

## Chronological Changes of the Res-O-Mat $T_3$ , $T_4$ Value after Treatment to the Patients with Hyperthyroidism

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$^{131}\text{I}$ -TUR, Res-O-Mat  $T_3$  and  $T_4$  tests have been used in Dept. of Radiology, Morioka Red Cross Hospital to evaluate the efficacy of treatment to the patients with hyperthyroidism since 1970.

Our way of treatment has been either surgical or medical. As a medical treatment,  $^{131}\text{I}$  and antithyroid drugs have been administered.

- 1) Among the 7 cases of surgical treatment,  $^{131}\text{I}$ -TUR test showed normal uptake in 4 cases one month after the treatment. In 3 cases, the uptake still remained abnormally increased. In  $T_3$  and  $T_4$  tests, 5 cases were found to be normal. 1 case showed increased uptake and a decreased uptake was noted in 1 case.
- 2) Among the 8 cases of  $^{131}\text{I}$  treatment, 5 cases

showed normal uptake after 2 months. Persistent high uptake was found in 3 cases. In  $T_3$  test, the uptake usually returned to normal level one week after the  $^{131}\text{I}$  medication, whereas 2 weeks were necessary for the uptake to return to normal level in  $T_4$  test, although the uptake always fluctuated after this period of 2 weeks.

- 3) Few cases showed normal level in  $^{131}\text{I}$ -TUR test one year after the antithyroid drug medication. In  $T_3$  and  $T_4$ , normal level was attained usually after one month.

**Conclusion:** As Res-O-Mat  $T_3$  and  $T_4$  tests are not affected by the presence of serum iodine, and they can be repeated without side effect, they are useful to evaluate the efficacy of treatments periodically.

## Incidence of Hypothyroidism after $^{131}\text{I}$ Treatment of Hyperthyroidism

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To estimate the incidence of hypothyroidism after  $^{131}\text{I}$  treatment of hyperthyroidism in Japan, the results of 1119 patients at 5 clinics were ana-

lysed, where those patients were treated with a dose of  $^{131}\text{I}$  individually estimating the radiation absorbed dose of thyroid gland.

The treatment factors of those patients were similar with those averagely used in Japan. The mean initial dose of  $^{131}\text{I}$  in the present series was 5.6 mCi and 6340 rads to thyroid.

The thyroidal function of those patients was evaluated in 1969 and 1972.

The incidence of hypothyroidism was calculated by the following methods.

- (1) The number of the hypothyroid patients was divided by the total number of the evaluated patients every year of the (initial) treatment.
- (2) The cumulative incidence year by year after the (initial) treatment was calculated by life table method.

The incidence of hypothyroidism calculated by the method (1) in 1972 was on the average about 6.7% higher than that in 1969.

The incidence calculated by the method (2) reached 26% 12 years after the (initial) treatment

and with the yearly increment of 2.3%. This rising incidence was practically identical between calculations based on the evaluation of the patients in 1969 and 1972.

The close correlation was found between the incidence of hypothyroidism 5 years after the treatment and the initial dose of  $^{131}\text{I}$  in rads among the reported series of western countries and Japan. This seemed to suggest the lower incidence of hypothyroidism mainly due to the policy of the lower initial dose averagely used in Japan.

Radiation absorbed doses to thyroid of the individual patient who became hypothyroid after one dose were distributed in a wide range from 2200 rads to 15700 rads, though the higher incidence was observed in the group of patients who received higher radiation absorbed dose to thyroid.

### Effect of Radioiodine Therapy of Thyroid Carcinoma

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In cases of carcinoma of the thyroid in which radical operation is impossible, radioiodine therapy has been attempted. In the indication for radioiodine therapy and evaluation of therapeutic value, however, no definite criteria are yet available. From such a viewpoint, clinical and pathohistological studies were conducted in 3 cases of carcinoma of the thyroid and treated with radioiodine. The following results were obtained.

- 1) The follicular structure of the cancer tissue represents one indication for radioiodine treatment. Even in well differentiated types, not much effect is expected in those without follicular structure. However, the histologic picture may be different between the primary

lesion and metastatic lesions, and this needs special attention.

- 2) In order to obtain optimal therapeutic effect with radioiodine, normal thyroid tissue should be resected before radioiodine therapy. Surgical total thyroidectomy is more effective than  $^{131}\text{I}$  ablation.
- 3) For evaluation of the therapeutic effect, along with the clinical course, histological findings are most important. In cases with a positive effect, flattening of the nuclei and cytoplasm of cells constituting the follicle, degeneration of the follicle, proliferation of granulation tissue, and fibrous change are noted.