

**RADIOLOGICAL SIGNIFICANCE OF THE THYROID  
GLAND CALCIFICATIONS**

Us J., M. Auersperg, R. Golouh

**Abstract:** In order to differentiate benign from malignant lesions of the thyroid gland, neck soft tissue roentgenography was performed in 45 patients. In 25 patients calcifications in neck soft tissues were found. Out of 25 cases, 16 were correctly interpreted as benign and 5 as malignant whereas two false positive and two false negative interpretations were made. In the group of 20 patients without roentgenologically demonstrable calcifications, 16 had histologically benign lesions, 2 had papillary and 2 follicular carcinoma of the thyroid gland. Since in 21 out of 25 cases the calcifications were correctly interpreted the use of the described method seems to be justified. In view of the 8 incorrectly interpreted cases the method, however, should be employed only in combination with other diagnostic procedures.

UDK 616.44-003.84-073.75(497.1)

**Deskriptori:** Rentgenska diagnostika, ščitnica, kalcinacije, diagnostični pomen.

**Radiol. Jugosl.,** 4; 315—318, 1974

**Introduction.** — Cancer of the thyroid gland is relatively rare accounting for no more than 0.1 to 0.7 percent of all malignomas. It is more frequent in women than in men. Its highest incidence is between age 40 and 70 but it can be observed also in childhood (1,7).

The relatively favorable prognosis and the successful treatment of early cases call for an accurate diagnostic evaluation of each single case.

**X-ray method.** — Among the various roentgenological diagnostic procedures for the assessment of thyroid pathology there is besides the technically more demanding methods (angiography, pneumothyreography, etc.), also the simpler neck soft tissue roentgenography, the diagnostic value of which is comparable to that of the former ones (2). The advantage of the neck soft tissue roentgenography is in that no special equipment is required. The method

is simple and similar to soft tissue roentgenography used for joints, the larynx, the breast, etc. (3).

In goiter calcifications are frequently encountered. From the shape of these calcifications the nature of thyroid gland changes can be determined (3, 4, 5).

In benign lesions calcifications develop at a slow rate. Their contours are sharply delineated, their shape is regular or irregular (conchiform, oblong, spherical, polygonal) their diameter is from a few millimeters to several centimeters. On roentgenograms their shadow is dense and sharply outlined (Fig. 1).

In malignomas the calcifications develop at a fast rate, are small, amorphous, their contours are blurred, their shape is irregular, their density is weak and they are poorly visible on roentgenograms (Fig. 2).

The malignant and benign type of calcifications occur often concomitantly.



Fig. 1. Benign calcifications in the neck soft tissue

In neck soft tissue roentgenography different techniques are utilized. Some workers use cassettes (4) others again fine grained films without intensifying screens, i. e. films as used in mammography (5).

**Methods and materials.** — From September 1972 to November 1973 a modified neck soft tissue roentgenography was used for patients with various thyroid gland diseases with aim to differentiate malignant from benign lesions.

The postero-anterior and lateral views were taken. The cassettes with fine grained intensifying screens and commercial films were used. A group of 62 patients, 44 females and 18 males were examined. Calcifications were detected in 32 patients whereas in the remaining 30 patients none could be demonstrated. In the following only those 45 patients will be discussed who had been operated and whose roentgenological findings were correlated with definite histology.

**Results.** — In 25 of these patients calcifications were revealed by neck soft

tissue roentgenography. The calcifications were classified as benign or malignant and correlated with the histological findings (Table 1).

In 20 patients in whom our method failed to reveal calcifications, histological examination showed benign lesions in 16 and carcinoma in 4 cases.

In 45 patients who had undergone surgery, histological examination revealed malignomas in 11, roentgenological examination only in 5 cases. In 6 patients with malignoma the diagnosis was false negative whereas in 4 cases of malignoma no calcifications were revealed.

Calcifications were most frequently detected in benign lesions of the thyroid gland. Sixteen of them were correctly interpreted. In two cases only, the roentgenological diagnosis of the lesions was false positive.

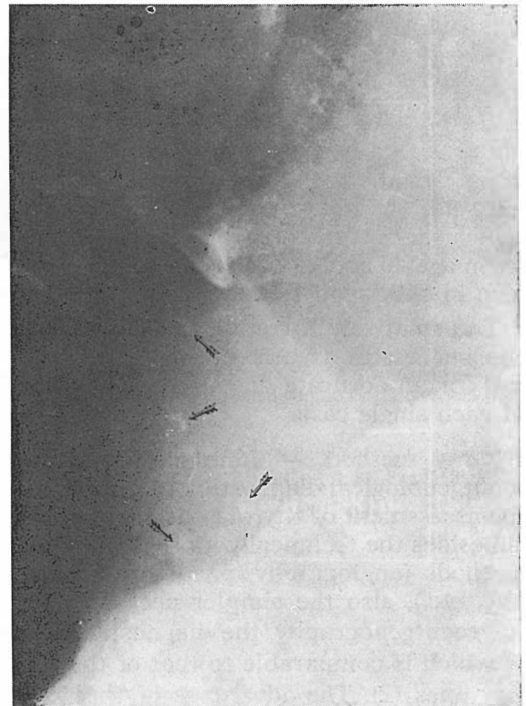


Fig. 2. Malignant calcifications in the neck soft tissue

Table 1

No of cases	Age	Sex	Roentgenological findings	Histological findings
1	59	M	Benign	Anaplastic carcinoma
1	68	M	Malignant	Follicular carcinoma
1	69	M	Malignant	Follicular carcinoma
1	67	F	Malignant	Follicular carcinoma
1	60	F	Malignant	Follicular carcinoma
1	69	F	Malignant	Follicular carcinoma
1	65	M	Benign	Follicular carcinoma
1	34	F	Malignant	Nodular goiter
1	65	M	Malignant	Nodular goiter
16	22—71	13 F 3 M	Benign	Various benign lesions
Total 25 cases				

Our cases of thyroid gland carcinoma were histologically classified as follows:

Follicular carcinoma	8 cases
Papillary carcinoma	2 cases
Anaplastic carcinoma	1 case

It is interesting to note, that in our two cases of papillary carcinoma no psammoma bodies, which according to Segal (5) are typical for this kind of carcinoma were found neither roentgenologically nor histologically.

**Povzetek.** — Avtorji prikazujejo 45 primerov, kjer so s pomočjo nativnega rentgenskega posnetka mehkih delov vratu skušali ločiti maligne od benignih sprememb v ščitnici. Ugotovitve so preverjali operativno in histološko.

Pri 25 bolnikih so ugotovili kalcinacije v mehkih delih vratu ter pravilno ovrednotili naravo obolenja pri 16 benignih spremembah in pri 5 malignomih.

Pri dveh malignomih je bila rentgenološka ugotovitev napačno negativna, pri dveh benignih spremembah pa napačno pozitivna.

Pri 20 bolnikih z opisano rentgensko preiskovalno tehniko ni bilo mogoče ugotoviti kalcinacij v mehkih delih vratu. Pri 16 bolnikih te skupine so histološko ugotovili nemaligno naravo obolenja, pri štirih pa malignom.

#### References

1. Blohin N. N. et al.: Kliničeskaja onkologija, I, 359—375, Medicina, Moskva 1971.
2. Kučinskij G. A.: Inst. exp. clin. oncol. AMS USSR, Roent. dep. Moskva. Personal communication.

3. Schiz H. R. et al.: Lehrbuch der Roentgendiagnostik, I., 214—216, Georg-Thieme Verlag, Stuttgart, 1965.

4. Segal R. L. et al.: Soft tissue roentgenography. Its use in diagnosis of thyroid carcinoma, J. A. M. A., 173, 27; 70—74, Avg. 1960.

5. Fournier M. et al.: Considerations sur les calcifications thyroïdiennes, J. Radiol. Electrol., 43, 502—504, 1962.

6. Person K. D. et al.: Familial medullary carcinoma of the thyroid, adrenal pheochromocytoma and parathyroid hyperplasia. Radiology, 107, 2, 249—256, 1973.

7. Rak v Sloveniji (Cancer in Slovenia), 8—12, 1966—1970.

Address of the author: Dr. Us Jurij, The Institute of Oncology, Vrazov trg 4, 61105 Ljubljana, Yugoslavia.

---

\* This work was supported by the »B. Kirič« Foundation.