

Society. The positive CEA were obtained in 19% (3/16) of stage I, 30% (7/23) of stage II, 37% (10/27) of stage III, 74% (31/42) of stage IV and 50% (4/8) in recurrent cases. CEA levels over 20 ng/ml was observed in 15% of stage III and 48% of stage IV.

CEA level was also observed in terms of histological type. The positive CEA were obtained in 34% (19/56) of squamous carcinoma, 75% (31/40)

of adenocarcinoma, 24% (4/17) of small cell carcinoma, 33% (1/3) of large cell carcinoma.

The intermittent measurement of plasma CEA level was available to estimate the effect of treatment and prognosis in lung cancer. In lung cancer patients, high CEA levels were decreased to below 2.5 ng/ml after curative operation, and rising of CEA levels were seen in most of patients with relapse or progress.

### **Clinical Significance of Carcinoembryonic Antigen in the Liver Diseases**

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Studies on the Radioimmunoassay of Carcinoembryonic antigen (CEA) using CEA-RIA kit were performed in 205 cases. Of 205 cases, 54 had benign diseases, 111 had malignant diseases and remaining 40 had normal subjects.

1) It was considered that normal range of serum levels were 0–2.5 ng/ml.

2) 30 out of the 40 (75%) patients with hepatic metastasis had CEA levels greater than 5 ng/ml, on the other hand 6 out of the 26 (23,1%) patients with non hepatic metastasis.

A CEA level greater than 5 ng/ml thus indicates the presence of metastatic lesion in the liver.

3) Detection of CEA and AFP could help differentiate primary and metastatic liver cancer.

4) In metastatic liver cancer, 27 out of the 35 (71%) showed CEA levels greater than 5 ng/ml, 25 out of the 35 (77%) showed clear-cut of focal defect on liver scintigram. Over-all diagnostic accuracy for detection of metastatic liver cancer which showed either well defined focal defect on liver scintigram or positive CEA was 91.4%.

5) Serial CEA determinations during chemotherapy and after operation may be useful monitoring cancer patients.

### **Evaluation of C. E. A. Values in Urine on Diseases of Urinary Tracts**

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Usefulness of urinary CEA level measurement as a screening test for detection of tumor recurrence in cases with postoperative status for urinary disorders was evaluated.

**MATERIALS AND METHODS** (1) Two hundred six cases with various urinary disorders with or without surgery were studied. Urinary CEA levels were measured by radioimmuno-assay of one step sandwich method. CEA levels above

2.5 ng/ml were considered positive. Frequency of positive CEA and urinary CEA levels among each disorder were evaluated.

(2) Experimental studies: Tissue CEA levels of resected large and small intestines using mice (d.d.N. Strain) were measured by two step radioimmuno assay methods.

**RESULTS** (1) Most post-operative cases showed highly abnormal urinary CEA levels.

Positive ratios in each surgical procedure were as follows: 96% in colcystoplasty cases, 97% in ileal conduit cases, 100% in ureteroplasty cases using the ileum and 93% in nephro or ureterostomy cases. The CEA levels were not affected by the presence of concomitant urinary tract infection. There is a tendency that the urinary CEA levels in cases with reconstruction using the ileum are slightly higher than those of cases with colo-cystoplasty.

(2) Experimentally, there is no significant difference in tissue CEA levels of the small bowel and

large bowel in mice.

**SUMMARY** Urinary CEA in patient with bladder reconstruction after cystectomy is of no value as a screening test for malignancy recurrence. The difference of urinary CEA levels between colcystoplasty and ileal conduit or ileal ureter is probably not due to difference in location of the bowels, but possibly due to difference in surface areas of the mucosa between the resected small bowel and large bowel, for the small bowel contains much larger mucosal surface.

### **Evaluation of Urinary CEA in Patients with Urologic Cancer and Histological Localization of CEA in Urologic Cancer**

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Urinary CEA was examined on 45 patients with urologic cancer, 13 cases with urinary tract infection and 17 normal controls using "one step sandwich method". These results are compared with serum CEA.

Urinary CEA levels elevated in the patients with renal pelvic, ureteral and bladder tumors which were in direct contact with urine.

Also in the patients with urinary tract infection, urinary CEA levels showed remarkably high values.

Mean value of urinary CEA was  $1.40 \pm 0.77$  ng/ml in the normal subjects, but  $4.41 \pm 4.42$  ng/ml in patients with urinary tract infection.

Mean value of urinary CEA of the bladder tumor without urinary tract infection was  $3.79 \pm 2.91$  ng/ml, while the value of the bladder tumor with urinary tract infection was  $8.20 \pm 4.75$  ng/ml.

CEA values of bladder tumor with and without infection showed significant difference.

The correlation between the urinary CEA level

and serum CEA level showed to be significant ( $r=0.6$ ) in cases with urinary tract infection, but not significant in cases without urinary tract infection.

Histological localization of CEA in urologic cancer was investigated by sandwich tests of immunofluorescence technique using FITC labelled IgG.

Histological localization of CEA in urologic cancer was investigated by sandwich tests of immunofluorescence technique using FITC labelled IgG.

Fluorescent cells appeared clearly in transitional cell tumors of the urinary bladder and ureter, and mildly in testicle embryonal carcinoma. But renal cell carcinoma did not show positive fluorescence.

Grade of positive fluorescence in the cell of urologic cancer was less than those of gastrointestinal cancers.