

STAGING LAPAROTOMY WITH SPLENECTOMY IN HODGKIN'S DISEASE

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Abstract. The series includes 91 patients with Hodgkin's disease who underwent a staging laparotomy with splenectomy during the years 1971-1976, in 82% of them as part of the initial evaluation before therapy. Positive abdominal lymph nodes were found in 29% of the patients, a positive spleen in 37%, and a positive liver in 10%. Follow-up of patients who lacked abdominal involvement at laparotomy indicate that sampling error was only of marginal importance. Evaluation of the therapeutic implications of the operation indicated that 41% of the patients benefited from the procedure; 31% by changing stage and 10% by changing radiation therapy port. Five patients had minor surgical complications. The mortality rate was nil.

The remarkable achievements made in the treatment of Hodgkin's disease in the past decade may be due to better staging of the disease and better therapeutic tools.

The important role of the spleen and other abdominal tissues as a site of Hodgkin's disease was stressed already by Hodgkin (1832), but it remained for Glatstein et al. (1969) to rediscover the abdomen as an area of utmost importance in the staging of Hodgkin's disease.

During the last decade the reports on the findings at staging laparotomy with splenectomy in Hodgkin's disease have rapidly increased in number. In unselected consecutive patients the spleen and the abdominal lymph nodes have generally been found to be affected in 30%-40% of the patients, whereas the liver has only been found to be involved in about 10% of the patients. Liver involvement has only been seen in the presence of involvement of the spleen.

The results of staging laparotomy with splenec-

tomy in Hodgkin's disease have usually been reported to have had therapeutic implications in about one third of the patients subjected to the operation (Cannon et al., 1976).

Staging laparotomy with splenectomy was adopted as a routine procedure in Hodgkin's disease at the University Hospital of Lund in April 1971. The results of the first 32 operations were analyzed and reported 1974 (Landberg et al.).

The patient series has now expanded to include 91 patients, and the purpose of this report is to analyze the results and side-effects of these operations.

MATERIAL AND METHODS

The patient series includes 91 patients (Fig. 1), 61 males and 30 females, and the age of the patients ranged between 6 and 65 years. Most patients were below the age of 35.

The distribution on histologic types in the biopsy specimens appears in Table I. The Nodular Sclerosis type was the most frequent one, and Mixed Cellularity the next most common one.

The preoperative staging procedures included as a rule routine blood examinations, X-ray examination of the chest and skeleton, lymphography, i.v. urography, examination of the nasopharynx, bone marrow biopsy, scintigraphy and percutaneous fine needle aspiration biopsy of the liver and spleen.

All patients had their staging laparotomy with splenectomy performed at the Department of Surgery, University of Lund Hospital. The operation was usually performed via a left transrectal incision, and included splenectomy, wedge biopsy and needle biopsy of the liver and multiple lymph node sampling. If possible, lymph nodes at the root of the coeliac axis, at the porta hepatis, along the vertebral column at different levels, along the splenic pedicle, at the root of the mesentery and along the

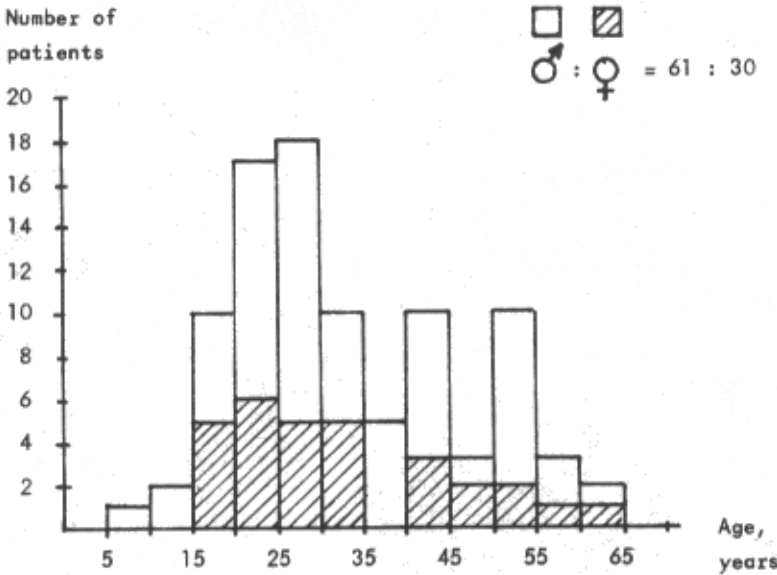


Fig. 1. Distribution of patients on sex and age.

iliacs were sampled. The lymphography served as a guide to choose proper sites for node sampling. The sites where the lymph nodes extirpations were made were marked with silver clips.

In 75 of the patients (82%) staging laparotomy with splenectomy was performed as part of the initial diagnostic work up. In 16, the operation was performed as part of a re-evaluation examination after previous therapy.

RESULTS

The results of staging laparotomy with splenectomy in 91 patients appear in Table II. Twenty-nine per cent of the patients had positive lymph nodes, 37% had a positive spleen and 10% had a positive liver. In some patients only one of these abdominal tissues were involved, namely in 4 patients who only had involvement of the abdominal lymph nodes and in 11 patients who only had splenic involvement, all in addition to extraabdominal disease. No patient

had the liver affected as sole abdominal manifestation.

The weight of the spleens affected and not affected by Hodgkin's disease appear in Fig. 2. Spleens not involved by Hodgkin's disease usually had a weight of less than 350 grams, but of 2 affected spleens, 19 also weighed less than 35 grams.

In 77% of the patients agreement was found between the lymphographic readings and the lymph node biopsies (Table III). In 23% of the patients there was disagreement, and then most often a positive biopsy when lymphography had been read a negative.

The complications of surgery are listed in Table IV. Five patients had complications but all recovered uneventfully. There was no operation mortality. In addition to those listed in Table IV, 5 patients had short episodes of fever.

Table I. Distribution on histologic types of 91 patients, submitted to staging laparotomy with splenectomy

Histologic type	No. of patients	Per cent of total
Lymphocyte predominance	17	19
Mixed cellularity	30	33
Lymphocyte depletion	3	3
Nodular sclerosing type	39	43
Not classified	2	2

Table II. Results of staging laparotomy with splenectomy in 91 patients

Positive findings (number of patients and per cent of total at laparotomy

	Lymph nodes	Spleen	Liver
Totally	26=29%	34=37%	9=10%
Thereof as only site of abdominal involvement	4=4%	11=12%	0

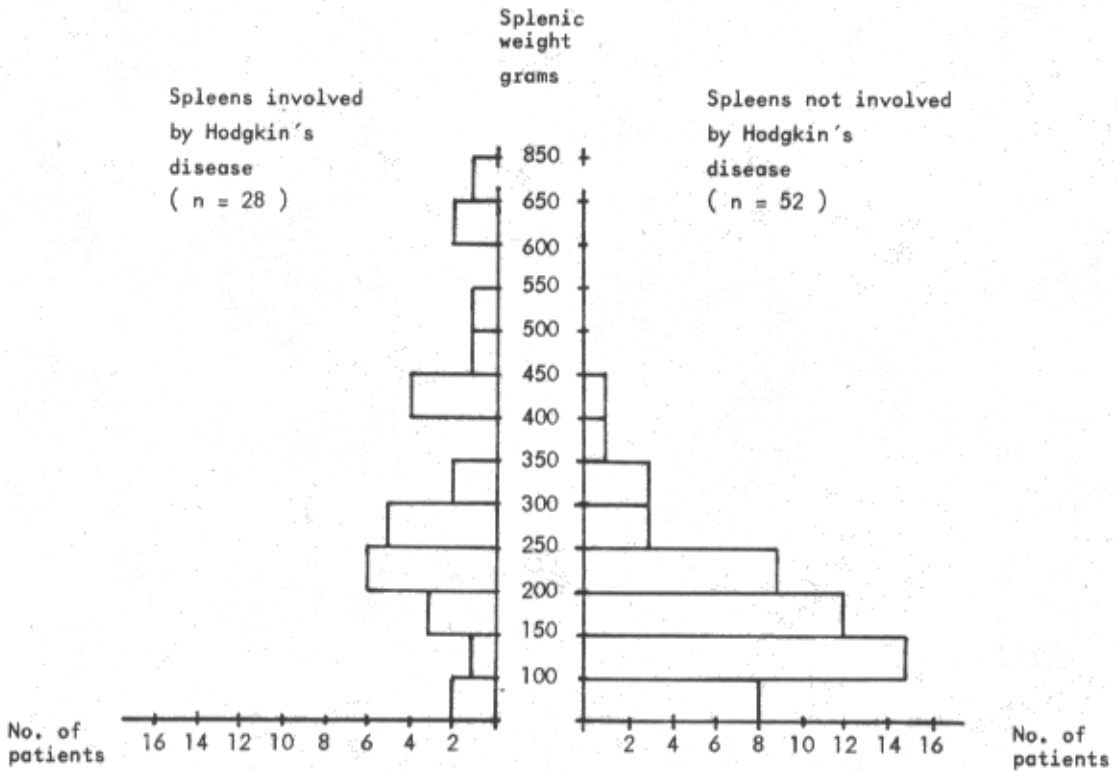


Fig. 2. Spleens involved and not involved by Hodgkin's disease, distributed among different splenic weights.

The mean time for hospital in-ward care for this surgery was 7 days, with a range of 4-14.

The distribution of the 91 patients on different stages before and after surgery appear in Table V. Before laparotomy 57 patients were considered to be in stages I or II (having no abdominal disease), 28 to be in stage III (mainly due to presumed abdominal disease) and 6 to be in stage IV (extralymphatic disease). After surgery 52 were staged I or II, 31 staged III and 8 staged IV.

Table III. Comparison between lymphography readings and findings at laparotomy

	No. of patients	Per cent of total
Agreement	70	77
Lymphography positive, biopsy negative	8	9
Lymphography negative, biopsy positive	13	14

DISCUSSION

The preoperative staging procedures included *inter alia* X-ray examination of the lumbar spine and the pelvis, a bone marrow biopsy, i.v. urography, examination and biopsy of the nasopharynx, and percutaneous fine needle aspiration biopsy of the liver and spleen.

For evaluation of the lumbar spine and the pelvis, films obtained at lymphography before the injection

Table IV. Surgical complications in 5 out of 91 patients (=5%) subjected to staging laparotomy with splenectomy

	No. of patients
Wound rupture	1
Subphrenic abscess	1
Ventricular arrhythmia during surgery	1
Sepsis? after surgery	1
Postoperative pancreatitis	1
Mortality	0

Table V. Number of patients in different stages before and after staging laparotomy with splenectomy

Twenty-eight (31% of total) patients had B-symptoms (=fever, night sweats and/or weight loss). Staging according to Carbone et al. (1971)

Stage	No. of patients	
	Before laparotomy	After laparotomy
I A	29	30
I B	4	2
II A	18	14
II B	6	6
III A	12	18
III B	16	13
IV A	4	1
IV B	2	7

of the dye, were used. Thus the examination load on the patient and on the X-ray diagnostic department were kept at a minimum. The frequency of a positive skeletal X-ray, which mainly represents involvement of the compact parts of the osseous tissue examined, has been reported to be of the order of 12% (Fucilla & Hamann, 1961). If other examinations are also used such as scintigraphic methods and bone marrow biopsy, the frequency of skeletal involvement is reported to be of the order of 37% (Ferrant et al., 1975), due probably firstly to a more sensitive detection of osteoblast-osteoklast-activity, and secondly to detection of bone marrow involvement. Most of the bone marrow biopsies in the present series were performed according to Gidlund. No patient in the present series had symptoms or signs of skeletal involvement.

The value of i.v. urography in Hodgkin's disease is very limited. Even when performed in connexion with a cavography (Laurin, 1975), the diagnostic yield is, compared with lymphography, very poor.

Examination and biopsy of the nasopharynx was initially introduced in the routine staging procedures in Hodgkin's disease in Lund to see, how often such involvement could be demonstrated. Analysis of the first 38 patients so examined (Biörklund et al., 1975) showed such involvement to be present in 7 patients, many of whom lacked local symptoms or signs of this involvement. This surprisingly high frequency has not yet been confirmed or contradicted by other reports, but it

seems at present to be warranted to include this relatively simple procedure in the staging procedures of Hodgkin's disease.

Percutaneous fine-needle biopsy of the liver and the spleen have been used as a routine in the present series. There have been no serious complications. An analysis of the patient series reported before (Landberg et al., 1974) showed that 29 patients out of the 32 had a percutaneous aspiration biopsy of the liver, which agreed with the liver biopsy in 27 patients (2 false negative cytologic examinations). Twenty patients had a percutaneous aspiration biopsy of the spleen, and in 19 there was agreement between cytology and histology of the excised spleen. In some patients percutaneous fine needle aspiration biopsy of the liver and spleen may be of value when determining the indication for a staging laparotomy. In case of a positive cytology of the liver, laparotomy may be unnecessary, since chemotherapy will usually be the treatment of choice. In case of a positive cytology of the spleen, the liver must be considered to be at high risk for involvement, and the indication for a laparotomy accordingly strengthened.

It appears from Fig. 2 that the size of a spleen usually does not allow for conclusions regarding the presence or absence of its involvement by Hodgkin's disease. This was also stressed by Glatstein et al. (1969). Thus a preoperative determination of the size (and presumed weight) of the spleen is of only very limited value.

In patients with a positive spleen, splenectomy is not only a diagnostic procedure, but also a debulking operation, and further enables the radiotherapist to use smaller target volumes, thus diminishing the radiation absorbed dose to the left kidney and the base of the left lung. It has also been reported (Nies & Creger, 1967) that after splenectomy patients

Table VI. Therapeutic implications of staging laparotomy with splenectomy in 91 patients

Reasons for change in therapy because of laparotomy findings	No. of patients	Per cent of total
Change to more advanced stage	18	20
Change to less advanced stage	10	11
Change in radiation port	9	10
Total	37	41

with malignant lymphomas such as Hodgkin's disease tolerate chemotherapy better when judged by means of white cell count and platelet count, and the same has been reported to be true for extended-field radiotherapy (DiBella et al., 1973).

Whether a better staging also means better results of therapy is not clear and this problem is linked to the general policy of treatment in the center concerned and to any harmful effects of the operation, e.g. splenectomy. Removal of the spleen may be potentially harmful in 2 different ways. Firstly the basic disease process in Hodgkin's disease might be altered in an unwanted direction, a problem that is being studied but as yet not substantiated by data. Secondly, there might be an increased risk of infectious complications, and then especially in small children. Chilcote et al. (1976) reported a high frequency of such complications (18 children out of 200) after laparotomy and splenectomy for Hodgkin's disease in childhood. Splenectomy is usually not recommended below the age of 5 (Berglund, 1976), but it may be noticed that of the children reported by Chilcote et al., only 3 were at most 5 years of age, and 9 were at least 10 years old. The results of staging laparotomy with splenectomy for Hodgkin's disease in childhood has been reported from Lund 1976 (Landberg et al.). There were 5 children of the ages 6, 12, 13, 14, and 15 years, respectively. In none of these children, who have been followed for mean 36 months, have any particular infections, attributable to removal of the spleen, been seen. Of the 91 patients in the present series, only one had had a postoperative suspicious sepsis judged from the temperature curve. However, blood culture was negative and the temperature normalized within ten days after oral penicillin treatment. The age of this patient was 50 years.

An analysis was made for each patient of whether the operation had contributed to the choice of therapy (Table VI). In 41% of the patients this was considered to be the case, and depended in 20% of the patients to a move to more advanced stage, in 11% to a move to less advanced stage and in 10% to a change in radiation port.

Since 1967 patients with presumed supradiaphragmatic Hodgkin's disease have been treated in Lund with radiotherapy of the supradiaphragmatic lymph nodes according to the mantle technique. The technique used has given a rate of local recurrence of only 3% (Svahn-Tapper et al., 1976). During the years 1967-1971, 42 patients were thus

treated for presumed supradiaphragmatic Stage I or II Hodgkin's disease without having been staged with a laparotomy (Baldetorp et al., 1976). These patients thus received no treatment of the abdomen. They have been followed for at least 3 years, and 31% of them have later had extensions of the disease to the abdomen. This figure agrees well with that for detection of occult abdominal involvement in Hodgkin's disease found at laparotomy. Therefore it seems that such occult abdominal disease sooner or later will become symptomatic. It is not clear whether the prognosis is impaired by waiting to treat the abdominal manifestations until they become symptomatic, though this is most likely the case.

The value of a staging laparotomy depends on how representative the tissue sampling is. Out of the 91 patients in the present series those who had only supradiaphragmatic disease and in whom the laparotomy was part of their pretreatment evaluation were treated with the mantle technique in the same way as during the period 1967-1971. As of this date 24 patients have been followed for more than one year. Of these, 3 have relapsed, namely one after 2 years in generalized disease, one after 1 year in the lung parenchyma, and one after 1 year in paraortic lymph nodes. In the latter patient it had not been possible to sample representative lymph nodes at laparotomy. Twenty-one of the 24 patients are thus without evidence of disease. Four of them have been followed for 1-2 years, 5 for 2-3 years, 5 for 3-4 years, 5 for 4-5 years, and 2 for more than 5 years. It may be mentioned that in the 1967-1971 non-laparotomized series the abdominal relapses were diagnosed after median 20 months, and within 3 years in 11 out of 14 patients. In the present series, so far, sampling error has thus not been a major problem.

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