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The Prognostic Significance of Subserosal and Serosal Extent of Cancer Invasion in Gastric Cancer

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ABSTRACT : In order to determine the prognostic significance of subserosal and serosal extent of cancer invasion in gastric cancer, 78 patients were reexamined histologically. In these patients curative resection was performed and cancer invaded the subserosal layer with growth pattern of infiltrating type i. e. "ss γ " (30 patients), or exposed outside the serosal surface i. e. "se" (48 patients). The significantly favourable prognosis was seen only in patients with ssr cancer being less than 1 cm in extent with a five-year survival rate of 92.3%, and in patients with small amount of cancer cells in the subserosal layer, having a five-year survival rate of 81.8%. In patients with se cancer the five-year survival rate was less favorable.

INTRODUCTION

It is widely recognized that the serosal factor is one of the most important factors influencing the prognosis of gastric cancer patients because the serosal invasion is directly related to a subsequent peritoneal carcinosis which is the most common mode of recurrence. The present study was undertaken to determine the influence of the serosal factor in patients with gastric cancer which involved the subserosal wall with infiltrating fashion or was exposed outside the serosa based on the microscopic finding of the surgical specimens obtained after curative surgical resection for gastric cancer.

MATERIALS AND METHODS

Of gastric cancer patients who underwent

curative resection at the First Department of Surgery, Nagasaki University Hospital, in a period between January 1973 and December 1982, 30 cases of ss γ cancer and 48 cases of se cancer were histologically reexamined. The paraffin-embedded specimens stained with hematoxylin and eosin were used for this study, and the following items were examined in relation to the patients' prognosis : the extent of cancer in the deepest layer, mode of extension in the subserosal layer, quantity of cancer cells, and histologic type of cancer in the front of cancer invasion of the deepest area. The extents of cancer in the subserosal layer and on the serosal surface were determined by measuring the maximal length of the width of cancer invasion at each layer. As shown in Fig. 1, the modes of extension of cancer in the subserosal layer in both ss γ and se cancer patients were divided into the following three types : (1) valley type, in which cancer invasion is wider in

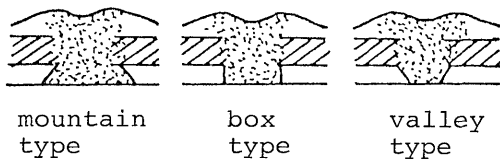


Fig. 1

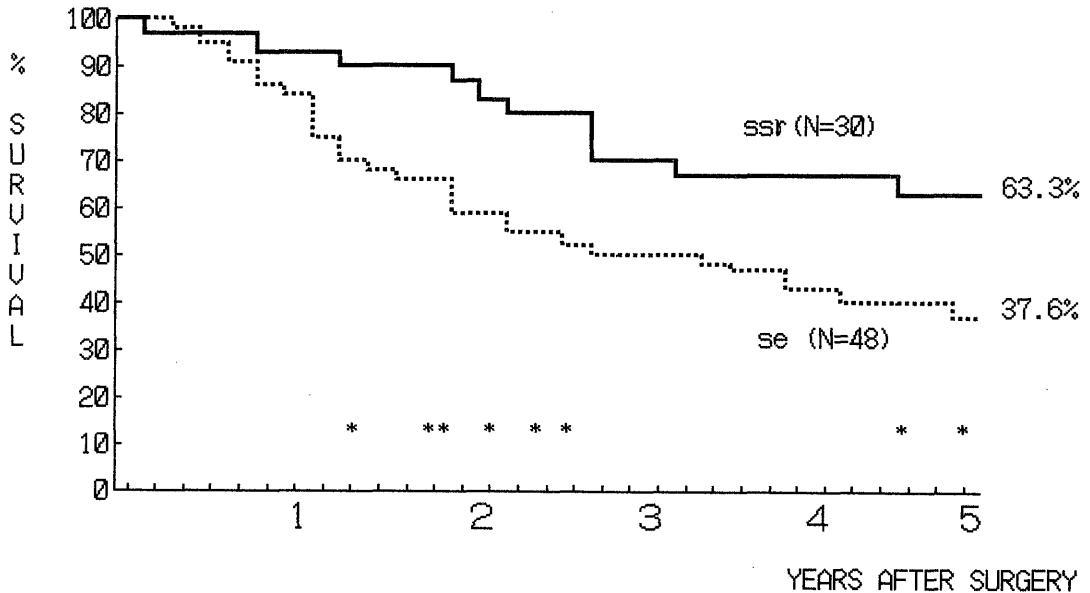
the shallow area of the subserosal layer than in the deeper area, (2) mountain type, opposite to the valley type, (3) box type, in which extent of cancer invasion at the shallow area of the subserosal layer is almost the same as at the deep area. The amount of cancer cells at the subserosal layer or serosal surface was determined and graded from (+) to (+++). Histologic types of cancer in the deepest area were also examined and divided either into differentiated carcinoma or into undifferentiated carcinoma. The patients' prognosis was analyzed in relation to these items. Terms appearing in this paper are used according to the general rules for the gastric cancer study in surgery and pathology by Japanese Research Society for Gastric Cancer¹⁾.

The survival rates were calculated with Kaplan & Meier's method, and generalized

Wilcoxon test was used for statistical analysis.

RESULTS

Fig. 2. shows the survival curves in ss γ and se patients in which the five-year survival rates were 63.3% and 37.6%, respectively. This difference was statistically significant ($p < 0.05$). The distribution of patients with ss γ and se cancers according to the cancer extent in the subserosal layer and on the serosal surface is demonstrated in Fig. 3. The cancer extent in ss γ patients was 16mm on the average, ranging from 1 to 70mm; and that in se patients was 11mm on the average, ranging from 1 to 77 mm. In the cases of ss γ , the cancer extent less than 10mm was seen in 43% of the patients, 10-19mm in 30%, and more than 20mm in 27%. In the cases of se, the cancer extent less than 10mm was seen in 65% of the patients and that of 10-19mm in 15%, and more than 20mm in 21%. Fig. 4 shows the five-year survival curves of each group. The significantly favorable prognosis was observed in patients with ss γ of extension less than 10mm (92.3%) than in those with ss γ above 10mm. The patients with ss γ cancer less than 10mm in extent and patients with se cancer



*: $p < 0.05$, ***: $p < 0.01$

Fig. 2

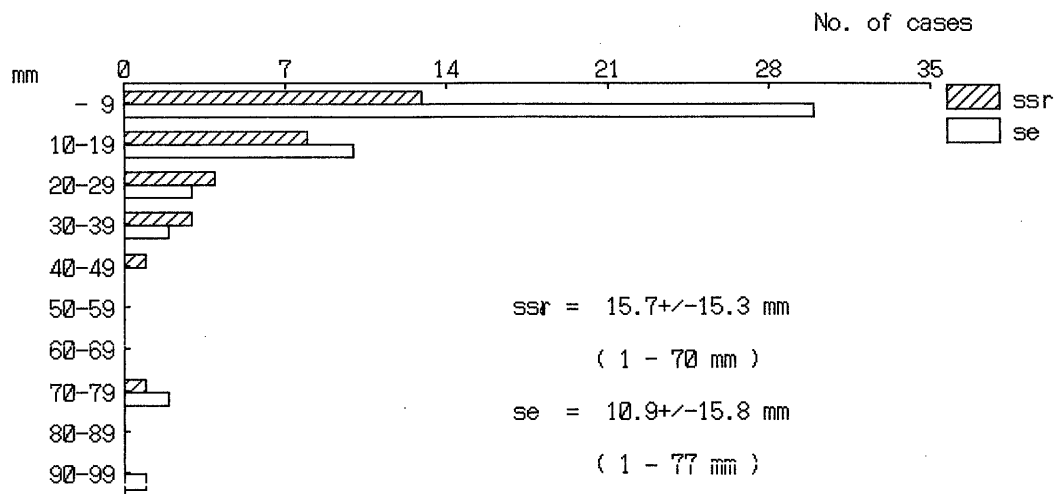


Fig. 3

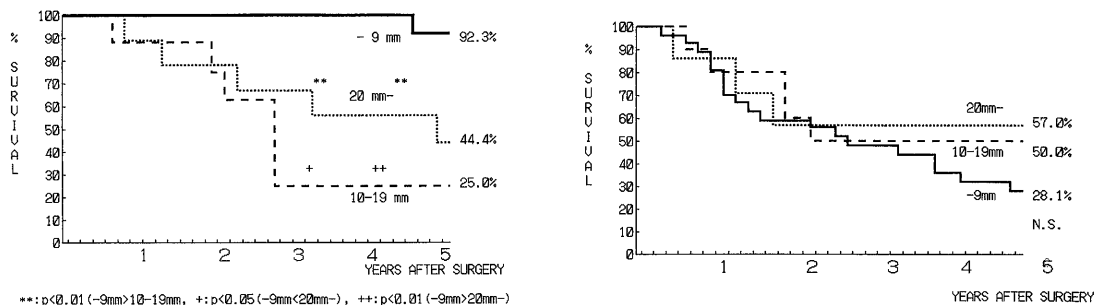


Fig. 4a and 4b

cancer had five-year survival rates from 57.0% to 30.8%.

The valley type was the most common type

of growth pattern in both ssr and se patients, comprising 91%, followed by the box type, comprising 9%. As shown in Fig. 5, there were %

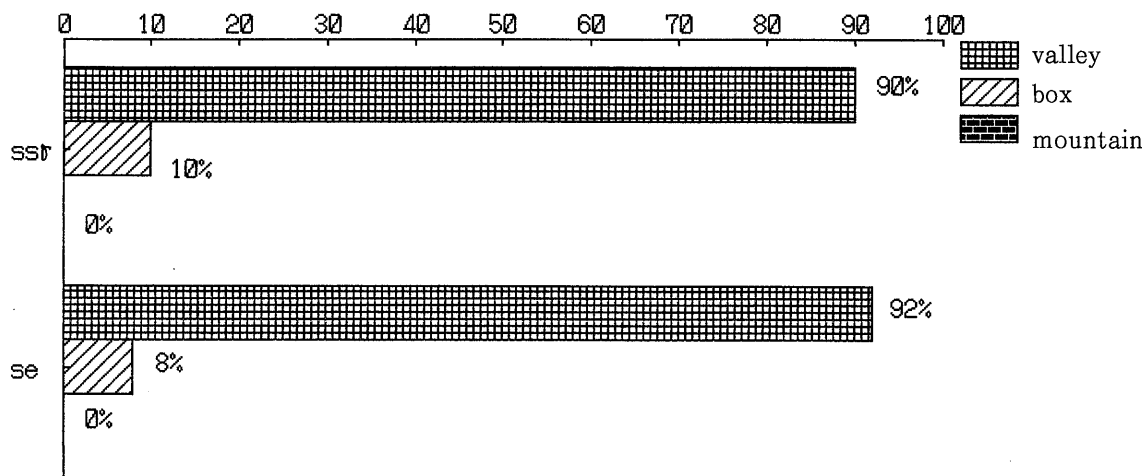


Fig. 5

no cases of the mountain type. In *ss* γ patients the valley type was seen in 90%, and the box type in 10%. A similar incidence was noted in *se* patients: the valley type in 92% and the box type in 8%. The comparison of the survival curves of the valley type and box type was shown in Fig. 6. Although the five-year survival rate of 50.2% of the valley type was better than that of 28.5% of the box type, there was no significant difference between the two groups.

Fig. 7 shows the patients' distribution

according to the amount of cancer cells in the subserosal layer and on the serosal layer. The incidences of small (+), medium (++) and large (+++) amounts of cancer cells in *ss* γ patients were 37%, 63%, and 0%, respectively; 52%, 35%, and 13%, respectively in *se* patients. The five-year survival rates of *ss* γ patients, as shown in Fig. 8 (a and b), were 81.8% in (+), 47.4% in (++) and this difference was statistically significant ($p < 0.05$). In *se* patients, however, the survival rate of the patients with (+) did not differ significantly from that of

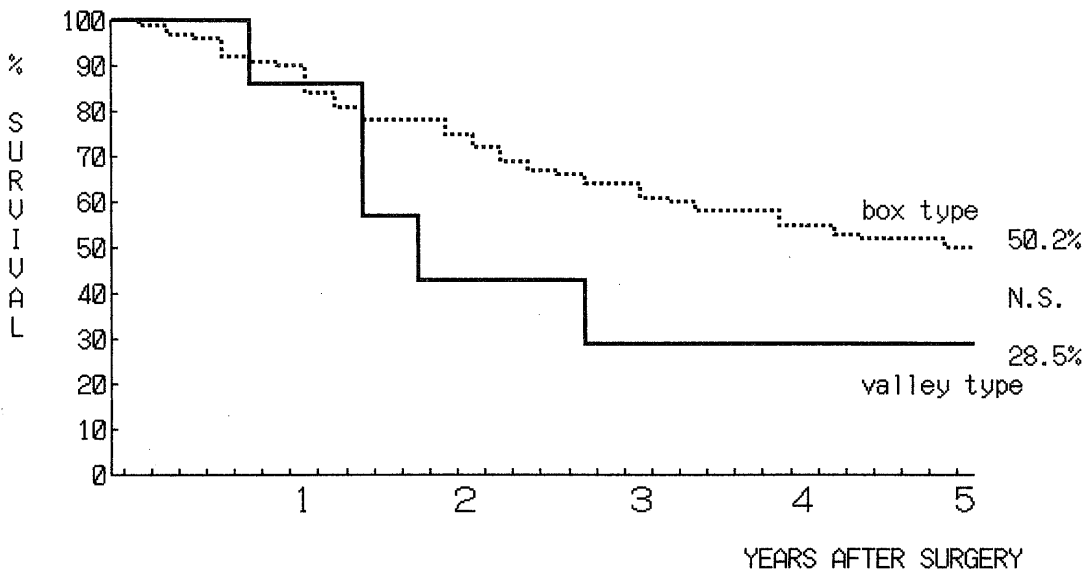


Fig. 6

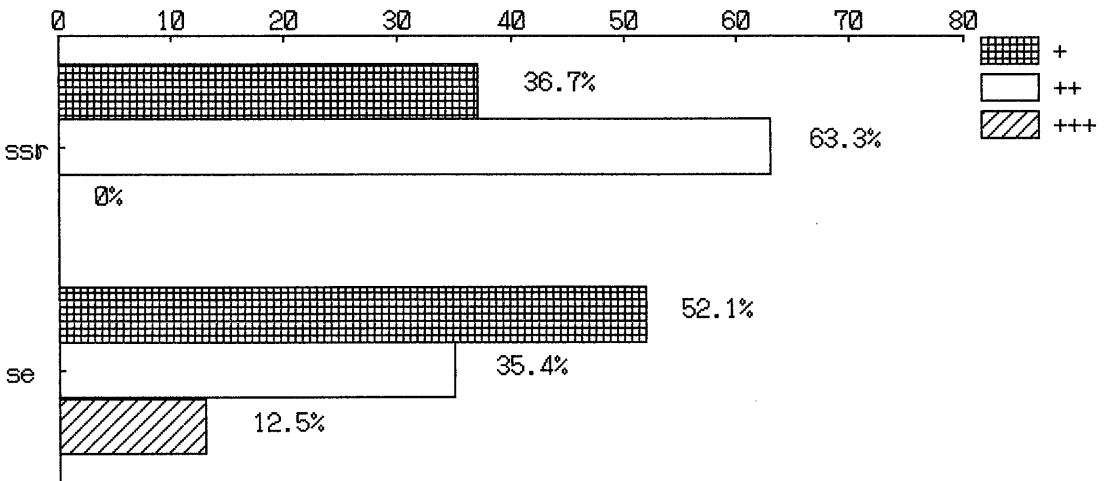


Fig. 7

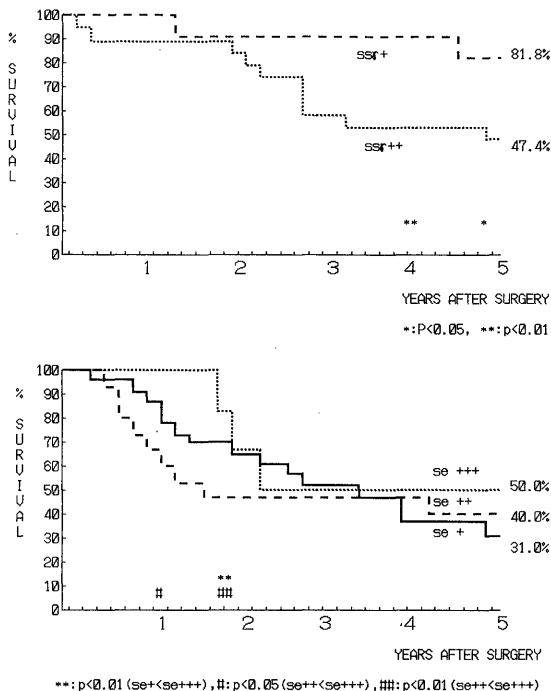


Fig. 8

patients with (++)

Fig. 9. reveals the survival curves according to the major histologic types in the deepest area. No significant difference was seen between

30.8% of the five-year survival rate in differentiated adenocarcinoma and 52.1% in undifferentiated adenocarcinoma.

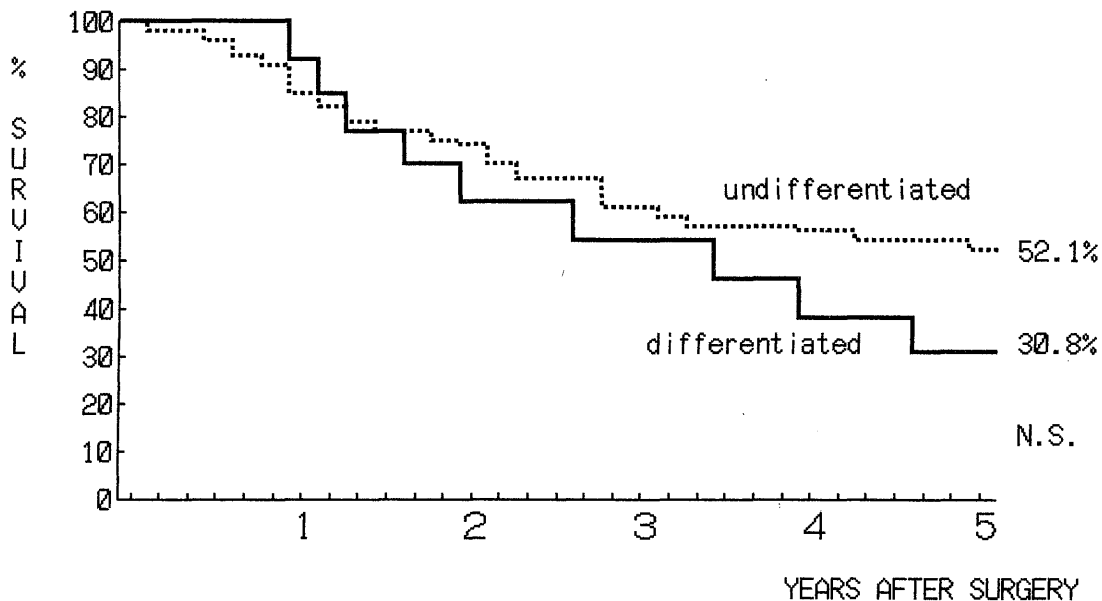


Fig. 9

DISCUSSION

Serosal factor is one of the most important prognostic factors in gastric cancer patients. With the increasing extent of cancer invasion outside the serosa, free cancer cells are more frequently detected by a cytologic examination of ascites and this leads to peritoneal dissemination at a high recurrence rate²⁾. Therefore, an advocated staging system³⁾ based on the extent of serosal invasion is of theoretical interest, although such a staging is not widely in use. The positive cytologic test of ascites for free cancer cells has been believed to imply occult peritoneal carcinosis. The previous reports show that patients with serosal extent less than 20mm² had a positive rate of cytologic test of 5%, and this incidence was raised to 33% in 20cm² and more⁴⁾. Others reported that there were no cases of positive free cancer cells in the ascitic fluid in S₀ and S₁ patients, but 27% were positive in S₂ patients, and 65% in S₃ patients⁵⁾. In the present study, patients with ss γ with extent of cancer cells less than 10mm had a favorable prognosis, and the others including se cases had an unfavorable prognosis.

In the present study, the modes of cancer extent in the subserosal layer were divided into three types. The majority of the patients showed the valley type of extension. There was no significant difference in survival rates between the valley type and box type. Because the number of patients is limited and this kind of trial, to our knowledge, has not been done elsewhere, further evaluation will be required to reach a definite conclusion.

The amount of cancer cells in our study does not mean density and INF or growth pattern of the tumor. Only the group classified as (+) or small amount of cancer in ss γ patients showed a significantly better prognosis than the other groups. These results are of particular interest because of similarity to the above data in extension of cancer in the subserosal and serosal layer.

A previous study⁶⁾ shows that cancer of infiltrating type tends to invade more frequently outside the serosa than does that of localiz-

ed type. Kodama, *et al*⁷⁾ reported the surgical results according to the Lauren's classification and stressed the significance of extent of serosal invasion in cancer of diffuse type than in that of intestinal type.

In summary, 78 patients were reexamined histologically, in whom cancer invaded the subserosal layer with growth pattern of infiltrating type i. e. "ss γ " (30 cases), or was exposed outside the serosa i. e. "se" (48 cases). The significantly favorable prognosis was seen only in patients with ss γ cancer being less than 1cm in extent and in patients with small volume amount of cancer cells in the subserosal layer. In patients with se the five-year survival rate was less favorable.

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