奈医誌. (J. Nara Med. Ass.) 41, 76～81, 平2

THE INCIDENCE OF PEPTIC ULCER SURGERY BEFORE AND AFTER THE INTRODUCTION OF H2-RECEPTOR ANTAGONISTS

SHINJI YASUDA*, TORU OKUMURA*, RYUICHI HIGASHIGUCHI*, ATSUSHI IMAGAWA*, MANNOSUKE YAKURA*, TOSHIFUMI KANAIZUMI** and HIROSHIGE NAKANO**

Department of Surgery, Saiseikai Chuwa Hospital

**First Department of Surgery, Nara Medical University*

Received January 31, 1990

Summary: Since the introduction of H2-receptor antagonists, the incidence of ulcer surgery has decreased markedly. Based on the number of patients who underwent ulcer surgery and upper gastrointestinal endoscopy in our hospital, the number of operations for peptic ulcer disease has decreased, although the number of peptic ulcer patients diagnosed by endoscopy has increased after the introduction of cimetidine (the first H2-receptor antagonist in Japan). The decreasing rate of surgical therapy before and after the administration of H2-receptor antagonists was 49.1%. The number of emergency operations has also decreased among ulcer patients diagnosed by endoscopy although the number of perforated and bleeding ulcer patients has increased. It is also reported that the most common operative procedure for both gastric and duodenal ulcer was distal gastrectomy reconstructed by gastroduodenostomy (Billroth I).

Index Terms

peptic ulcer surgery, H2-receptor antagonists

INTRODUCTION

Since the introduction of H2-receptor antagonists, a marked decrease in the incidence of elective surgery and no significant decrease in the number of operations for perforated or bleeding ulcer have been reported[1)-6)]. In the Japanese literature too, it is reported that the number of operations, which include emergency surgery, has clearly decreased and the incidence of operation for perforated ulcer has not decreased[7),8)]. However, recently the number of patients with peptic ulcer in Japan has gradually increased[9)]. Endoscopic examination in our hospital also showed that the number of ulcer patients has increased. The aim of this study was to clarify the actual condition of peptic ulcer before and after the introduction of cimetidine and also to discuss the treatment of peptic ulcer disease.

PATIENTS AND METHODS

From 1977 to 1982, 3,940 patients were diagnosed as having peptic ulcer by upper gastrointestinal endoscopy, and 368 of them underwent ulcer surgery in Saiseikai Chuwa Hospital (323 Abe, Sakurai-city, Nara-prefecture, Japan). The ages of the patients who underwent endoscopy ranged from 8 to 92 years, with a mean of 49.7 years. The male to female ratio was 3.0 : 1. Patients who underwent ulcer surgery were not always examined by endoscopy in our hospital. On the other hand, the ages of the

patients who underwent surgery ranged from 15 to 91 years, with a mean of 44.3 years. The male to female ratio was 4. 2 : 1.

The trend for the incidence of surgery was calculated based on the number of patients whose diagnosis of ulcer was confirmed by upper gastrointestinal endoscopy from 1977 to 1987 in our hospital. The total number of operations performed between 1977 and 1981 was compared with that between 1983 and 1987. The number of operations in 1982 was excluded, because the year 1982 was considered to be the year for the turning point of ulcer medication.

For statistical evaluation of differences, Student's t test and chi square test were used. Statistical significance was accepted at the 5% level.

RESULTS

The incidence of patients with peptic ulcer dianosed by upper gastrointestinal endoscopy was almost constant, but increased in those three years (Fig. 1). In 3,940 ulcer patients diagnosed by endoscopy during the study period, 2,617 had gastric ulcer (66.4%), 828 had duodenal ulcer (21.0%) and 495 had gastric and duodenal ulcer (12.6%). However, the number of ulcer operations gradually decreased after the introduction of H2-receptor antagonists (Fig. 2). Of the 368 patiens who underwent surgery, 187 had gastric ulcer (50.8%), 157 had duodenal ulcer (42.7%) and 24 had gastric and duodenal ulcer (11.7%).

The total number of operations before and after H2-receptor antagonist therapy was 220 and 112, respectively. The decreasing rate of peptic ulcer operation before and after H2-receptor antagonist therapy was 49.1%. This was statistically significant. During the period before H2-receptor antagonist therapy, the number of operations for gastric ulcer was 122. On the contrary, the number after H2-receptor antagonist therapy was only 44. This was a statistically significant decrease. The number of operations for duodenal ulcer was much greater than that of gastric ulcer in recent years. The operation rate of peptic ulcer has decreased markedly after the introduction of H2-receptor antagonists (Fig. 3). As far as the complication of peptic ulcer is concerned, bleeding in gastric ulcer and perforation in duodenal ulcer are the most significant. Nevertheless, the rate of complication decreased

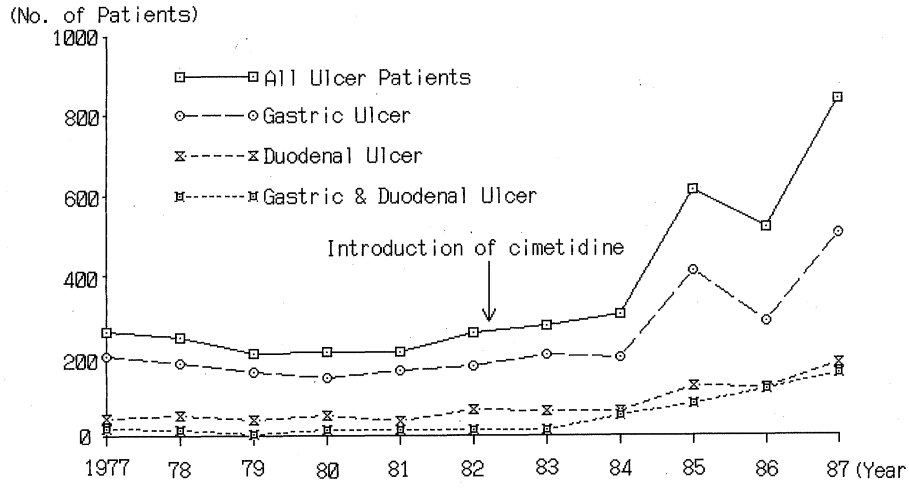

Fig. 1. Number of ulcer patients diagnosed by endoscopy.

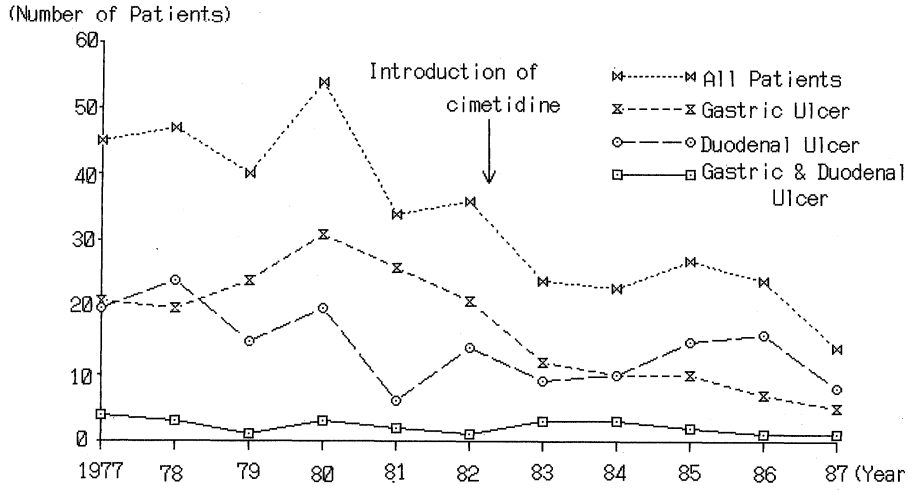

Fig. 2. Number of ulcer surgery.

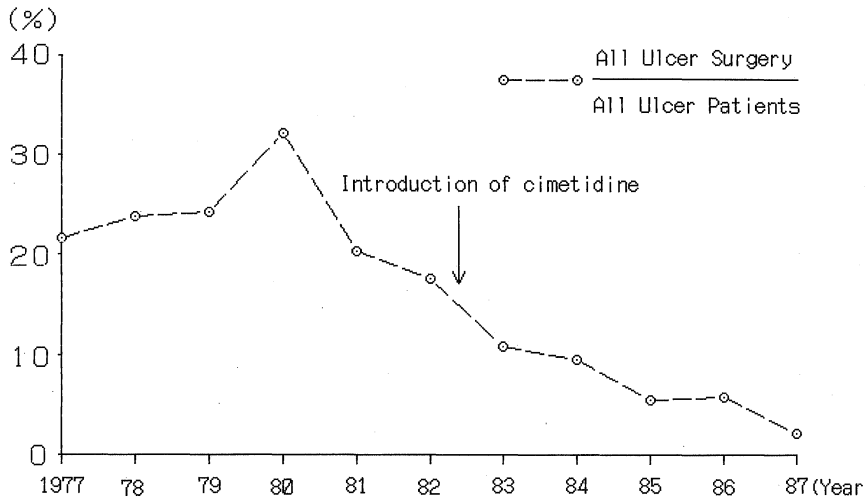

Fig. 3. The operation rate of peptic ulcer.

among ulcer patients diagnosed by endoscopy. However it has increased among the patients who underwent surgery (Table 1).

The method of operation performed on almost all the peptic ulcers, which include both gastric and duodenal ulcers, was distal gastrectomy reconstructed by gastroduodenostomy or gastrojejunostomy. In the case of perforated ulcer too, distal gastrectomy was usually performed. In 289 of 368 ulcer operations (78.5%), distal gastrectomy was reconstructed by gastroduodenostomy, and in 63 of 368 (17.1%) reconstructed by gastrojejunostomy. Only one patient who had reconstruction by gastroduodenostomy (0.3%) showed recurrence and thus the patient was reconstructed by gastrojejunostomy.

DISCUSSION

In Western countries, the frequency of peptic ulcer seemed to have reached its peak frequency in the middle of the 1950's and duodenal ulcer was more common than gastric ulcer between the First and Second World Wars[10]. In Japan, the incidence of gastric ulcer was 314.5 per 100,000 inhabitants in 1970 and 500.0 per 100,000 in 1984, while the incidences of duodenal ulcer were 148.3 and 204.5 respectively[9]. These results suggest that peptic ulcer did not seem to have reached its peak in Japan. In our hospital, peptic ulcer showed an increase in frequency in recent years and gastric ulcer was more common than duodenal ulcer throughout the study period.

As for ulcer surgery, Nagao and associate reported the results of an investigation from 452 hospitals in Japan from 1977 to 1986[11]. According to one of their results, as shown in Table 2, the decreasing rate of surgery was 43.3%. During the period after H2-receptor antagonist therapy, bleeding in gastric ulcer and perforation in duodenal ulcer were also significant complications. In recent years, more than half of the operations in Japan were performed due to bleeding of perforation. It was due to the trend that many peptic ulcer patients, when advised to have surgical treatment, refused on the ground that they would prefer to continue with cimetidine therapy[12]. Consequently, the indications of operation for peptic ulcer disease after H2-receptor antagonist therapy is indicated only when there is gastric outlet obstruction and perforation. H2-receptor antagonists have made the peptic ulcer operation a less

Table 1. The incidence of operation for bleeding and perforated gastric and duodenal ulcer before and after H2-receptor antagonist therapy (H2-RA)

		Before H2-RA(1977-81)		After H2-RA(1983-87) (Among operation/ulcer patients (%))	
Gastric ulcer	Bleeding	18	(14.8/2.1)	16	(36.4*/1.0*)
	Perforation	2	(1.6/0.24)	2	(1.4/0.13)
Duodenal ulcer	Bleeding	7	(8.2/3.2)	2	(3.4/0.37*)
	Perforation	17	(20.0/7.8)	19	(32.8/3.5*)
Total	Bleeding	25	(12.1/2.3)	18	(17.6/0.84*)
	Perforation	19	(9.2/1.8)	21	(20.6*/0.98)

*: Statistically significant

Table 2. The number of ulcer operation and the incidence of emergency operation before and after H2-receptor antagonist therapy (H2-RA)

		Before H2-RA(1977-81)	After H2-RA(1983-87)
Gastric ulcer		24,775	12,744
	Bleeding (%)	31.8	53.9*
	Perforation (%)	7.3	14.2*
Duodenal		19,993	12,638
	Bleeding (%)	12.9	15.8*
	Perforation (%)	30.6	47.6*
Total		44,768	25,382
	Bleeding (%)	23.3	34.9*
	Perforation (%)	17.7	30.8*

*: Statistically significant

frequent and a more difficult one. In controlled trials to compare the value of H2-receptor antagonist therapy or operation, Anderson et al reported that the cumulative operation rate was more than 50% in patients treated with cimetidine within 24 months after initial treatment[13),14)] They also advocated that the difference in economic consequences between a more active and a more conservative treatment scheme is so small, though the cimetidine therapy is found to be less expensive than surgery in previous reports[15),16)]. The most important problem in peptic ulcer treatment is the so called "refractory" ulcer. Some controlled trials have been performed and the limit of conservative therapy for peptic ulcer has become clear[17)-19)]. Appropriate judgment of prognosis of refractory peptic ulcer is now required.

The methods of operation for perforated peptic ulcer from the 1940's to 1970's in Japan have been precisely reported by Kaku[20)]. The most common operative procedure for perforated peptic ulcer was extensive gastrectomy, which was responsible for 87.3% of ulcer surgery. Simple closure was only 7. 6% and vagotomy with or without partial gastrectomy was 3.1%, although these procedures were popular in Western countries[21)].

In conclusion, the number of elective and emergency operations for peptic ulcer has been decreasing after the introduction of H2-receptor antagonists, although the number of peptic ulcer patiens has been increasing in Japan. This is thought to be the effect of H2-receptor antagonists. However, the problem of refractory ulcer remains. A more precise study of total treatment for peptic ulcer is required.

REFERENCES

1) **Smith, M.P.**: Decline in dundenal ulcer surgery. JAMA. **237**: 987-988, 1977.
2) **O'Connor, P.C., Griffiths, K.** and **Shanks, R.G.**: Trends in peptic ulcer related diseases from 1972 to 1980. Eur. J. Clin. Pharmacol. **24**: 435-440, 1983.
3) **Thompson, J.C.**: The role of surgery in peptic ulcer. N. Engl. J. Med. **307**: 550-551, 1982.
4) **Christensen, A., Bousfield, R.** and **Christiansen, J.**: Incidence of perforated and bleeding peptic ulcers before and after the introduction of H2-receptor antagonists. Ann. Surg. **207**: 4-6, 14988.
5) **Schein, M., Saadia, R.** and **Decker, G.A.G**: Perforated peptic ulcer at the J.G. Strijdom Hospital. SAMJ. **70**: 21-23, 1986.
6) **Mckay, A.J.** and **McArdle, C.S.**: Cimetidine and perforated peptic ulcer. Br. J. Surg. **69**: 319-320, 1982.
7) **Taniguch, K., Oshima, K., Endo, S., Konishi, R., Asae, M., Ono, K., Oka, S., Fukunaga, H., Yamamoto, S., Yamamoto, T., Kono, N.** and **Katsumi, M.**: Trends of surgical treatment for Gastroduodenal ulcer after introduction of cimetidine. Jpn. J. Gastroenterol. Surg. **18**: 1980-1986, 1985 (in Japanese).
8) **Setsu, Y., Matsubara, Y., Tamiya, Y., Takakuwa, K., Matsuo, H., Yoshida, M., Kato, T., Miura, K., Nakamura, S.** and **Muto, T.**: Clinical studies on perforated peptic ulcers in Niigata City. Jpn. J. Gastroenterol. Surg. **20**: 2508-2515, 1987 (in Japanese).
9) **Watanabe, Y.** and **Kawai, K.**: Epidemiological study on peptic ulcer in Japan and H2-blockers. Digestive disease seminar 28, Health Publish Co. Inc., Tokyo, p. 7-16, 1987 (in Japanese).
10) **Langman, M.J.S.**: What is happening to peptic ulcer? Br. Med. J. **284**: 1063-1064, 1982.
11) **Nagao, F.** and **Aoki, T.**: Changes in clinical features of peptic ulcer disease in the surgical practice. Digestive disease seminar 28, Health Publishing Co. Inc., Tokyo, 1987 (in Japanese).
12) **Penn, I.**: The declining role of the surgeon in the treatment of acid-peptic diseases. Arch. Surg. **115**: 134 -135, 1980.
13) **Anderson, D., Amdrup, E., Sϕrensen, F.H.** and **Jensen, K.B.**: Surgery or cimetidine? I. Comparison of two plans of treatment: operation or repeated cimetidine. World J. Surg. **7**: 372-377, 1983.

14) **Anderson, D., Amdrup, E., Sørensen, F.H.** and **Jensen, K.B.**: Surgery or cimetidine? II. Comparison of two plans of treatment: operation or cimetidine given as a low maintenance dose. World J. Surg. **7**: 378-384, 1983.

15) **Jonsson, B.**: The social cost of peptic ulcer in Sweden. Scand. J. Gastroenterol. (Suppl.) **63**: 181, 1980.

16) **Culyer, A.J.** and **Maynard, A.K.**: Cost-effectiveness of duodenal ulcer treatment. Soc. Sci. Med. **15**: 3-8, 1981.

17) **Pounder, R.E.**: Duodenal ulcers that will not heal. Gut **25**: 697-702, 1984.

18) **Bardhan, K.D.**: Refractory duodenal ulcer. Gut **25**: 711-717, 1984.

19) **Quatrini, M., Basilisco, G.** and **Bianchi, P.A.**: Treatment of 'cimetidine-resistant' chronic duodenal ulcers with ranitidine or cimetidine: a randomized multicentre study. Gut **25**: 1113-117, 1984.

20) **Kaku, N.**: A statistical analysis of perforated Gastric and Duodenal Ulcers in Japan during the past 40 years. Kurume Med. J. **33**: 7-4, 1986.

21) **Jordan, Jr, G.L., DeBakey, M.E.** and **Duncan, Jr, J.M.**: Surgical management of perforated peptic ulcer. Ann. Surg. **179**: 628-633, 1974.