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Investigation of Retroperitoneal Lymph Nodes in Hodgkin's Disease

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ABSTRACT

For staging of Hodgkin's disease 45 patients underwent lymphography and abdominal computed tomography (CT); in 31 of them ultrasound examination was also performed. In cases of retroperitoneal lymph node enlargement lymphography and CT are diagnostically equivalent, whereas the poorer resolution of ultrasound reduces the reliability of this method when the lymph nodes are only slightly enlarged. Theoretically with lymphography also small lymphomatous lesions in normal-sized lymph nodes should be possible to demonstrate, but there is a clear tendency to overdiagnosis. CT is therefore recommended as the initial method and this examination is considered sufficient both in clearly negative and clearly positive cases. In doubtful cases and in those where CT has revealed solitary slightly enlarged lymph nodes, the examination should be supplemented with ultrasonic scanning and lymphography.

INTRODUCTION

In Hodgkin's disease it is important for the planning of appropriate therapy and for the prognostic evaluation to determine the extent of the disease. Until a few years ago lymphography was the method of choice for examination of retroperitoneal lymph nodes. The advent of computed tomography (CT) and ultrasonography has brought new possibilities of investigating the retroperitoneal space. Opinions are divided, however, as to whether these methods should be regarded as supplementary to or substitutes for lymphography. We have previously suggested that lymphography can be replaced by CT and ultrasound in abdominal investigations in patients with malignant lymphoma (13). In that study malignant lymphoma was dealt with as one homogeneous group. Hodgkin's disease differs, however, from other malignant lymphomas, for example in that the infiltrated lymph nodes often are of normal size or are only slightly enlarged (6). The present series reports our

experiences with lymphography, CT and ultrasonography in retroperitoneal lymph node involvement in Hodgkin's disease.

MATERIAL AND METHODS

During the period January 1978 to September 1983, 45 patients with histopathologically verified Hodgkin's disease underwent CT and bipedal lymphography. Forty-one of the patients were newly diagnosed, while 4 had received treatment previously. Thirty-one patients had also undergone ultrasound examination of the pelvis and abdomen. As a rule CT was the initial examination. Staging laparotomy was undertaken in 8 patients within 3 months after the examinations.

CT was performed from the symphysis pubis to above the domes of the diaphragm, in most cases with an Ohio Nuclear Delta 50 FS whole-body CT unit, with a scanning time of 18 seconds. The slice thickness was 13 mm and the distance between the slices was 26 mm. For the last 7 examinations a Siemens Somatom DR 2 unit was used, with a scanning time of 4.5 seconds and a slice thickness of 8 mm. In the pelvis the distance between the slices was 20 mm and from the aortic bifurcation in the cranial direction it was 10 mm. Routinely, the patients were given 300 ml of a 2.5% solution of Gastrografin® (370 mg I/ml) orally one hour before the examination and a further 300 ml immediately before the start of it. Lymph nodes with a diameter of more than 10-15 mm, depending upon the level in the abdomen (14) were regarded as pathologically enlarged.

Lymphography was performed with injection of 6 to 8 ml Lipiodol Ultra Fluid® (Guerbet) into a lymph vessel on the dorsum of each foot. Films were taken in a.p. and oblique projections, after the injection of contrast medium and 24 hours later. Diagnostic criteria for Hodgkin's disease described by Abrams (1) and Davidson & Clarke (8) were used in the evaluation of the lymphographic findings.

Static B-mode ultrasound scanning with a Philips Sono Diagnost B apparatus, and dynamic scanning with an ATL sector scanner (Mark III, 3 MHz) were performed; during the last years only dynamic ultrasound was used. Lesions of low echogenicity around the great vessels in the retroperitoneal region were considered to be pathologic lymph nodes.

RESULTS

In 30 of the 45 examined patients both the lymphographic and the CT findings were considered normal (Table 1); 22 of these 30 patients also underwent ultrasound examination (Table 2), in all cases with a negative result.

Six of these patients were laparotomized and in 5 of them all lymph node biopsies were negative. One of these patients, however, had lymphomatous changes in the spleen. In one patient who underwent laparotomy $2\frac{1}{2}$ months after lymphography and CT, all lymph node biopsies were positive; the infiltrated lymph nodes, however, were of normal size. A further 13 patients in this group have not received any therapy to the abdomen, and of these, 11 have been free from recurrence for 1 to 5 years.

Table 1.

Correlation between computed tomography and lymphography in 45 patients with Hodgkin's disease.

Computed tomography	No.	Lymphography			
		normal	abnormal		
			total	normal-sized nodes	enlarged
Normal	37	30	7	5	2
Abnormal	8	2	6		6

Table 2.

Correlation between lymphography, computed tomography (CT) and ultrasound (US) in 31 patients with Hodgkin's disease; (+) indicates positive and (-) negative findings.

Lymphography	No.	CT-/US-	CT-/US+	CT+/US-	CT+/US+
Normal	22	22			
Abnormal	9	4	2	2	1

In the remaining 15 patients the outcome of one or more of the examinations was positive (Tables 1 and 2). In 5 of these the lymphographic diagnosis was a pathologic structural pattern in normal-sized lymph nodes. The findings at CT were negative in all these 5 patients. Four patients were examined with ultrasound with a negative result. Two of the 5 patients were laparotomized and nothing abnormal was found. In the remaining 3 patients the findings lacked histopathologic confirmation. Two of them have received abdominal radiation therapy and one patient, who has not been given such treatment, has been free from recurrence, but so far the observation period is only one year.

In 2 other patients both lymphography and ultrasound revealed solitary pathologic, clearly enlarged lymph nodes in the pelvis, whereas CT was negative. Nor can these lymph nodes, with diameters of 2-3 cm, be identified retrospectively on the CT scans.

In 2 further patients lymphography gave normal results, while the findings at CT were considered to be pathologic. Neither of these patients was examined by ultrasound. In one of them CT revealed enlarged lymph nodes outside the lymphographic area and in the other one the CT diagnosis was probably wrong, as this patient did not receive any therapy to abdominal lymph nodes and is still free from recurrence after $3\frac{1}{2}$ years.

In 6 patients both CT and lymphography gave positive results. As a rule the lymph nodes in these cases were only slightly to moderately enlarged (Fig.1) and only in one case were conglomerates of lymph nodes found. Three patients in this group underwent ultrasound examination; in one of them the findings were positive and corresponded to those at both CT and lymphography. In the other two patients the ultrasound result was negative.

When the lymphograms were compared with computed tomograms, it was noted that at CT slightly to moderately enlarged lymph nodes were most easily demonstrated in the left para-aortic chain and were more difficult to identify in the para-caval chain.

DISCUSSION

In Hodgkin's disease, the diagnostic method which gives the best information about the extent of the disease in the abdomen is staging laparotomy with splenectomy. This operation has been questioned, however, as it does not improve the prognosis with certainty and as splenectomy implies a risk of fatal pneumococcal sepsis (2,9), therefore in several hospitals, including our own, it is not performed. The demands upon the radiologic investigation have therefore increased further.

By lymphography, with its superior spatial resolution, minor lesions in normal-sized lymph nodes can, theoretically, be demonstrated. For this reason several authors consider that lymphography is the method of choice for diagnosis of lymphomatous involvement in the abdomen in Hodgkin's disease (5,6,10, 17). The findings at lymphography are difficult to evaluate, however, and a reliable diagnosis requires an experienced radiologist with a high frequency of examinations. MARGLIN & CASTELLINO (15) have recently presented a material in which the lymphographic findings were compared with the histopathologic results in 416 patients with Hodgkin's disease. The sensitivity, specificity and over-all accuracy were high in that material - over 90 per cent. However, the

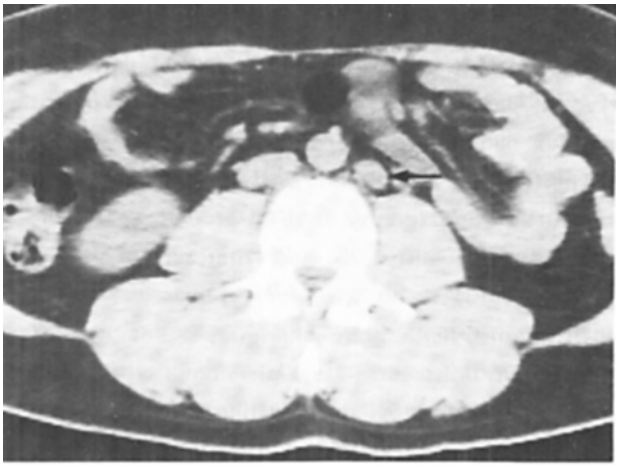

Fig. 1 a. CT scan of the middle part of the abdomen. To the left of the aorta there is a slight enlarged lymph node (arrow).

Fig. 1 b. Lymphography. Several slightly enlarged lymph nodes with a pathologic structural pattern are seen at the level of LIII-IV. The level of the CT scan is indicated.

number of false positive results was relatively large, so that one of five patients with a positive diagnosis at lymphography was histopathologically negative at laparotomy. This tendency to overdiagnosis is even more marked in smaller materials, where the degree of experience is lower. In a series of 62 patients (32 with Hodgkin´s disease, 30 with non-seminomatous germ cell tumours) reported by DAVID et coll. (7), 26 had positive diagnosis at lymphography, but only 20 had histopathological positive results. In a series of patients (13), who were selected so as to include only laparotomized patients with minor lymph node changes, 11 of 12 patients with suspected lymphomatous lesions in normalsized lymph nodes at lymphography were negative at laparotomy. A tendency to overdiagnosis was also evident in the present material; thus in 5 patients lymphography revealed an apparently pathologic structural pattern in normal-sized lymph nodes and 2 of these patients have undergone laparotomy with a negative result.

Accuracy rates for CT and ultrasonography in the evaluation of retroperitoneal lymph nodes in Hodgkin's disease have been reported (3,4,6,7,11, 12), but these series are definitely smaller than those dealing with lymphography on the same subject (15). The non-invasive methods have several advantages, however, over lymphography, being easy to carry out and well accepted by the patient. Moreoever, in contrast to lymphography, with both of these methods all lymph node groups in the abdomen as well as liver and spleen may be examined. The nodes must, however, be enlarged, as neither of the methods permits an evaluation of the internal lymph node structures.

The possibility of demonstrating lymphomatous infiltrates in iliac lymph nodes by CT has not been investigated to any great extent. LACKNER et coll. (12) reported a sensitivity of 81% and a specificity of 90%, but the histopathologic verification was incomplete. In our experience the diagnostic reliability was lower. In two patients in the present material, clearly enlarged lymph nodes were not detected at CT, whereas both ultrasound and lymphography demonstrated these nodes. The less good results of CT in the pelvis may have been due partly to the fact that our examinations were performed with an older equipment with relatively low geometric resolution, and the results with modern CT equipment seem to be better.

One drawback with ultrasonic scanning of the retroperitoneal space is that the examinations are often unsuccessful because of interference by intestinal gas (16). This is largely attributable, however, to the use of the static B-mode scanning technique. When a dynamic sector scanner is used, interfering gas-containing intestines can often be displaced and the abdomen compressed with the transducer, so that the entire retroperitoneal space can be evaluated. The outcome of an ultrasound examination is largely dependent, however, upon the proficiency of the examiner. Moreover, the poorer resolu-

tion of the ultrasound method implies that the sensitivity at examination of para-aortic lymph nodes is lower than that of CT. Consequently, ultrasound is insufficient as the only examination, but is of great value as an adjunct to CT.

We recommend CT as the initial method, as this is sufficient with clearly positive findings and also with clearly negative findings. CT should be sufficient since the diagnostic reliability of lymphography in discrete changes in normal-sized nodes is low (13). In cases where CT reveals solitary slightly enlarged lymph nodes, ultrasound examination and lymphography are also performed. The criteria for a positive diagnosis at lymphography then have to be stringent, in order to avoid a large number of false positive results.

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