RADIATION TREATMENT OF CARCINOMA OF THE THYROID

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INTRODUCTION

Radiation treatment of thyroid carcinoma has not been regarded as of great importance because of its low radiosensitivity. Recently, however medical use of isotope has made great progress in the therapy and diagnosis of thyroid tumor, and we have taken this opportunity to reinvestigate our results of radiation treatment. In this report, we analysed 97 cases of thyroid carcinoma previously treated by radiation during 1946-1955.

Grading of Clinical Stage and its Survival Rate.

We classified our cases by Jacobsson's grading of clinical stage (1954), and found that each group representing one of the following four grades, divided in 4 groups shows its own characteristic survival curve, as indicated in Figure 1:

Grade I: Primary tumor is mobile and has no metastasis.

Grade II: Primary tumor is mobile or slightly fixed and only one mobile metastasis is present.

Grade III: Primary tumor enlarged and invaded the surrounding tissue and heavily fixed. Many fixed metastases are present.

Grade IV: With remote metastases.

Radiosensitivity

Many authors have described the low radiosensitivity of thyroid carcinoma. We also have experiences that many thyroid tumors show slight diminution in their sizes long time after the irradiation or show no change at all.

In our cytological experimental work, we compared radiosensitivity of thyroid carcinoma with breast carcinoma, by counting numbers of viable tumor cells in certain microscopic area, after X-ray irradiation under the same conditions. Changes in number of viable cells in the two kinds of cancer according to time after irradiation are shown in Figure 2, which indicates that the radiosensitivity of thyroid cancer is much lower than that of breast cancer, in spite of the fact that they are both adenocarcinoma and have the same kind of histological picture.
Histological Classification

We classified 49 cases of thyroid carcinoma in which their histological pictures are clear, by S. Warren and W.A. Meissner’s classification. They are shown in the following table (Table 1). From this table, it is clearly recognized that squamous cell carcinoma, anaplastic carcinoma and spindle cell carcinoma have worse prognosis than adenocarcinoma in spite of their relatively high radiosensitivity.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td>Adenocarcinom</td>
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<tr>
<td>Papillary type</td>
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<tr>
<td>Cystipapillary type</td>
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<tr>
<td>Follicular type</td>
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<tr>
<td>Squamous cell carcinoma</td>
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<tr>
<td>Anaplastic carcinoma</td>
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<td>Spindle cell tumor</td>
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<td>total</td>
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Treatment Method

For the cases of adenocarcinoma we apply, 1) Operation added by external radium application (2500-3800 r) or teleradium irradiation. 2) External irradiation by X-ray, Co 60 or radium (4000-4500 r) added by gold Rn-seed implantation, and / or 3) Radium needling.

To the cases of squamous cell carcinoma or anaplastic carcinoma or spindle cell tumor, we practice radium needling or Rn-seed implantation added by external radium application.

We have treated thyroid carcinoma usually by the above mentioned plan. External use of radiation alone does not usually show sufficient effect for thyroid carcinoma except in the cases of early stage, because of the low radiosensitivity. Therefore, we irradiated it by X-ray, Co 60 or teleradium (4000-5000r), and after that added Rn-seed implantation.

As for radium needling, its end results are often unfavourable, for instance, it has the danger to induce distant metastasis. So we rather prefer Rn-seed implantation to radium needling from the viewpoint of safety.

Result and Discussion

The relationship of survival rate in both cases treated by radiation alone or
treated by operation with radiation are shown in Figure 3. Although the survival rate is 100% for the cases in early stage treated by operation with radiation, as a whole, including both II and III grades, the curve of survival rate in the cases treated by operation with radiation shows the descending tendency. So we cannot find the distinct difference, on the whole, between these two kinds of treatment described above. From our results, it seems better to use only radiation for the cases of II or III grades. The survival rates of all cases which we have treated are shown in Figure 4.

Radiosensitivity of the thyroid tumors differs greatly according to their histology. Therefore it is very important to take biopsy before the treatment, in order to decide whether the case should be treated by radiation alone or by operation. The prognosis will be greatly influenced by the treatment.

**SUMMARY**

We analysed 97 cases of thyroid carcinoma which were treated by radiation during 1946–1955 and tried to reinvestigate it on the standpoint of the following facts:

A) There exists a close relationship between histological figure of tumor and its prognosis, and we must use different treatments for different types of tumor. It is imperative that we take biopsy before the treatment, in order to determine the most suitable form of treatment.

B) The tumor which has higher radiosensitivity is rather worse in its prognosis than the one with lower sensitivity.

C) Although the cases in the first stage are fit for the treatment by operation with radiation, we would rather use the treatment by radiation alone for the cases in II or III stages.
REFERENCES

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要 旨

甲状腺癌の放射線治療

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われわれは 1946 年より 1955 年までの間に治療した 97 例の甲状腺癌症例を，主として放射線治療の見地から分析考察して次の結果を得た。

1. 5 年生存率は 16%であった。
2. 放射線感受性の高い腫瘍は，その低いものより予後が悪い。
3. 臨床進度 I 度のものに対しては，手術に放射線照射を併用して 100％の治癒率を得ているが，II，III度の症例においては放射線だけを用いて治療したものと，手術との併用治療したものとの治療成績に明らかな差異を認めないのので，現在われわれは II，III度の症例には放射線のみによる治療を行っている。
4. 治療を始める前に組織学的性状を確かめることは，診断の確認，放射線感受性の推測，予後推定上特に重要である。