THE DIAGNOTSIC VALUE OF THYROLYMPHOGRAPHY IN THYROID DISEASES

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INTRODUCTION

Clinical evaluation biochemical analyses and thyroid scanning are known to be principal diagnostic tools in experience of thyroid diseases. Among these physical examination is the first method to be performed, but it is often insufficient to reach the exact diagnosis. On the other hand in biochemical anaylses and thyroid scaning, the results are generally associated with the function of the gland 1,12. Thus, the new diagnostic methods have been investigated for assessing the thyroid gland and so for this purpose the diagnostic methods, such as xeroradiography, CT, termography, needle aspiration biopsy and thyrolymphography have been used. These methods provide wortier knowledge with a different approch, since they show the thyroid without depending on its function. Since, clinical examination is insufficient to define the quantity and quality of the lesion, one should keep in mind that the solitary nodule detected by clinical examination may be a part of multuinodular goitre or an adenoma, a cystic nodule or a malingnant nodule 16,19.

Thyrolymphography which has recently been begun to be employed in the diagnosis of the thyroid diseases could be easily performed with a portable roentgen aparatus. Beside it is low cost and easily application, due to the morphologic image it provides detailer knowledge than the other methods. Thus thyrolymphography gives the possibility to advance in diagnosis and treatment. In this study, we aimed to find out how a relatively new radiological diagnostic method, thyrolymphography could be successful and provide helpful results in the diagnosis of the thyroid diseases.

Thyrolymphography is a new radiologic diagnostic method, for the purpose of showing the thyroid and surrounding lymphnodes which thyroid drains

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into , it is performed by giving "lipiodol ultrafluid., to thyroid tissue percutaneusyl, in order to be able to visualized the thyroid, parathyroid and varies pathology of the neck.

INDICATIONS

Thyrolyphography is indicated in 1) determining whether or not the sotitary nodule is present and its relation to malignancy, 2) determining nodule number, 3) determining the spreading of the thyroid cancers, 4) showing the retrosternal goitre and 5) planning the surgical treatment of head-neck tumors and determining hyperfunction of the thyroid and parathyroid glands.

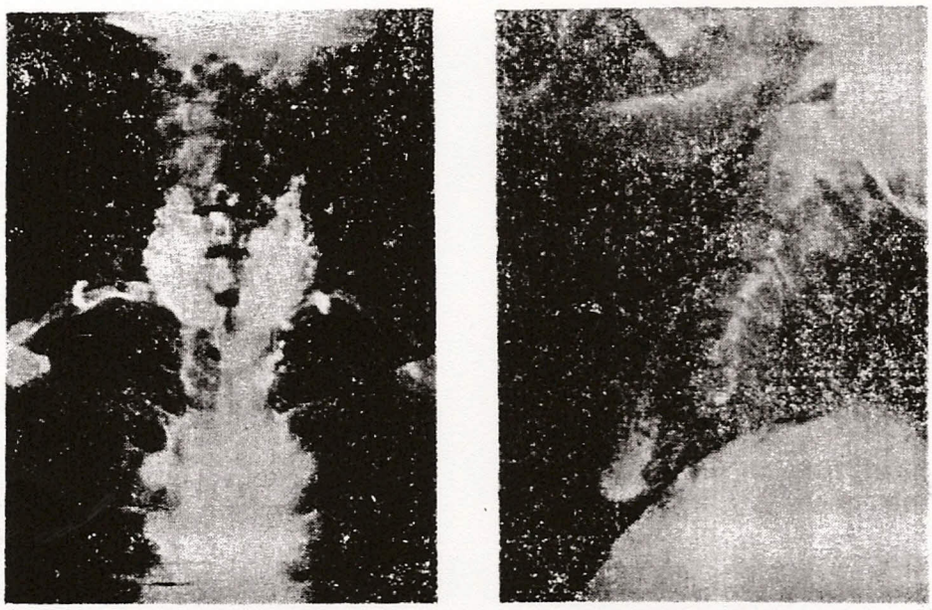
EVALUATION

a. Evaluation of the thyroid gland: Thyroid gland having a rich lymphatic structure gives a regular reticular appearance (fig. 1,2). In thyroid pathologies, the following lymphographic patterns were recognized. (1) In hyperthyroidism: The contrast medium rapidly distrubutes to interglandular lymphatics and reaches to peripheral lymphatic nodes within 15 minutes, and 60-90 % of contrast medium leaves the thyroid within 48 hours 24, 2) In nodular goitre: The nodules in paranchyma are seen in filling as one or more numbers, their sizes

Figur 1.58 years old woman, there is normal thyrolymphography on the 15th minute radiograms. These show reticular view from anteroposterior and lateral projections.

are ranged 0. 5 to 4 cm. and their shape could be oval, circled and regular 14,19. Adenomas, adenomatous dejeneration, cysts, and colloidal goitre give nodular appearances, 3) In hypothyroidism: The distrubution of the contrast medium is show and thyroid gland is small, 4) In thyroiditis: There is a diffuclty in injection and no structural çhanges, 4) In the carcinoma: Regular reticular pattern is impaired ard „pachy wool appearance" is seen 10,19. Thyroid shows an irregular growth.

b. Evaluation of the cervical lymph nodes: The hilum of the lymph node has a regular appearance, but its paranchyma indicates granular appearance. lymph nodes generally begin to fill one hour after injection of contrast medium, and 24 hours later filling became complete (Fig. 2). In malignant tumors, marginal defects that are in the maner of ',moth-eaten" are found. The mediastinal lymph nodes can be shown in 4 to 20 % 8,21,23.



Figur 2,The same patient's 24 th hour radiograms after contrast injection, cervical lymph nodes and thyroid lobes are seen, deep jugular nodes have been noteced on the lateral radiogram.

The complications of the thyrolymphography:

The method should not be applied to the patients having a sensitivity to to iodine. The infection may develope if one does not care of sterilization. The fatty embolism may develope if contrast medium is infected into vascular structures. The foreign body reaction developes against contrast medium.

MATERIAL AND METHODS

In present study, between September 1978 and october 1982, 64 patients were reveiwed, in these patients patholoogic thyroid was thought to be present and whom previously ultrasonography, then later thyrolympnography were performed. Of the patients 37 were female and 28 were male. The method was performed as described by Mathoba-Kikuchi 14, Ultrasonography was carried out as control and then bilateral cervical and PA (postero-anterior) chest radiograms were obtained, premedication was not performed. Under sterile circumtances, outlines of the thyroid was defined by tracheal palpation. A needle of 21 gauge was inserted into thyroid lobe in close to isthmus, with a slope of a 45 degree angle to the midline Fig 3 Needle was controlled by aspirating whether the blood came into the diyagram injector. 1,5 to 2ml. lipiodol ultrafluid was injected slowly within two minutes, and this was observed by floroscopy. The same procedure was applied to both lobest. Fifteen minutes, 1 h, 6 h and 24 h after injection, AP (antero-posterior) and lateral radiograms of the neck were obtained, at 24 th. hour, PA chest radiogram were also obtained. For thyrolymphographic application and radiograms a Picker Galaksy radiodiagnostic apparatus with the television camera and 500 mA was used. Radiograms were obtained with e beam dosage of 57-60 Kv., 0.5 second and 160 MAS. Distance of tube was 90 cm. In all cases (except 14 ultrasonography was used as a control procedure. 61 of the total 64 cases were examined by operating and 3 by taking the biopsy

Figur 3:The position of the needle in applying the thyrolymphography has been seen.

RESULTS

The cases experienced had stories ranging from one month to 20 years. There was a familial story in 13 cases (% 20.3). No cases had a stroy of sensitivity to iodine. The findings included the results of physical examination, ultsonography and thyrolymphography.

1. Clinical examination: In eleven cases hypertphyrodism, in 18 solitary nodule, in 298 multiple nodules, in 4 thyroid cancer, in 1 hyperparathyroidism, and in one other case aberrant thyroid were suspected. Histopathological comparison of these cases has been given in table 1.

2. Ultrasonograhpy: In 22 cases the solitary nodule was diagnosed preopeıatively. Of these, 12 were solitary solide and 10 cystic. The other 29 were diagnosed as multiple nodular goitre,.

3. Thyrolymphography: In 64 cases, thyrolymphographic evaluation reresiults were as follows: hyperthyroidism in 8, solitary nodule in 17, multiple nodule in 24, thyroid cancer in 7, parathyroid adenoma in 2, and normal parenchyma in 1 (Table 1).

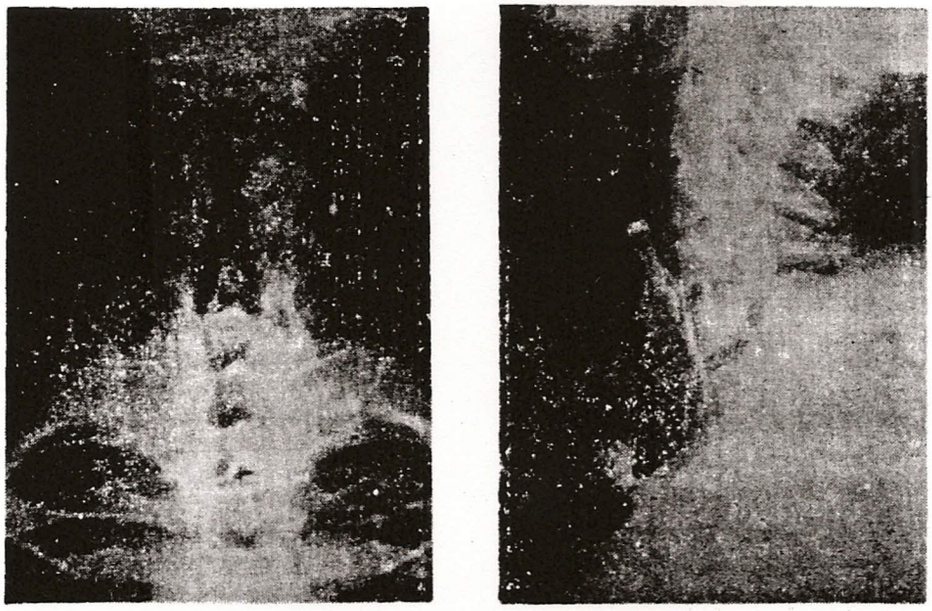
Thyrolmphography was unsuccessful technically in 4 cases.

In the patients with hyperthyroidism, the gland was hypertrophied and and rapidely opacified. After injection the contrast spread immediately within the gland, reached to regional lymph nodules during 10 to 15 minutes, and provided fine reticular view (Fig 4-14). A case in which thyrolymphography was unsuccessful was reported to have toxic hyperthroidism histopathologically.

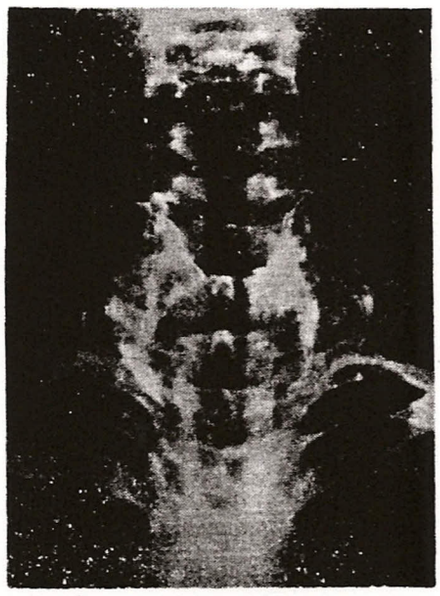
Solitary nodules were usually seen an oval, round, 0,5-3 cm in size, and well-defined filling defect in opacified thyroid (Fig 5). When the contrast was injected into the cystic nodule, contrast material initially floats as isolated droplets in cystic fluid, later settles to the base (Fig 6). On the erect radiogram was observed air-fluid level (fig 7).

Multiple nodules were also seen like solitary nodules, but single (Fig 8, 9 and 10). In a case with multiodular goitre, which was operated on 48 hours after thyrolymphography, taking its photograpyh, the spreading of the contrast material was observed in the thyroid (Fig 11).

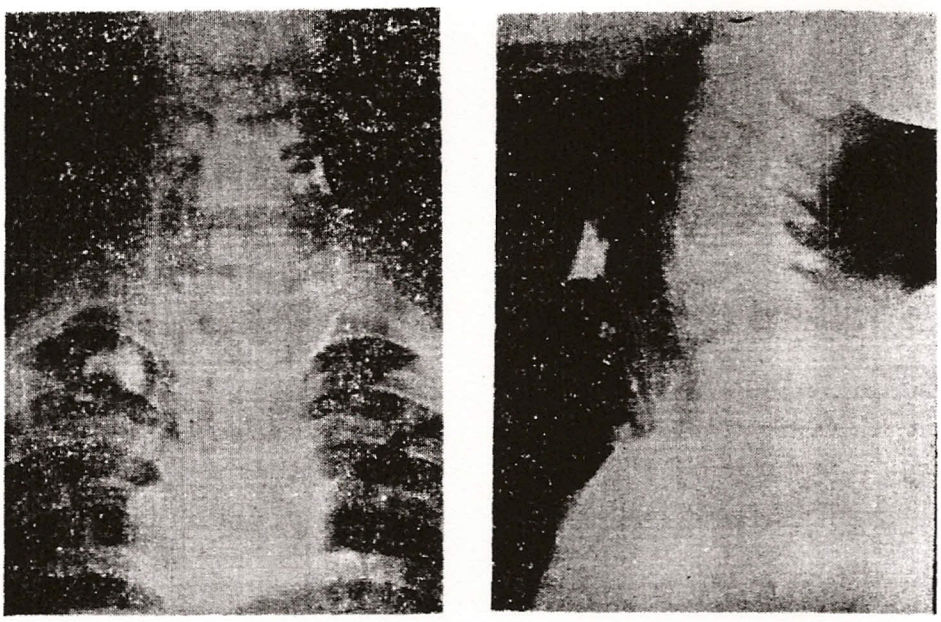
Both the thyroid parenchyma and nodule itself were seen with structural changes in the thyroid lymphography of the cases with thyroid cancer. The thyroid gland was irregularly grown and the spreading of the contrast material was in an amorphous pattern, and reticular view was lost. Thyroid parenchyma showed "pachy wool view,,, This view was specific for malignancy. This abnormal pattern may be related to change in the structure of the tumoral area (Fig 12).



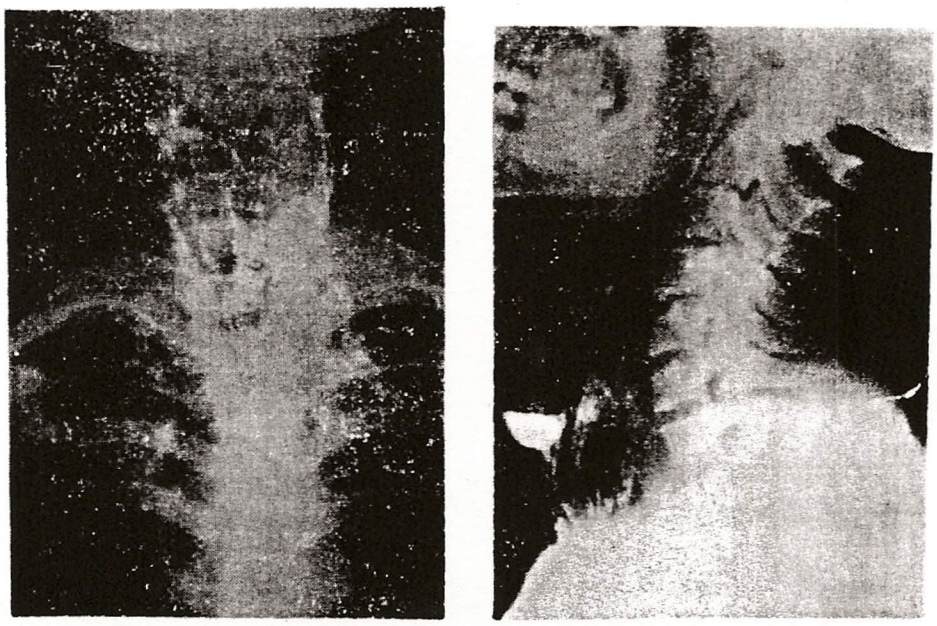
Figur 4.22 years old male, there are multiple nodules within reteticular view in the lower poles. It is seen that on radiograms 15 minutes after injection, the thyroid is enlarged and regional lymph nodes are visualized.



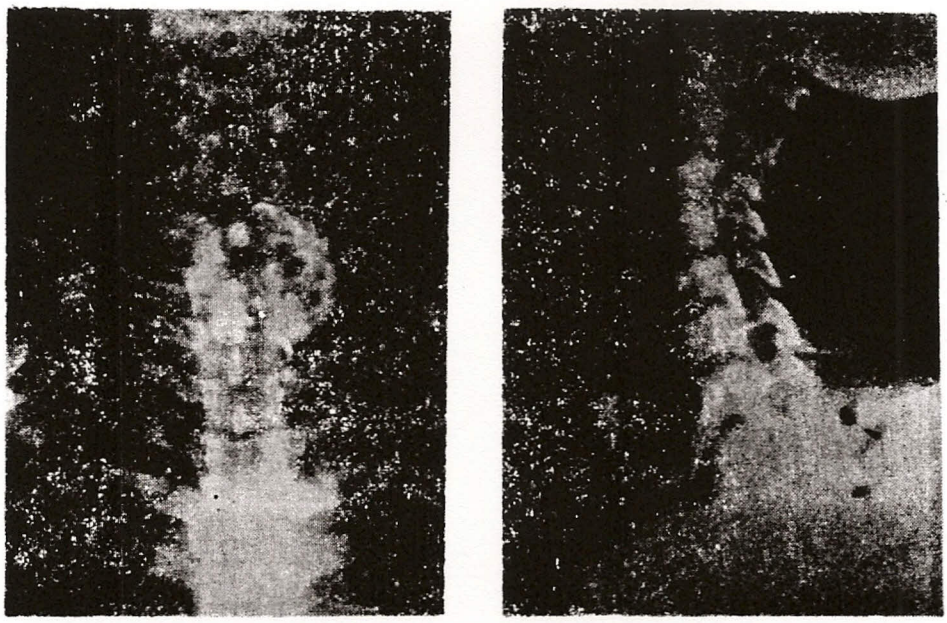
Figur 5.Solid solitary nodule, 21 years old male, two hours after injection the radiogram shows a solitary nodule of 3 cm diameter in the midline and that the contrast material reaches to regional lymph nodes.



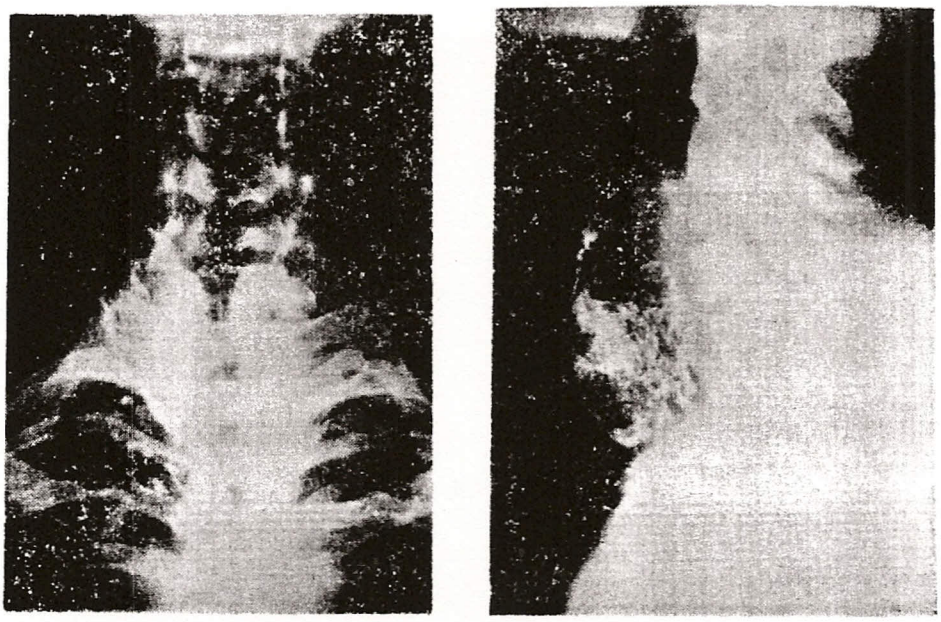
Figur 6. Cystic solitary nodule, 22 years old woman, two hours after injection the radiogram shows a cystic nodule with a dimension of 3x3 cm and contrast material floating as as drops within the cyst and precipitated.



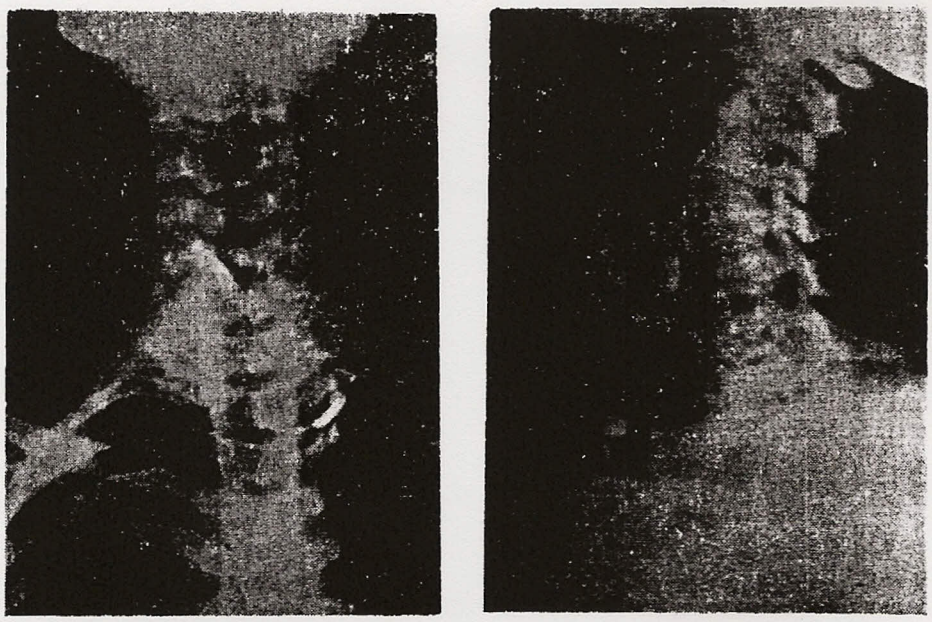
Figur 7. Thyroglossal cyst, 22 years old male, two hours after injection the radiogram shows a cystic nodule with a dimension of 2x2 cm and fluid level in the cyst.



Figur 8. Multinodular goitre, 21 years old woman, on the radiogram obtained 24 hour after injection, nodular filling defects are seen in lower right lobe (10x10mm) and left lobe (3-4 mm). In the right side, there are opacified cervical lymph nodes and bilateral cervical costa.



Figur 9. Multinodular goitre, 20 years old male, 2 hours after injection the radiograms show multiple filling defects in upper and lower poles of both lobes.



Figur 10. Multinodular goitre, 14 years old girl, on the radiogram obtained 2 hours after injection, various sized and multinodular filling defects have been seen within middle and upper zones of both lobes. Bilateral cervical lymph nodes are visualized.

Cervical lymph node metases were not seen, but the side with cancer lymph nodes did not fill (Fig 13). The injection of the contrast material was trouble, in the patients with cancer, since thyrolymphography wazs unsuccessful in one case.

A retrosternal goitre could be noteced by thyrolymphography in a case with hyperthyroidism, which had not been to detected by the other methods (Fig 14).

Cervical and mediastinal lymph nodes were able to be demonstrated a at a rate of 70.8 % and 18.8 % in our patients, respectively.

Cervical lymph nodes' opacification depends on the nature of the thyroird disease, but they have usually been able to be seen during the first two hour.

A case who was thought to have aberrant thyroid clinically was found to have a normal thyroid by thyrolymphography.

DISCUSSION

Although, scintigraphy of which the approch to solitary nodule is essentially in the form of reduction or disappearance of function, gives information about the size and function of the lesion, it causes misdiagnosis in several cases 8,13.

Table 1: The distribution of the lesions according to the diagnostic procedures.

Disorders	Methods								
	Clinical examin.			Ultrasonography			Thyrolymphograpnhy		
	NCD	NCtD	CDR(%)	NCD	NCtD	CDR(%)	NCD	NCtD	CDR(%)
Hyperthyroidy	11	9	80.1	—	—	—	8	8	100.0
Solitary nodule	18	9	50.0	22	18	81.8	17	15	88.2
Multiple nodule	28	18	64.2	29	27	93.1	24	22	90.1
Cancer	4	3	75.0	—	—	—	7	7	100.0
Parathyroid adenoma	2	2	100.0	—	—	—	2	2	100.0
Normal thyroid	—	—	—	1	1	100.0	1	1	100.0
Aberrant thyroid	1	—	—	—	—	—	—	—	—
Total	64	41	64.1	52	46	88.5	59	55	93.2

NCD : Number of clinical diagnosis,
NCtD : Number of correct diagnosis,
CRD : Correct diagnosis ratio.

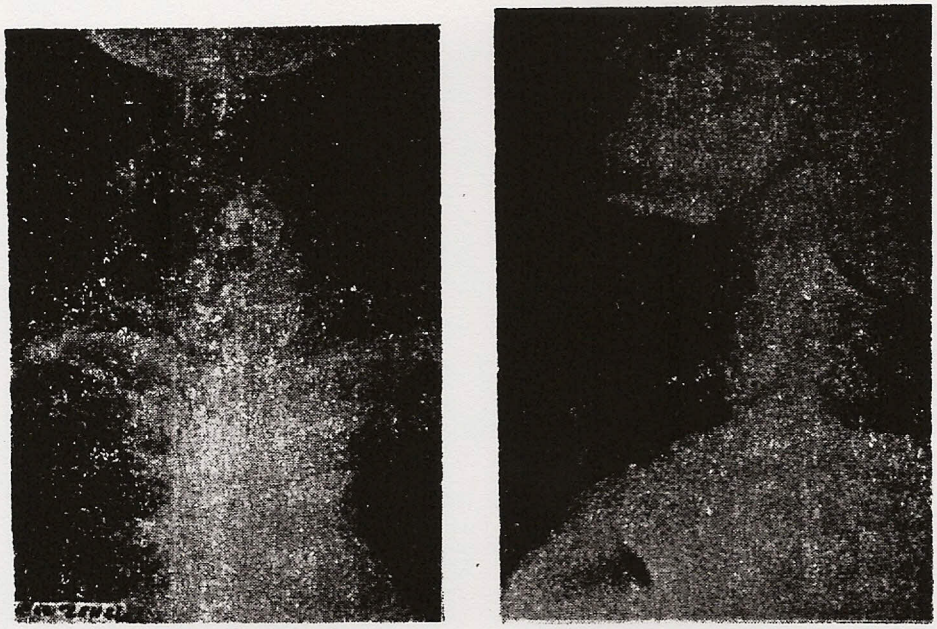
Figur 11. On operation material of multinodular goitre, 20 years old male, in photograph soon after operation multinodular capsul formation and contrast material residue are seen.

In the 50 % cases which scintigraphy reveals normal function, malignancy have been observed 4.13. Moreover, it is also impossible that scintgraphy distinguishes malignant from benign cases. Brown et ell 5, found malignacy in 25.2 % of cases which were diagnosed as hypoactive nodule by scintigraphy an in 12.2 % as active nodule. It is known that scintigraphy insufficient in determination of number of nodule at a rate of 22.5-48.0 %.

Although, the correct diagnosis rate is 10.0-90.0 % by needle aspiration biopsy, it is not accepted in general, because of the fact that it could produce malign cell implantation and also the tissue specimen may not be always taken from the lesion area.

It has been reported that ultrasound has been successful in the differantitiation of solid and cystic nodule but it can not differentiate benign and maling lesion. It is also insufficient in determining the nodules smaller than 0,5 cm in size.

Since Xeroradiography giving useful information in desecting of cyst wall and calcifications does not provide information about the structural properties of the nodule, the maling cases can not be differantiated.



Figur 12. Thyroid cancer, 45 years old woman, on the radiogram obtained 24 hours after contrast injection, it is seen that the gland is irregularly enlarged an the contrast materia has a "patchy wool' view.

Thermography is successful in thyroid nodule at a ratio 57.0 % and in parathyroid lesions 90-.0 % . Thermography has not been accepted because of its mistakes of 43.0 % in the diagnosis of the thyroid nodules.

The extensive studies have recently begun on thyrolymphography which can differentiate the thyroid cancer from other thyroid lesions and can give valuable knowledge concerning cervical lymph nodes. Consequently, in recent studies, it has been reported that thyrolymphography provides correct diagnosis in solitary thyroid nodule of 85.7-89.5 % and that it can also reveal lympn node at a rate of 67.0-75.0 % 2.11,22,23.

It has been considered that it is a valuable finding in determining of thyroid cancer that cervical lymph nodes can be showed, on the other hand, the diagnosis of malignancy can be made, since in thyrolymphoraphy morphologic changes which those can be criteria in differentiation of benign and malign are seen 3,6,7,8,9 10,14,15,17,19.

When we compare the thyrolymphographic findings with the histopatothogic ones, it has been seen that highest success was obtained in the hyperthyroidism and thyroid cancer (100.0 %).

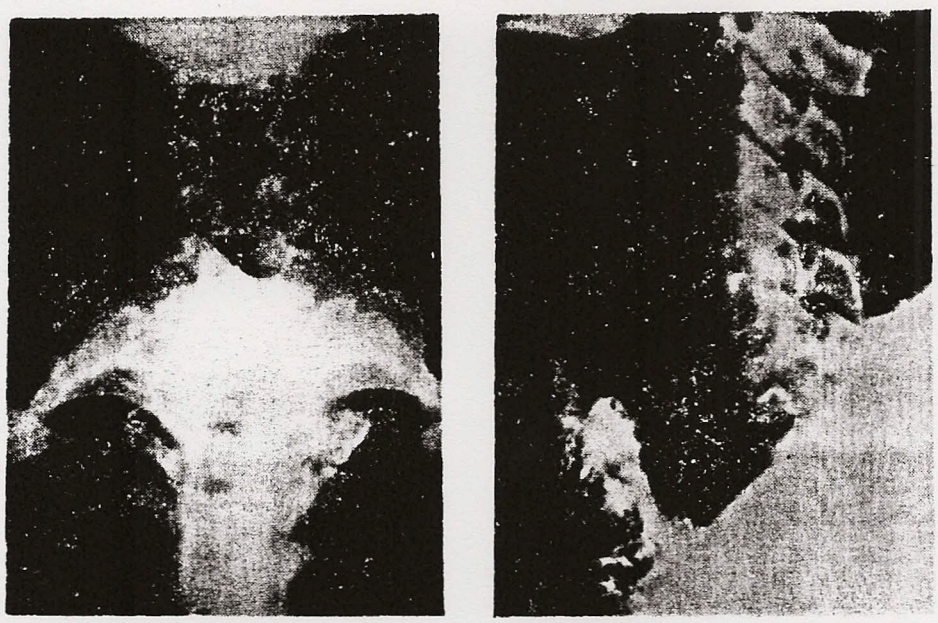
Figur 13.Thyroid cancer, eleven years old boy, on the radiogram obtained 24 hours after injiction, a solitary nuule with a dimension of 15x15 mm and cervical lymph nodes in the right, and irregularly stained thyroid tissue and nodular firmation in the left are seen. Because of tumoral blocage of cervical lymph nodes, they could not be seen.

In the studies of this subject, in hyperthyroidy, the correct diagnosis rate of 100.0 % and 90.9 % have been achived by Akaydın 2 and Smyrnis 22, and Kocaoğlu 11 respectively.

Although, excellent morphologic appearence is obtained by thyrolymphography, it is unclear that whether it provides knowledge about thyhroid functions.

Some investigators have accepted the fact that contrast material is distriributed fast in hyperthyroidism and slow in hypothyroidism as a reflaction of and slow in hypothyroidism as a reflaction of function 10,21.

In our study, succes of thyrolymphography was 88.2 %, .while success of clinic was 50.0 % in the recognition of the solitary nodule. On the other hand, differentiation solid-cystic could be done by control ultrasonography at a rate of 81,8 % It can be determined whether structural changes occurs in malignancy are present by observing the morphology of the nodule and surrounding thyroid tissue in thyrolymphography. Rosen 20 has reported that he could differentiate the solid and cystic nodules at a rate of 90.0 % but could not find criteria that could be used in differentiation of benign and malignant by ult-



Figur 14. Hyperthyroidism and retrosternal goitre, 20 years old male, on the radiogram obtained 15 min after injection, it is seen that thyroid is enlarged and is localized in retrosternal space and that the contrast reaches to the cervical lymph nodes.

rasonography. In present study,, in the case of multiple nodules, the success of the clinic, ultrasonography and thyrolymphography were 64.2 %, 93.1 % 90.1 % respectively. The small nodules up to 0.5 cm in size and the parenchyma of the thyroid gland were clearly detected by thyrolymphography. In the multinodular cases while Akaydın 2 has reported a correct diagnosis at a rate 95.4 % Kocaoğlu 11, Ören 18, Ram 19 and Smyrnis 22 have reported 100.0 % Success was achieved at a rate of 80.0 % by clinical examination and 100.0 % by thyrolymphography. The distribution of the contrast material was similar to „patcyh wool view" in malignant lesions. In the investigations by thyrolymphography, Akaydın 2 and Ören 18 have reported the correct diagnosis of 67.7 % Ram 19 100.0 % and Sachdeva 21 83.3 %.

In our study cervical and upper mediastinal lymph nodes could be seen at the ratio of 70.8 and 18.8 % respectively. In the previous studies, Sachdeva 21 has reported that he could demonstrate the servical lymph node (70.0 %) and mediastinal lymph node (10.0 %), and Ören 18 cervical lymph node (68.9 %). and mediastinal lymph node (22.8 %).

In this study, cancer at a rate of 12.7 %, hyperthyroidism 14.5 %, solitary nodule 27.2 %, nultinodular goitre 40.0 %, normal thyroid 1.8 % and adenoma of the parathyroid 3.6 % were determined by the technic of the thyrolmphog-

raphy. Ram et all 19 in their thyrolymphographic series of 53 cases, have obtained the diagnosis of the cancer 17.0 % hyperthyroidism 19,0 %, solitary nodule 35,8 % and multinodular goitre 13.2 %. Gandhi 10, in his thyrolymphographic study of 44 çases, has determined the cancer 16.0 %, hyperthyroidism 13.6 %, solitary nodula 11.3 %, and multinodular goitre 56.8 %.

In our study, since thyrolymphography was unsuccessful in the most advanced thyroid lesions at ratio of 7.8 %, and it was unable to show the superficial lymph nodes and thyroid lesions which were smaller than 0.5 cm, so it is unclear whether it gives information about thyroid functions. But on the other hand it can provide the differentiation of benign-malign, solid -cystic , and single-multiple nodule, gives the information about the variations of the thyhroid and cervical lymph nodes and could be aplied cheaply, simply and easily, and is successful at rate of 93.2 %. From all above we concluded that thyrolmyphography the was a radiological diagnostic method that provides an important easiness to physician in the direction of the treatment.

CONCLUSION

It was concluded that thyrolymphography was superior to the other diagnostic methods because of the following reasons and it could be useful when it is considered to applied with them.

1. The overal success of thyrolymphograhpy is 93.2 %, and can be easily applied in every hospital having an apparatus of radiography.

2. It can differentiate the benign- malign nodules as well as it determines the quality and quantity of the thyroid nodules.

3. It shows the small nodules up to 0.5 cm and the thyroid tissue a part from the thyroid nodules well.

4. It gives helpful knowledge about the diagnosis and treatment of the other thyroid diseases and the lesions of the head, neck and parathyroid.

5. It is superior to ultrasonogrophy because it can differentiate benign and malign lesions.

6. When the thyrolymphography is applied with the physical examination, the thyroid function tests, scanning, ultrasonography and especially needle aspiration biopsy, it provides important advance in the diagnosis and treatment, because information about the thyroid function and morphology could compansate each other's findings.

7. Thyrolymphography has some limitations, technical insufficiency at a rate of 7.8 % , gives unclear informations about the thyroidial functions, and unable to show adequately the superficial lymph nodes.

8. It is yet unclear ,whether it forms the tumoral cells implantations and it is harmful to the treatment I 131.

9. It has been concluded that more studies were necessary to find out the reliability of the pathy-wool appearance in the deiagnosis of the thyroid cancer.

SUMMARY

In this study, we tried to determine the diagnostic value, and importance of the thyrolymphography in evaluations of the thyroid diseases, by appliying the ultrasonography and thyrolymphography to 64 patients in whom it was though that they had thyroid lesions. The obtainad results were compared to the histopathologic findings. The correct diagnosis was achieved at a rate of 64.1 % by clinical examination and the differentiation of the solid and cystic lesion at a rate of 88.5 % by ultrasonograhpy, a success of 93.2 % was obtained by thyrolymphography. It has been found that thyrolympography was more successful especially in the the cases thyroid cancer and hyperthyroidism were thought to be present. Additionally the cervical lymph nodes at a rate of 70.8 % and mediastinal lymph nodes at a rate of 18.8 % were showed.

As a result, it was concluded that thyrolymphography was an important diagnostic method in setting the preoperative treatment when used togelher especially with the needle aspiration biopsy, and giving excellent morphological appearance , showing the small nodules up to 0.5 cm, and differantiating the benign-malign and solid-cystic apperances.

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