newest Polaroid film, TLX, has the advantages of wide radiographic technique latitude because of its ability to be viewed by reflected and transmitted light. Within 45 seconds, the Polaroid radiograph will show clearly by the characteristic oil pattern whether the catheter is situated within a lymphatic channel, or vein, or is leaking into the subcutaneous tissues.

This procedure reduces significantly the danger of intravascular injection since with a minimum of 0.2 ml of oil, proper positioning of the catheter can be determined. In addition, it has been shown by other investigators[5] that the roentgen exposure for a Polaroid radiograph is less than for a routine radiograph.

Conclusion

Polaroid radiography offers a rapid and convenient method to determine the exact position of the lymphographic catheter needle when its location is in doubt. This simple technique only slightly increases the total cost of the procedure but its value in minimizing intravascular injection of an oil contrast medium offsets this disadvantage. In addition, the total radiographic exposure to the patient is considerably less than it would be if fluoroscopy or standard radiographic procedures were used.

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Comment: How Shall we Look at Hodgkin's Disease?

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The paper by Drs. *Lennert* and *Mestdagh,* Virchows Arch., Vol. 344; 1, 1968 (see abstract p. 33) goes to great length in adding a minute histologic differentiation of Hodgkins disease to an already crowded field of literature. The European terminology is different than that used in the United States and the article is somewhat confusing. The following discussion may shed some light on the subject.

Prior to the second World War *Jackson* and *Parker* subdivided the disease into three histologic types; namely paragranuloma, granuloma and sarcoma. In the past decade Hodgkins disease has been clinically subdivided into anatomic stages, depending upon the extent of the disease at any point in time (1). Thus, stage I applies where the disease is localized to one anatomic region; in stage II the disease is in more than one

anatomic region which may be contiguous or non-contiguous but is one the same side of the diaphragm; stage III is disease on both sides of the diaphragm but not extending beyond the involement of the lymph nodes, or spleen; and stage IV includes the above with the involvement of bone marrow, lung, pleura, liver, bone, skin, kidneys, GI tract, etc. These stages are complicated by the presence or absence of clinical symptoms, including fever, night sweats and or pruritus.

Lukes (2) has been instrumental in developing a new histologic classification of Hodgkins disease into four distinct groups which has gained international approval. The classification (3) depends to a great extent upon the presence or absence of lymphocytes as well as the degree of fibrosis.

The first type is called Lymphocyte Predominance in which the histiocytic component is variable and may be prominent in 50% of the cases. The process may be nodular or diffuse in histologic pattern. This type includes the former designation of paragranuloma and many cases of granuloma.

Type two is Nodular Sclerosis. This type is primarily found in the mediastinal area and consists of broad bands of fibrous tissue which enclose the proliferation cells in small or large nodules.

Type three is the Mixed cellularity type. This type is intermediate (indicating a changing pattern of disease) and includes a complete variety of histological components, that is eosinophils, plasma cells, mature polymorphonuclear leukocytes, lymphocytes, histiocytes and Reed Sternberg cells. There is some associated fibrosis but the collagen is not birefringent. Many former cases of granuloma fall into this category.

The fourth type is the Lymphocyte Depletion type of Hodgkins disease. There may be diffuse fibrosis in which the collagen is birefringent. It includes the sarcoma type designated by *Jackson* and *Parker*.

The characteristic Reed-Sternberg cells may be found in all groups although they vary in number and are scarcest in the first type or lymphocyte predominant. It is important to realize that atypical reticulum-like cells may be common in all stages especially in the lymphocyte predominant group and the presence of these cells does not warrant a diagnosis of Hodgkins disease. One must still find the caracteristic Reed-Sternberg cell which is present in either mirror image or bilobed cells or in giant cell formations. There is an inverse relationship between the number of Reed-Sternberg cells and lymphocytes in a given tumor.

These findings have been confirmed by other workers and result in the observation that the nodular sclerosis type, predominantly in the mediastinum, is more prevalent in younger patients and especially in females than in other groups. All workers in the field have noted that this type carries an excellent prognosis.

Recently, *Keller, Kaplan, Lukes* and *Rappaport* (4) have published a retrospective study on 176 previously untreated cases of Hodgkins disease using their classification and followed with deep radiotherapy. They devised a prognostic index utilizing systemic symptoms, clinical staging and histologic type and on a projected actuarial five year survival table they found that histologic typing goes along well with five year prognosis. Thus, the lymphocytic predominant type was found primarily in

patients with clinical stages I and II. The lymphocytic depletion type was largely found in stages III and IV. Out of their 176 patients, the nodular sclerosis type was the largest histologic group and had a favorable prognosis. The survival in all types appears to be longer after deep wide field mega-voltage X-ray therapy than in untreated cases.

It is clearly evident that the classification of Hodgkins disease into these four relatively easy distinguishable types, combined with clinical anatomic staging, renders more comprehensability of Hodgkins disease than the older division into paragranuloma, granuloma and sarcoma. It is also easier to grasp than the European description of epitheliod cell lymphogranulomatosis with small foci of epitheliod cells (in regular arrangement) as compared to lymphogranulomatosis having areas of numerous epitheliod cells (so called lymphogranulomatosis rich in epitheliod cells). This type of terminology is most confusing and should be abandoned.

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ABSTRACTS

Basic Science

Borum, K. (Dept. of Rheumatol., Univ. Hosp., Lund, Sweden): **Pattern of Cell Production and Cell Migration in Mouse Thymus Studied by Autoradiography.** Scand. J. Haematol. 5 (1968), 339–352

The pattern of cellular proliferation and migration in the mouse thymus has been studied using tritiated thymidine autoradiography on smears and histological sections at intervals from one hour to 14 days after a single intraperitoneal injection of 2 μc per g of thymidine-H^3 (specific activity 3 c per mM). In smear preparations about 13 per cent of the cells were labeled one hour after administration of thymidine-H^3. Only about 2‰ of the cells were labeled small lymphocytes at this interval, increasing to about 30% at 72 hours. The localization of labeled cells was estimated on the sections: Initially the labeled cells were located mainly in the superficial layer of the cortex, followed by a period when the whole cortex appeared equally labeled. After about 4 days a concentration of labeled cells was seen at the cortico-medullary border. In the medulla there were few labeled cells initially. The amount of labeling increased from the second day, reaching a maximum at day 4 to 5. Some labeled cells were found also in blood vessels of the medulla.

It is concluded that an extensive cell production takes place in the thymus, especially in the outer cortex, the end result being the production of small thymocytes which migrate to the medulla from where they leave the thymus.