A new method of extensive resection for gastric carcinoma: selective type III operation

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Subject headings stomach neoplasms/surgery; lymphatic metastasis; lymph node excision/method; life quality; survival rate; prognosis

INTRODUCTION

One of the most important factors related to the prognosis of progressive gastric carcinoma is the metastasis to lymph nodes. Since 1968, we have made researches on the lymphatic metastasis and the proper scope of resection of lymph node in progressive gastric carcinoma. On the basis of this research, we designed a new method of extensive radical operation with special reference to the resection of lymph nodes.

MATERIALS AND METHODS

Theoretical basis of selective D3 operation

Since 1968, we have studied comprehensively the lymphatic metastasis in gastric carcinoma in 181 patients and reviewed 1317 cases reported in literature[1,2]. There were 784 cases of carcinoma in gastric antrum, and the overall rate of lymphatic metastasis in stations 1 and 2 were 16.5%-58.1%. The rate of lymphatic metastasis in station 3 was group 12, 20.7%; group 14, 13.4%; group 10, 13.2%; group 15, 12.8%; group 13, 11.6%; group 11, 9.0%; group 2, 4.1%; and in station 4: group 16, 3.7%. There were 481 cases of carcinoma in the gastric body, the overall rate of lymphatic metastasis were 13.5%-60.4% in stations 1 and 2. The rate of lymphatic metastasis in station 3 was: group 12, 12%; group 13, 4.9%; group 14, 4.3%; group 15, 2.4%; and in station 4: group 16, 3.8%. There were 162 cases of carcinoma in gastric cardia, the overall rate of lymphatic metastasis in stations 1 and 2 were 8.1%-60.2%. The rate of lymphatic metastasis in station 3 was group 12, 7%; group 111, 5%; group 13, 2.5%; group 14, 15 and in station 4: group 16, 1%. There were 71 cases of carcinoma in the whole stomach, and the overall rate of lymphatic metastasis in stations 1, 2, 3 were 8.6%-80.3%.

According to the above results, in cases of progressive gastric carcinoma, the resection of only station 2 lymph nodes will result in incomplete resection of lymph node metastases, and if routine resection of station 3 lymph nodes is performed, the operational injury and postoperative complications will be increased, leading to unnecessary total gastrectomy. All these may influence the quality of post-operative life. On the basis of our study and with reference to the Japanese Clinical Pathological Standard for Gastric Carcinoma, we designed selective D3 operation.

The scope of lymph node resection in selective D3 operation

This operation is characterized by the routine resection of lymph nodes in stations 1 and 2, and high lymph nodes metastasis rate in station 3.

In the cases of carcinoma of gastric antrum, the lymph nodes in groups 3, 4, 5 and 6 in station 1 and groups 1, 7, 8 and 9 in station 2, and the groups 11, 12, 13, 14, 15 in station 3 should be resected. The groups 2 and 10 lymph nodes in station 2 and group 16 in station 4 should not be routinely resected, unless they are suspected to have metastasis. In the cases of carcinoma of gastric body, the lymph nodes in groups 3, 4, 5 and 6 of station 1 and groups 2, 7, 8, 9, 10 and 11 of station 2 and groups 12 and 13 of station 3 should be resected. The lymph nodes in groups 14 and 15 in station 3 and group 16 in station 4 are not routinely resected, unless they are suspected to have metastasis. In the cases of carcinoma of gastric cardia, the lymph nodes in groups 1, 2, 3 and 4 of station 1 and groups 5, 6, 7, 8, 9, 10, 11 and 110 of station 2, and groups 12 of station 3 should be resected. The lymph nodes in groups 13, 14, 15 and 111 of station 3 and group 16 of station 4 are not routinely resected, unless they are suspected to have metastasis.
RESULTS

Complications and mortality
In the 834 cases of gastric carcinoma treated from 1960 to 1982 in our hospital, the rates of complication treated with different operational modalities were D1 2.4% and D2 4.7%; and selective D3 6.7% and D3 6.7%, with no significant statistical difference ($P>0.05$). The mortality rates were D1 0.7% and D2 2.3%; and selective D3 2.1% and D3 6.7%, with no significant statistical difference ($P>0.05$).[3] No complications and death occurred. In the 216 cases of stage III carcinoma of gastric antrum and body treated from 1972 to 1989 with D2 or selective D3 in our hospital.

Survival time
In the 834 cases of gastric carcinoma from 1960 to 1982, no significant statistical difference was observed in the 243 stage I and II cases, whether treated with D1, D2 or selective D3. The 5-year survival rate were 2.8%, 49.2%, 68.3% and 83.8%, respectively in the stage III gastric carcinoma treated with D1 in 139 cases, D2 in 181 cases, selective D3 in 88 cases and D3 in 6 cases. The 5-year survival rate in cases treated with D3 and selective D3 were significantly higher than that of cases treated with D1 and D2 ($P<0.01$), but no significant difference was noted between cases treated with D3 and selective D3 ($P>0.05$). Among 216 cases of stage III gastric antrum and body carcinoma managed from 1975 to 1989 in our hospital. The 5-year survival rate was 35.7% in 114 cases treated with D2, and 56.3% in 102 cases treated with selective D3, difference was significant statistically ($P<0.01$).

DISCUSSION

Surgical resection is the treatment of choice for gastric carcinoma and the resection of lymph nodes is a very important part of the operation. To reduce the residual lymphatic metastasis as much as possible, we conducted a research into the lymph node metastasis of gastric carcinoma, and found that there was a close relationship between the site of tumor, the depth of invasion, the size of tumor and the biological behavior of the tumor. And there was a definite role of lymph node metastasis, except for the carcinoma involving the whole stomach.

Based on the research, we designed the selective D3 operation. This operation includes mainly: a. The complete resection of lymph nodes in stations 1 and 2, and those of higher rate of metastasis in station 3. b. As to the low lymph node metastasis rate of stations 3 and 4, whether they should be resected or not may be judged by if any metastasis was found during the operation in combination with the clinical pathological factors. No statistical difference of complication and mortality rate was noted between selective D3 and D1 and D2 modality. Long-term clinical practice showed that the selective D3 operation can significantly prolong the survival of stage III cases and part of the stage IV cases, with significant statistical difference from D1 and D2. No significant statistical difference in survival time was noted in comparison with D3, but the operational injury was less severe and unnecessary resection of whole stomach can be avoided in part of the selective D3 cases with better quality of post-operational life.

Through more than 20 years of practice, we consider the indications for selective D3 operation are: a. carcinoma with invasion to the serosa without involvement of liver and peritoneum; b. direct invasion to neighboring tissues and organs, which can be radically resected by combined resection; and c. minor metastasis to peritoneum close to the primary lesion and isolated metastasis to liver, which can be completely resected. Contraindications: a. carcinoma with invasion to mucosa and submucosa only. In case except there was metastasis to lymph nodes in station 3, D2 was used routinely; b. carcinoma involving whole stomach (>2 regions). If these lesions can be completely resected, D3 was used; and c. extensive metastases to liver and peritoneal cavity.

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