A Retrospective Study of Serial CEA Determinations in the Early Detection of Recurrent Colorectal Cancer*


In the past five years, routine CEA determinations have been carried out on all patients after curative operation for colorectal carcinoma. These patients also underwent a clinical follow-up examination in the Oncology Outpatient Department. In 86 patients, recurrence of a tumor was confirmed. In 31 cases, a second-look operation was carried out. The CEA determinations were retrospectively analyzed in these patients and correlated with the time the recurrence of the tumor was diagnosed. These results show that of 86 patients only 15 (17.4 per cent) had pathologic CEA values before clinical symptoms of tumor recurrence. In the patient group with local recurrence, only 11 (23.9 per cent) of 46 patients had previously pathologically raised CEA values. Of 31 patients, 15 (48.4 per cent) underwent curative resection after the second-look operation. At this time, 12 patients (38.7 per cent) still had normal CEA values, whereas only three patients (9.7 per cent) had pathologically raised CEA values. From these results, it was established that early diagnosis of tumor recurrence was very low. Therefore, one should not rely more on postoperative routine CEA determinations in the postoperative monitoring of patients following curative operations for colorectal carcinoma than on regular comprehensive follow-up examinations of these patients. [Key words: CEA determinations; Recurrent colorectal cancer; Second-look surgery; Secondary abdominoperineal resection]

The value of routine serial CEA determinations in the early diagnosis of local recurrence after operations to cure colorectal carcinoma is still disputed today. Some American work groups believe that approximately one of five patients is operable through a second-look intervention following premature increase in CEA values in the pathologic area, but only one of ten is operable if one waits for the development of relevant clinical symptoms of tumor recurrence. Nevertheless, there are presently only a few clinicians who are prepared to accept the indication for second-look intervention based entirely upon pathologically raised CEA values. In the past five years, we have routinely carried out serial CEA determinations on our patients following operations for colorectal carcinoma. In 86 patients, we have observed recurrence of the tumor. In 31 patients, a second-look operation was carried out. The following report discusses the results of our CEA determinations and their reliability in the early diagnosis of tumor recurrence.

Materials and Methods

In the past five years, 235 patients have reported to our Oncology Outpatients Department at eight- and 12-week intervals for follow-up examinations following operations for colorectal carcinoma. In addition to a thorough physical examination, proctoscopy or colonoscopy and serum biochemistry analysis were carried out depending upon the operation performed. In conjunction with the Düsseldorf University Institute for Hygiene, CEA values were determined by using the Abbott-CEA-EIA-test (solid phase enzyme-immunoassay) on which the "sandwich" principle is based. The normal value for CEA was fixed at 5 ng/ml by a serial study on 5000 clinically healthy 40 to 65-year olds carried out in rural and industrial regions of West Germany.

X-rays were taken, and nuclear medicine or computed tomographic studies were carried out at yearly intervals. Relevant investigations were also carried out in all patients who had pathologic CEA values and who had suspected recurrence of a tumor.

In 86 patients, a tumor was established after surgery by various diagnostic procedures (x-ray, computed tomography, scintigraphy, procto-
colonoscopy, aspiration, and others). In all 86 patients, the time when the tumor recurred was related to the corresponding CEA serum level in order to obtain data on the value of CEA determinations and early diagnosis of tumor recurrence.

In 31 patients, a second-look operation was carried out. Serial CEA determinations were also performed on these patients. Pathologic increases in CEA values and clinical evidence of recurrence of a tumor were analyzed in more detail with reference to time correlation.

Results

Fifteen of our 86 patients had pathologic CEA values (17.4 per cent) even before clinical evidence of tumor recurrence. The majority of patients (48 = 55.8 per cent) had pathologic CEA values when there was already evidence of tumor recurrence. The figure of 23 patients with clinically diagnosed tumor recurrence without pathologic CEA values was also high.

We further distinguished the patients with tumor recurrence—those patients with local recurrence and those with metastases distant from the primary tumor. Of the 46 patients with local recurrence who represented the most important group for a second-look operation, only 11 (23.9 per cent) had pathologic CEA values before clinical manifestation of local recurrence. On the other hand, in 18 of 46 patients (39.1 per cent), the local recurrence was established by clinical diagnostic means alone, and the CEA values were still within normal range at this time.

Of the 40 patients with metastases distant from the primary tumor, four (10 per cent) had pathologic CEA values as an early symptom of recurrence of the tumor. In a further five of 40 patients (12.5 per cent), tumor recurrence with normal CEA values was diagnosed by means of clinical procedures.

However, the majority of patients had raised pathologic CEA values only at the time of clinical symptoms of tumor recurrence, i.e., 31 patients (77.5 per cent).

A second-look operation was performed in 31 (36 per cent) of 86 patients with tumor recurrence. At the time of this second operation, 18 patients (58 per cent) had normal CEA values despite the diagnosed tumor recurrence, and only 13 patients (42 per cent) had pathologic CEA values.

At the time of the first curative operation, all 18 patients had pathologic CEA values, but of the 13 patients, ten had pathologic, and 3 were normal.

Table 1 gives the individual surgical procedures that were still possible in these 31 patients in view of tumor recurrence following the second-look operation. The CEA serum value recorded at the time of the individual surgical interventions is also given in this Table. A curative resection was thus carried out in 15 patients following the second-look operations. Twelve patients (38.7 per cent) still had normal CEA values at this time, and only three patients (9.7 per cent) had pathologic CEA values.

Comments

In agreement with other authors, our results show that routine CEA determinations following curative operations for colorectal carcinoma are of little value in the early diagnosis of tumor recurrence. This applies mainly to patients with local recurrence in whom conditions for a second-look operation are very favorable. Of our 46 patients with local recurrence, 18 (39.1 per cent) still had normal CEA values at the time of clinical diagnosis. Only 11 patients (23.9 per cent) had pathologic CEA values as an early symptom before local recurrence.

American study groups contend that the percentage of patients still operable following a second-look operation decreases by 50 per cent if one waits for clinical evidence of tumor recurrence despite the presence of pathologic CEA values. Our results contradict this view. At the time of the second-look operation where clinical symptoms of tumor recurrence were already present, 18 of 31 patients (58 per cent) still had normal CEA values. Twelve patients (38.7

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<td>Exploratory laparotomy</td>
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<tr>
<td></td>
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Table 1. Type of Second-look Operation as well as CEA Serum Levels in 31 Patients with Recurrence Following Curative Operation for Colorectal Carcinoma