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研究速報

## Immunohistochemical Study of Fibronectin Expression in Cancer Tissue Exposed to Irradiation

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### 癌組織中のフィブロネクチンの免疫組織化学的検討 —放射線治療中の変化と治療効果—

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癌の放射線治療におけるフィブロネクチンの変化と治療効果との関係を検討するために、放射線治療前および10Gyあるいは30Gy照射後の癌組織中のフィブロネクチンを免疫組織化学的に染色し評価した。対象は、頭頸部領域癌3例であり、染色には、ヒトフィブロネクチンに対するモノクローナル抗体と、アビジン-ビオチン-ペルオキシダーゼ法を用いた。結果、放射線照射前後におけるフィブロネクチンの発現度および発現様式に

は、明らかな変化はみられなかった。しかし、予後に関しては、フィブロネクチンが癌組織を厚く取り囲んでいた1例においては良好であったが、癌組織中に瀰漫性に発現していた1例および発現がほとんど認められなかった1例においては不良であったことから、癌組織中のフィブロネクチンの発現度、発現様式と予後の間に密接な関係のあることが示唆された。

### Introduction

Fibronectin is a high molecular weight glycoprotein intimately related with local invasion and distant metastasis<sup>1)2)</sup>. In order to understand the biological characteristics, such as metastatic or invasive potential of each type of cancer, and to analyze the effect of radiation therapy on cancer, we studied fibronectin in cancer tissue before and after irradiation using the immunohistochemical method.

### Materials and Methods

Three patients with cancer of the tongue and nasal cavity were examined (Table 1-a). Fibronectin in cancer tissue was analyzed by the avidin-biotin-horseradish peroxidase method (ABC method) using a monoclonal antibody against human fibronectin in tissues taken just before therapy, after approximately 10 Gy and after 30 Gy of irradiation. The procedure was described in detail elsewhere (reference No. 3). The

Table 1-a Summarized data of patients studied

Case	Sex	Age	Site	TNM stage ①	Histology	Radiation/Surgery
1	M	40	Tongue	T2N0M0 II	Wd-SCC	30Gy+Op.
2	M	61	Nasal cavity	T3N0M0 III*	Pd-SCC	30Gy+Op.
3	M	50	Tongue	T2N1M0 III	Wd-SCC	30Gy+Op.

Wd-SCC: Well differentiated squamous cell carcinoma

Pd-SCC: Poorly differentiated squamous cell carcinoma

Op. : Operation

① : UICC classification (1987)

\* : refer to UICC classification of maxillary cancer

Table 1-b Expression grade and distribution pattern in each irradiation dose

Case	before irradi.	10Gy irradi.	30Gy irradi.
1	E/++	E/++	
2	D/++	D/++	D/+
3	/-	/-	

distribution pattern<sup>1)</sup>/expression grade<sup>2)</sup>

1) E : encircle D : diffuse

2) - : absent + : slight ++ : moderate +++ : marked

Table 1-c Antitumor effect and prognosis

Case	Antitumor effect of irradiation ②	Prognosis
1	III	good (alive: 3 years without recurrence)
2	III	fair (alive: 3 years with local recurrence)
3	IIa	poor (dead: 10 months)

② Ohboshi and Shimosato's Classification for the effect of radiotherapy

grade of expression and the distribution pattern of fibronectin were evaluated, and the relationship between these results and the patient's prognosis was examined. The antitumor effect after 30 Gy of irradiation was evaluated according to Ohboshi and Shimosato's Classification for the effect of radiotherapy<sup>4)</sup>.

### Results (Table 1-b, 1-c)

No remarkable changes in the expression grade or in the distribution pattern of fibronectin were found between tissue specimens taken before and after each dose of irradiation. The prognosis, however, was different for each of the three cases. The patient in which the cancer tissue was encircled thickly by fibronectin is alive without recurrence for three years; another in which the fibronectin expression was diffuse is alive with local recurrence; and one with only faint expression of fibronectin died after 10 months.

### Discussion

In recent years, the biochemical study of the extracellular matrix has led to a significant increase in our knowledge of its components. Among them, fibronectin is the most representative example, and it is now well known that it plays important roles in many physiological activities<sup>5)</sup>, especially in invasion or metastasis of cancer. Therefore, to evaluate the effect of radiation therapy on cancer, it is important to examine fibronectin in cancer tissue before and after irradiation. From the present results, it was concluded that the expression grade and the distribution pattern of fibronectin in cancer tissue are not

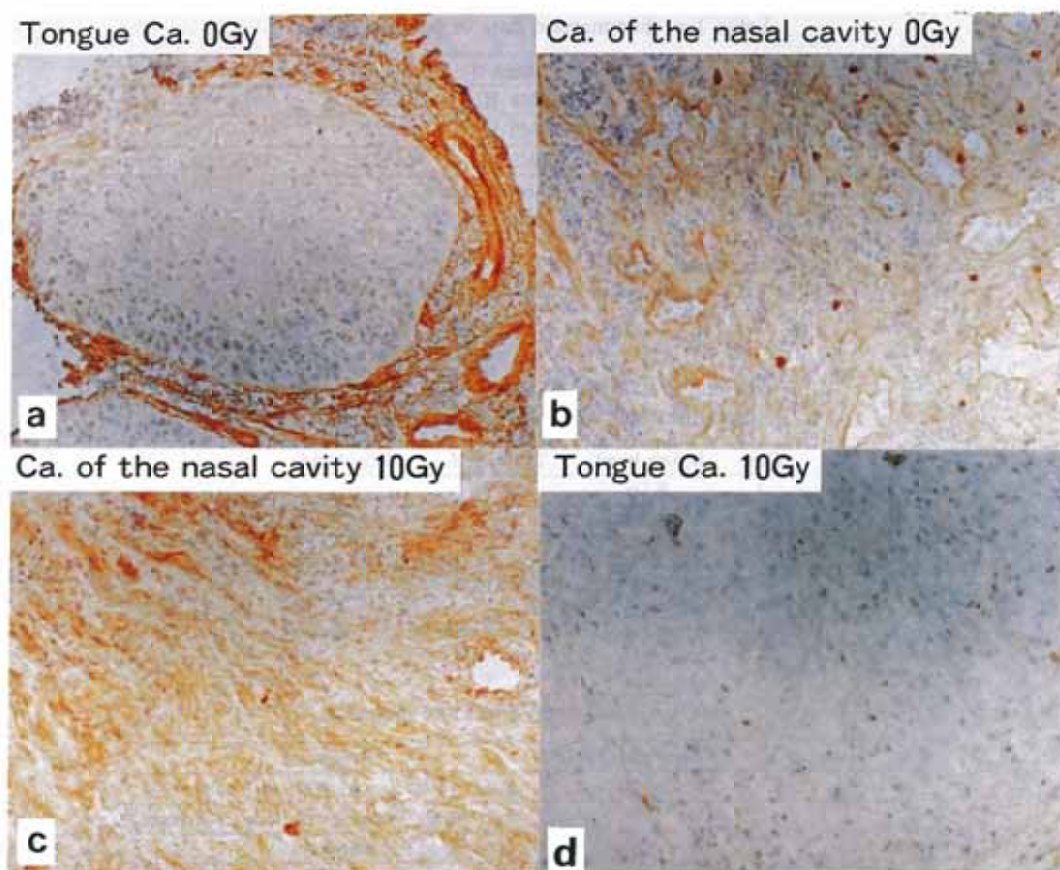


Fig. 1 Immunohistochemical staining of cancer tissue

- a. Case 1 before irradiation. Cancer tissue was encircled by fibronectin.  $\times 200$ .
- b. Case 2 before irradiation. Fibronectin was diffusely distributed in cancer tissue.  $\times 200$ .
- c. Case 2 at one day after 10 Gy. The same findings as before irradiation were seen.  $\times 200$ .
- d. Case 3 at one day after 10 Gy. Fibronectin was faintly expressed in cancer tissue.  $\times 200$ .

affected by small doses of irradiation but seem to keep an intimate relationship with the patient's prognosis.

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