarsinom tanıları konulmuştur. Lezyonlar genellikle antrumda (17 olgu, %52) ve ön duvarda yerleşik olup tümü mukozaya sınırlıydı. 16 olguda (%48) tanısal zorluk çekildi. Endoskopik özellikleri gözeterek tanısal zorlukları değerlendirmeye çalıştık. Lezyon >3mm ise, basamak tarzı çökük erozyonsa, korpus alt kısmı ile antrum arasında yerleşirse ve çevreleyen mukozal ödem varsa tanı kolay olmaktadır. 4 hastada patolojik bulgular biyopsi ile kaybolmuştur.

Anahtar kelimeler: Erken mide kanseri, basamak tarzı çökük, tanısal zorluk,

Early gastric cancer is defined as a carcinoma which is limited to the mucosa and submucosa only, irrespective of whether or not metastasis to lymph nodes has occurred (1). Minute gastric cancer is early gastric cancer less than 5 mm in diameter. Although there are many endoscopic diagnostic methods and tools available, including chromoscopy(2) and magnifying endoscopy (3), it is still difficult to detect minute gastric cancer less than 5 mm in diameter. The endoscopic treatment of early gastric cancer has improved in recent years(4), therefore the diagno-

Summary: In order to find the characteristic features of minute gastric cancer less than 5 mm in diameter we performed endoscopic and pathologic studies of 33 cases. The endoscopic findings were separated into two main groups with features: I) Protruded type and II) Depressed type. In 29 cases (88%) a depressive lesion was detected with the dominance of the erosive type (22 cases, 67%), while 3 cases (9%) with ulcer scar like and 4 cases (12%) with patchy erythema like appearances were defined. There were 4 cases (12%) who showed the protruded type in which 3 cases (9%) had adenoma like and 1 patient had hyperplastic polyp like appearance. The diameters of the lesions were less than 5 mm. Pathologic findings showed the dominance of well differentiated adenocarcinoma (27 cases, 82%) with signet ring cell carcinoma following (5 cases, 15%). 1 case (3%) was diagnosed as moderately differentiated adenocarcinoma. In all cases the lesions were limited to the mucosa. The locations of the lesions were mainly in the antrum (17 cases, 52%) favoring the anterior wall. Diagnostic difficulty was experienced in 16 cases (48%). We tried to analyze the difficulties regarding the endoscopic features. It was easy to diagnose Minute Gastric Cancer when it's size was more than 3mm, when it was an erosion with stepwise depression, when it was located between the lower body and antrum, and when surrounding mucosal edema was present. In 4 patients the pathological findings disappeared by biopsy (12%).

Key words: Minute gastric cancer, stepwise depression, diagnostic difficulty.

sis of the smallest form of gastric cancer becomes more important. This importance is mainly focused on the recognition of the lesion as quick and as little as possible. Since time is a very important factor, we think that our attempt in knowing and recognizing the smallest form of gastric cancer (minute gastric cancer less than 5 mm) is essential. The objective of this study was to find the characteristic features of minute gastric cancer.

SUBJECTS and METHODS

In our institution 33 patients were diagnosed as minute gastric cancer by endoscopy and patho-

Department of Gastroenterology, Showa University Fujigao-ka Hospital Yokohama, JAPAN.

Tablo I: The pathologic findings of minute gastric cancer cases.

Well differentiated adenocarcinoma	27
Moderately differentiated adenocarcinoma	1
Signet ring cell carcinoma	5
Total	33

logical confirmation from 1983 to 1991. Tissue specimens for pathological diagnosis were obtained by biopsy, endoscopic mucosal resection, and surgical resection. In all the cases the pathological diagnosis was minute gastric cancer less than 5mm. The endoscopic findings were separated-into two main groups with subsidiary features: I) Protruded type, A. Adenoma like, B. Hyperplastic polyp like; II) Depressed type, A. Erosive type, a) Star like erosion, b) Erosion with stepwise depression; B. Ulcer scar like; C. Patchy Erythema like, a) Irregular redness, b) Star like redness. The easiness and difficulty in detecting these features were considered. Easy cases showed moth eating sign, stepwise depression, or other malignant signs. Difficult cases were the cases with no malignant signs.

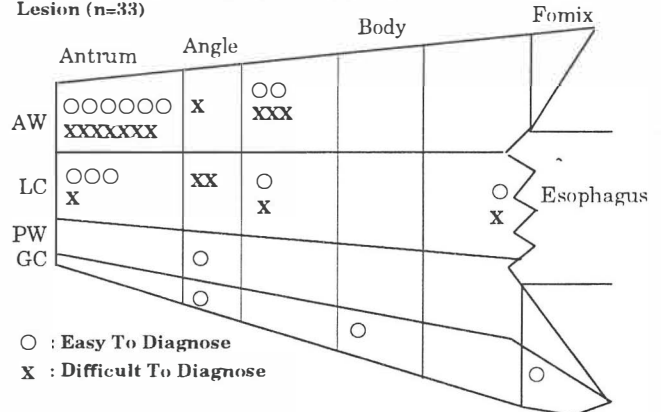
RESULTS

1. LOCATIONS and DIFFICULTY

The lesions were located (fig. 1) in the antrum (17 cases, 52%) favoring the anterior wall (13 cases, 39%). In 8 cases (24%) the locations were the body with the majority of the lower body (7 cases, 21%) favoring the anterior wall. The angle was the third site with 5 cases (15%) while in 2 cases there were protruded type lesions located in the cardia (6%) and 1 case (3%) a lesion in the fornix. As seen in fig. 1 lesions which were difficult to diagnose were randomly localized. When the type of the lesion was considered; the protruded lesions were detected in the cardia (2 cases), middle body (1 case), and lower body lesser curvature (1 case). All the other lesions were the depressed type.

2. PATHOLOGIC TYPES

In all cases the pathological diagnosis was minute gastric cancer less than 5 mm. All of the lesions were confined to the mucosa. Pathological findings revealed well differentiated adenocarcinoma in 27 cases (82%), signet ring cell carcinoma in 5 cases (15%), and in 1 case moderately differentiated adenocarcinoma (Table 1).

Difficulty In Diagnosis In Relation To The Location Of The Lesion (n=33)**Figure1:** The locations of the minute gastric cancer lesions (n= 33).

3. ENDOSCOPIC CHARACTERISTICS

Among the 33 cases 29 (88%) had depressive lesions with the dominance of erosive appearances (22 cases, 67%) (Table 2). Erosion with stepwise depression (fig. 2) was detected in 12 cases (36%). Star like erosion was found in 10 patients (30%). Ulcer scar like findings (fig. 3) were detected in 3 patients (9%) while patchy erythema like appearances were seen in 4 cases (12%) (fig. 4)-2 with irregular redness and 2 with star like redness. There were 4 cases in which the protruded type was seen (12%) with 3 adenoma like (3%) (fig. 5) and 1 hyperplastic polyp like appearance. Surrounding mucosal edema was found in 14 (42%) patients. This rate was 31% (5/16) with the difficult lesions and 53% (9/17) with the easy to diagnose lesions.

4. DIFFICULTY IN DIAGNOSIS IN RELATION TO THE SIZE OF THE ENDOSCOPIC FINDINGS

Tablo II: Endoscopic features of minute gastric cancer (n= 33).

I. Protruded type	
A. Adenoma like	3
B. Hyperplastic polyp like	1
II. Depressed type	
A. Erosive type	
a) Star like erosion	10
b) Stepwise depression	12
B. Ulcer scar like	3
C. Patchy erythema like type	
a) Irregular redness	2
b) Stra like redness	2

Table III: Difficulty in diagnosis in relation to the size and endoscopic findings.

Size (mm)	Endosc. Findings	Protruded Type		Erosive		Depressive Type		Patchy Erythema	
		Adenoma Like	Hyp. Poly Like	Star Like	Stepwise Depression	Ulcer scar Like	Irregular Redness	Star Like Redness	
-3				XX X		XX	XX		
3-4					OO O				XX
4-5		O XX	O	OO O XX XX	OOO OOO OOO	X			

O: Easy To Diagnose.

X: Difficult To Diagnose.

The sizes of the lesions were considered in 3 groups; less than 3mm, 3-4mm, and 4-5mm (Table 3). Among the 33 cases there were 7 lesions less than 3mm (21%). 5 cases had lesions 3-4mm in diameter (15%) and 21 cases were in the 4-5mm group (64%). 2 cases in which the sizes couldn't be measured but disappeared by biopsy were included in the first group. Among the 33 cases difficulty in diagnosis when related to the size was 100% in the first group, 40% in the second, and 33% in the third group. All the protruded lesions were 4-5mm in diameter.

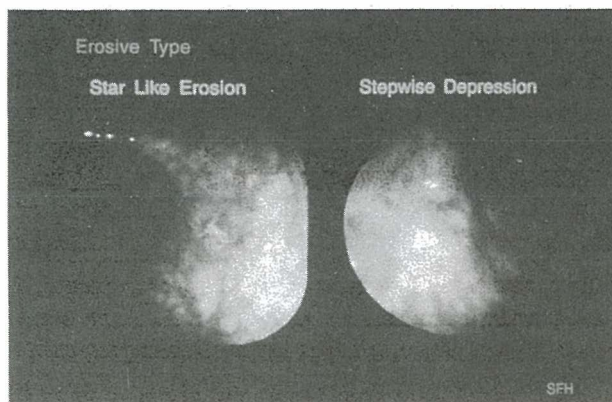
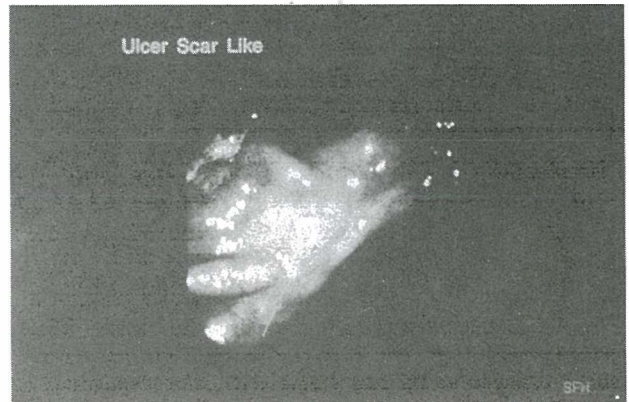
5. DIFFICULTY IN DIAGNOSIS IN RELATION TO THE PATHOLOGY OF THE ENDOSCOPIC FINDINGS

Diagnostic difficulty in relation to the pathology was seen (Table IV) in all kinds of lesions except the erosion with stepwise depression type. 14 cases (14/27;52%) with well differentiated adenocarcinoma, 2 cases with signet ring cell carcinoma (2/5) were in the difficult to diagnose group. 1 case with moderately differentiated adenocarcinoma was in the easy to diagnose group. The

pathology of the lesion didn't show any significant importance which would affect the endoscopic diagnosis.

DISCUSSION

The improvement of endoscopic systems and techniques (especially in endoscopic therapy) and their results have brought forth the importance of diagnosing early gastric cancer in its earliest form. Therapeutical decisions change according to the size and depth of the cancer lesion, so starting from this point of view, these lesions must be defined when it is in the smallest and superficial form. Iishi found that 70.9% of cancerous lesions of less than 5mm were overlooked endoscopically (2). They also found that minute gastric cancers were difficult to differentiate from benign lesions by endoscopic inspection. Many attempts have been made to diagnose minute gastric cancer. Staining methods with methylene blue(5), indigocarmine, and congo red-methylene blue(6) have been introduced for such reason. Besides staining techniques, magnifying endoscopy and computer analysis

**Figure 2:** Erosive type depressed lesions.**Figure 3:** Ulcer scar like depressed lesion.

Tablo IV: Difficulty in diagnosis in relation to the pathology and endoscopic findings.

Endosc. Findings	Protruded Type		Erosive	Depressive Type		Patchy Erythema	
	Adenoma Like	Hyp. Poly Like	Star Like	Stepwise Depression	Ulcer scar Like	Irregular Redness	Star Like Redness
Pathology	O		OOO	OOO	XX	XX	XX
Well-Diff.	XX		XXX	OOO			
		O	XXX	OOO			
Mod. Diff.			X	OOO	X		
Signet Ring Cell							

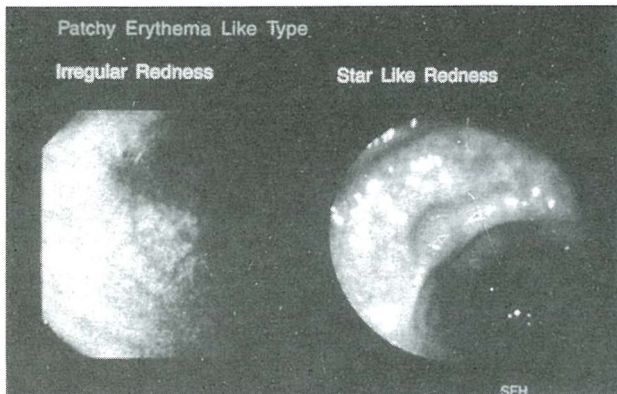
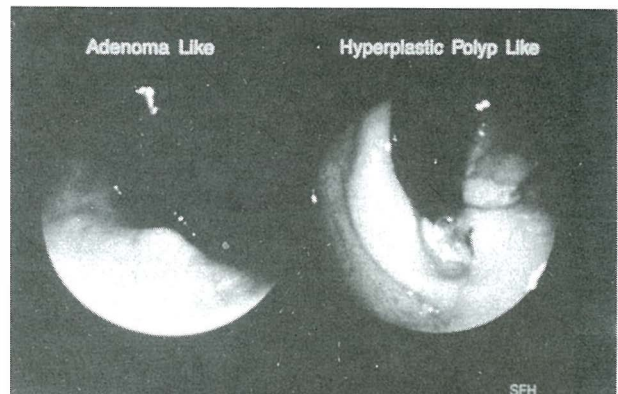
O: Easy To Diagnose.

X: Difficult To Diagnose.

has been performed to identify such lesions in our clinic(3). Lesions can be identified better with such techniques, but since they are first detected with usual endoscopes we must first recognize these lesions in order to utilize the investigatory methods mentioned above.

In 1986 Takahashi (7) has reported 12 cases of minute gastric cancer less than 5 mm regarding the endoscopic appearances and has emphasized the importance of detecting minute gastric cancer with usual endoscopes. In this previous study the endoscopic findings were classified into two types-the erosive and the red type. in this study we tried to classify the findings in detail by adding few more characteristic features. There were 4 protruded lesions (12%) and 29 depressed lesions (88%) detected endoscopically. These lesions were evaluated retrospectively in several aspects in relation to diagnostic difficulty regarding the nature of the appearance. Protruded lesions less than 5mm showed a diagnostic difficulty rate of 50% (2/4) while with depressed type lesions this rate was 48% (14/29). When the indi-

vidual characteristics of each group is determined, the erosion with stepwise depression type showed the best diagnostic accuracy rate of 100% (12 cases). On the other hand the other types showed very low rates. Ulcer scar like and erythema like lesions were 100%, star like erosion type was 60% difficult to diagnose. When the difficult diagnosis was related to the size of the lesion; lesions less than 3 mm showed 100% difficulty rate (7 cases). When lesions greater than 3 mm was considered the difficulty rate was 35%. From a different point of view considering the size, lesions which were greater than 3 mm were 65% easy to detect. All the lesions less than 3mm were depressed type lesions. This shows that, regarding the size of a lesion (in our study depressed type lesions), when less than 3 mm detection is difficult, but when it is greater than 3 mm it can be detected easily. When the localization of the lesion was concerned in relation to difficult diagnosis, we couldn't obtain a definitive result. As seen in fig. 1, approximately in every location there were difficult cases. But, the accumulation of the lesions in certain parts

**Figure 4:** Patchy erythema like depressed lesions.**Figure 5:** Protruded type lesions.

of the stomach suggest that the lesions in the other parts of the stomach (especially depressed lesions) are misdiagnosed. No certain result was obtained when difficult diagnosis was related to the pathology of the lesion, because most of the cases were well differentiated adenocarcinomas and when this was related to difficulty, the rate was 52%. We could not detect a distinct relation between the pathology and appearance of the lesion. Considering the surrounding mucosal edema, the difficult lesions showed 31% (5/16) positivity. With the easy to diagnose lesions this rate was 53% (9/17). Surrounding mucosal edema may be a feature in easy detectability. If we evaluate the 2 main groups individually; among 4 protruded type lesions, which their sizes were greater than 4 mm, difficulty was related to the determination of the nature of the lesion (50%). Among 29 depressed type lesions 7 out of 14 difficult lesions were less than 3mm and difficulty was related to the size (24%). The other 7 difficult lesions were greater than 3mm (24%) and in these cases the difficulty was related to the nature of the lesion. Erosion with stepwise depression was the easiest lesion to diagnose endoscopically with 100% accuracy. Considering all aspects the overall diagnostic difficulty rate was 49%. This can mean whatever the appearance, size, pathology or localization of the lesion is, if there isn't any suspicion it is possible to miss approximately 50% of the minute gastric cancer lesions less than 5mm in diameter. Since recognition and endoscopic biopsy are the most reliable methods, the first step in recognition starts with being suspicious about the lesion. When suspected, other additional methods like staining and magnifying endoscopy can be applied. The final steps are obtaining specimens

from the suspected lesion and pathological diagnosis.

In 4 cases the malignant pathologic findings disappeared by biopsy. In 2 of these cases the diameters were obtained, but in the other 2 it wasn't possible. This is the other side of reality when the lesion is very small. You can diagnose correctly while you can't identify the size of the lesion. With further endoscopic and surgical methods the extent may be defined, but sometimes, like we experienced, detection is only made by biopsy and in these instances biopsy becomes a therapeutical procedure also.

CONCLUSIONS

1. Minute gastric cancer lesions located between the lower body and antrum are easy to detect, while possibly lesions in the other parts of the stomach are missed (especially depressed lesions).
2. Erosions with stepwise depression are easy to diagnose while ulcer scar like and erythema like lesions are difficult to diagnose.
3. Protruded type lesions are detected easily by their appearances, but are difficult to diagnose when their nature is considered.
4. Lesions which are less than 3mm in diameter are difficult to diagnose.
5. There is no relation between the endoscopic appearance and the pathologic diagnosis of the lesions.
6. Surrounding mucosal edema can be a clue for easy detectability.
7. Although the number of cases are low, we can say that the diagnostic accuracy of minute gastric cancer is 51%.

REFERENCES

1. Morson and Dawson's Gastrointestinal Pathology, Third Edition; Blackwell Scientific Publications, Oxford-London, 1990:154-66.
2. Iishi H, Tatsutta M, Okuda S. Endoscopic Diagnosis of Minute Gastric Cancer Less than 5mm in Diameter. *Cancer*, 1985; 56:655-9.
3. Takahashi H, Fujita R, Takakura H, et al. Differentiation Between Benign Erosion and Minute Gastric Cancer by Magnifying Endoscopy. *Progress of Digestive Endoscopy* 1987; 31: 34-7 (In Japanese with English abstract).
4. Oguro Y. Endoscopic Treatment of Early Gastric Cancer. *Digestive Endoscopy* 1991; 3:3-15.
5. Ida K, Kohli Y, Shimamoto K, et al. Endoscopic Findings of Fundic and Pyloric Gland Area Using Dye Scattering Method. *Endoscopy* 1973; 5: 21-6.
6. Tatsuta M, Okuda S, Tamura H, et al. Endoscopic Diagnosis of Early Gastric Cancer by the Endoscopic Congo Red-Methylene Blue Test. *Cancer* 1982; 50: 2956-9.
7. Takahashi H, Kousen K, Seki M, Fujita R, Sugata F. Endoscopic Diagnosis of Minute Gastric Cancer. *Digestive Endoscopy* 1986; 29:134-7 (In Japanese with English abstract).
8. Oohara T, Aono G, Ukawa S, et al. Clinical Diagnosis of Minute Gastric Cancer Less than 5 mm in Diameter. *Cancer* 1984; 53: 162-5.