Five year follow-up study of gastritis

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SUMMARY This paper describes a five year follow-up study of the incidence and course of gastritis affecting the antrum and body of the stomach of 50 patients, most of whom presented with non-ulcer dyspepsia and a few with peptic ulceration.

We have shown that antral gastritis, like gastritis affecting the fundus, becomes more severe in a proportion of patients as time goes by. Perhaps more important is the increased severity and progression of atrophic and metaplastic change in the antrum compared with the fundus. The significance of these changes with regard to the development of peptic ulceration and malignancy is discussed.

During endoscopic examination of the stomach "gastritis," indicating a hyperaemic gastric mucosa with contact bleeding, or "atrophic gastritis," with thinning of the mucosa such that the submucosal vessels can be seen, are frequent observations.

These visual appearances of gastritis are an unreliable guide to the histological findings when tissue biopsies are taken. This became obvious when the advent of fiberoptic endoscopy with biopsy facilities allowed detailed histological studies of gastritis and its relation to disease.¹

The early studies were performed using rigid or semiflexible endoscopes and blind suction biopsy with the result that the precise origin of the biopsies was unknown, but most tissue samples were taken from along the greater curve of the body of the stomach. Using this technique, follow-up studies were made to assess the course of gastritis, attempting to correlate this with the development of ulcers and malignancy.²⁻⁴ From these studies little information was obtained about the incidence and natural history of gastritis affecting the antrum and lesser curve of the stomach.

The introduction of the flexible fiberoptic endoscope has enabled an accurate assessment to be made of the whole of the stomach and tissue biopsies can be taken repeatedly from standard sites.^{1,5}

In this study 50 patients had follow-up endoscopy examinations between five and eight years after an initial endoscopic assessment and biopsies. Standard site biopsies were taken on both occasions. The state of the gastric mucosa and any histological changes occurring in the period under review were correlated with social and clinical factors.

Patients and methods

All the patients in this study had dyspeptic symptoms at the time of the first endoscopy. A few of them had been referred for examination because of upper gastrointestinal bleeding.

Patients endoscoped and biopsied not less than five years previously, and recorded as having macroscopic gastritis but without any focal lesion being present, were asked to attend for a repeat examination and biopsy.

Of 93 patients contacted, 35 gave informed consent for re-examination. In addition, 10 patients found to have peptic ulcers at the time of the first endoscopy, and five with macroscopic duodenitis who had also had standard site biopsies taken, agreed to undergo a similar re-examination.

None of the patients concerned had undergone gastric surgery and none was being treated with cimetidine, although a few took antacids periodically. The patients completed a questionnaire detailing age, sex, present and past symptoms and cigarette and alcohol consumption. Endoscopy was performed under diazepam sedation and tissue biopsies were taken from each of four standard gastric sites—prepyloric, mid and high lesser curve and greater curve.¹ Blood samples for a full blood count and blood grouping were also taken.

The tissue biopsies were processed to paraffin wax and sections cut wherever possible at right angles to the surface of the mucosa. The sections were stained routinely with haematoxylin and eosin (H and E). The specimens were compared with those taken at the first and any intervening examinations. The earlier series of biopsies had been stained with periodic acid-Schiff (PAS) and also for reticulin in addition to the H and E stains.

In assessing the grade of gastritis the classification by Whitehead⁵ was used. Intestinal metaplasia is usually associated with the more severe grades of atrophic gastritis, but as it is occasionally found with superficial gastritis, or with otherwise normal mucosa, it was recorded separately. The grade of gastritis was decided without knowing the name of the patient, the site biopsies or whether it was an initial or second examination. Subsequently the two sets of biopsies were compared and assessed for changes. In cases where gastritis was demonstrated at either examination the grade and course of gastritis was determined and the findings correlated with information obtained from the questionnaires, hospital notes and barium meal examinations which had been performed in 47 of the 50 cases.

Results

Fifty patients were included in the study (12 women and 38 men) with ages ranging from 24–69 yr.

INITIAL FINDINGS

Gastritis was demonstrated in 37 cases on histological examination of the initial specimens. Thirteen cases had superficial gastritis and 24 had atrophic gastritis with almost universal antral involvement. In two cases where the antral mucosa showed no abnormality, the body of the stomach showed only minor gastritic changes. Gastritis was always found to be more severe in the antrum and in seven cases gastritis of varying degrees of severity was confined to the antrum. Eleven patients showed intestinal metaplasia at the first examination which was most commonly found in the distal stomach and along the mid-lesser curve.

FINDINGS AT FOLLOW-UP

In 11 of the cases where the mucosa was normal it remained so. None of these patients had evidence of peptic ulceration at any time. In two patients with normal mucosa on initial examination, gastritis was subsequently demonstrated with no evidence of peptic ulceration. Five patients showed modest diminution in the severity of the gastritis and two returned to normal despite the fact that one of these had a deformed duodenal cap.

In 18 patients gastritis of varying severity remained unchanged. This group included three patients proven to have had gastric ulcers and one a duodenal ulcer. In addition, two patients were originally recorded as having duodenitis on visual assessment with active duodenal ulceration demonstrated at the time of the review endoscopy. All of the remaining 14 patients had progressive gastritis. In the majority of cases this was reflected by more

severe gastritis in areas already affected by the disease, but in three there was proximal spread to gastritis to involve body mucosa which previously had appeared normal. Duodenal ulcers had been recorded in four cases, gastric ulcers in two and duodenitis with subsequent ulceration in one case at the first examination.

In patients with gastritis the average severity of mucosal disease varied little whether there had been proven peptic ulceration or not.

LOCAL CHANGES IN GASTRITIS

Antral and body mucosa was analysed separately in all patients. Tables 1 and 2 both summarise a comparison of four pairs of biopsy specimens taken from each of the 50 patients, producing an overall assessment of the antral (Table 1) and body (Table 2) mucosa. In Table 1 it can be seen that seven cases developed atrophic change and three intestinal metaplasia affecting the antrum. Table 2 shows that intestinal metaplasia spread to involve the body of the stomach in three cases. There was little overall change in the incidence of gastritis, but existing gastritic change became worse in some individuals. Patients were then considered individually to see whether the course of gastritis in the body of the stomach reflected that in the antrum. In general, the gastritis affecting the body remained static or worsened in parallel with the antral gastritis. In four cases antral gastritis improved despite static or worsening body gastritis. However, we believe more cases are required to answer this problem.

In this series, gastritis tended to be more severe in the older patients and none showed dysplastic changes. However, cigarette consumption, drug ingestion, blood group and apparent severity of symptoms bore no relation to the degree of gastritis observed. None of the patients was anaemic.

Discussion

The incidence and course of gastritis affecting the body of the stomach has been extensively studied, but comparatively little is known about the course of gastritis involving the antrum of the stomach.

Siurala⁴ reported the development of malignancy in nine of 100 patients with atrophic body gastritis, many of whom also had intestinal metaplasia, over a 20-year period. Because of the limitations of his technique the tissue samples in this series came from the greater curvature of the body of the stomach. In the present survey the whole of the stomach and duodenum were examined and biopsies taken from standard sites including the pyloric antrum. While different grades of gastritis can be distinguished there are inevitably sampling errors and subjective

Table 1 *Histological diagnosis—antrum*

	Second examination—worse				
	Normal	Mild	Moderate/severe	Atrophic	Intestinal metaplasia
<i>First examination—better</i>					
Normal	25	1	3	7	3
Mild	2	4	1		
Moderate/severe	2	2	21		
Atrophic	1			17	
Intestinal metaplasia	1				9

The totals do not add up to the number of patients (50) as more than one diagnosis was made on some of the biopsies.

Concurrence rate	76	76.8%
Better	8	8.1%
Worse	15	15.1%
Total	99	100.0%

Table 2 *Histological diagnosis—body*

	Second examination—worse				
	Normal	Mild	Moderate/severe	Atrophic	Intestinal metaplasia
<i>First examination—better</i>					
Normal	32	1		2	3
Mild		7	6		
Moderate/severe	1	1	10		
Atrophic				15	
Intestinal metaplasia					2

The totals do not add up to the number of patients (50) as more than one diagnosis was made on some of the biopsies.

Concurrence rate	66	82.5%
Better	2	2.5%
Worse	12	15.0%
Total	80	100.0%

variations in assessment. In this study we took two biopsies from each of the four standard sites, having previously shown this to provide a reliable sampling method, in order to gain as representative a picture of the state of the gastric mucosa as possible.¹ Furthermore, experience has shown that the use of these four standard sites allows a good overall impression of the gastric mucosal status.

This study confirms that antral gastritis is commoner and tends to be more severe than gastritis affecting the body of the stomach. When the patient has had a peptic ulcer antral gastritis is invariably present, although gastritis affecting the body is not.

It also appears that atrophic change occurs more often in the antrum than the body of the stomach (Tables 1 & 2). Our figures do not show this convincingly. Atrophy was commoner in the antrum overall, but established gastritis in the body was almost as likely to get worse. Only a small minority of patients with normal mucosa developed gastritis during the follow-up period averaging six years. This gastritis regressed in a few of the cases but in most individuals the degree and extent of gastritis either remained static or tended to progress. The cause may be some inherent defect in the mucosa or due to damage produced by alcohol, smoking, transpyloric reflux or immunological processes.⁶⁻⁹

This study confirms the generally accepted fact that intestinal metaplasia is most frequently found in the pyloric region. Studies of Morson¹⁰ and Siurala^{2,4} suggest that atrophic change, and particularly intestinal metaplasia, are premalignant conditions, although mucosal change, particularly of the pylorus and lesser curve, is also associated with benign peptic ulceration. Hebbel¹¹ found antral metaplastic change in 11% of necropsies on patients with no history of gastroduodenal disease.

We detected intestinal metaplasia in 11 of our 50 patients (22%) and in eight of these cases there was nothing to suggest peptic ulceration at any stage. Moreover, three cases developed intestinal metaplasia during the period of follow-up and in three it had extended from the antrum to the body mucosa.

Mass visual screening by endoscopy has been suggested as a means of detecting early and, hopefully, curable gastric cancer.¹² We suggest that endoscopic tissue biopsy is the only way to define the population at risk of developing malignant change. Intestinal metaplasia and severe atrophy are easily recognised histologically but these changes are often patchy in distribution. We detected four early gastric carcinomas in patients who had had a partial gastrectomy. All these patients, who were not included in this study, showed intestinal metaplasia and atrophy

in the mucosa which is thought to be a premalignant change.^{2,4,10} Therefore, multiple antral biopsies as an extension of our present method would be an easy way to define the normal population and those at risk. Those found to have atrophy and intestinal metaplasia could be considered for follow-up, a suggestion which requires further study. A particular population at risk is those patients who had had previous gastric surgery, intestinal metaplasia and atrophy. There is now little doubt that, after 15 years or more, the risk of such patients developing a gastric malignancy is greater than in the normal population.¹³

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References

- ¹ Gear MWL, Truelove SC, Whitehead R. Gastric ulcer and gastritis. *Gut* 1971;12:639-45.
- ² Siurala M, Seppala K. Atrophic gastritis as a possible precursor of gastric carcinoma and pernicious anaemia. *Acta Med Scand* 1960;166:455-74.
- ³ Siurala M, Salmi HJ. Long-term follow-up of subjects with superficial gastritis on a normal gastric mucosa. *Scand J Gastroenterol* 1971;6:459-63.
- ⁴ Siurala M, Varis K, Wiljasalo M. Studies of patients with atrophic gastritis: a ten to fifteen-year follow-up. *Scand J Gastroenterol* 1966;1:40-8.
- ⁵ Whitehead R, Truelove SC, Gear MWL. The histological diagnosis of chronic gastritis in fiberoptic gastroscope biopsy specimens. *J Clin Pathol* 1972;25:1-11.
- ⁶ Roberts DM. Chronic gastritis, alcohol and non-ulcer dyspepsia. *Gut* 1972;13:768-74.
- ⁷ Delaney JP, Broadie TA, Robbins PL. Pyloric reflux gastritis: the offending agent. *Surgery* 1975;6:764-72.
- ⁸ Strickland RG, Mackay IR. A reappraisal of the nature and significance of chronic atrophic gastritis. *Am J Dig Dis* 1973;18:426-40.
- ⁹ Vandelli C, Bottazzo GF, Doniach D, Franceschi F. Auto antibodies to gastrin-producing cells in antral (type B) chronic gastritis. *N Engl J Med* 1979;300:1406-10.
- ¹⁰ Morson BC. Carcinoma arising from areas of intestinal metaplasia in the gastric mucosa. *Br J Cancer* 1955;9:377-85.
- ¹¹ Hebbel R. Chronic gastritis. Its relation to gastric and duodenal ulcer and to gastric carcinoma. *Am J Pathol* 1943;19:43-71.
- ¹² Anonymous. Screening for gastric cancer in the West. *Lancet* 1978;1:1023-4.
- ¹³ Stalsberg M, Taksdal S. Stomach cancer following gastric surgery for benign conditions. *Lancet* 1971;2:1175-7.

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