

SCALENE NODE BIOPSY\*

R. L. AIKENS, M.D., F.R.C.P.[C],†  
Halifax, N.S.

THE METHOD of biopsy commonly known as scalene node biopsy has now been in use for about 10 years. Since Daniels<sup>2</sup> published the first report of its use in 1949, many publications have appeared from all parts of the world. The present paper describes our experience with the procedure in this particular locality.

Despite the many excellent diagnostic methods at our disposal, we are very conscious of the difficulty in arriving at an accurate diagnosis in many patients with lung disease. Histological material representing the pathological process in the lungs may sometimes be obtained by removing the lymph nodes which lie in the fat bed anterior to the scalenus anticus muscle. A diagnostic thoracotomy may therefore be made unnecessary.

The scheme of lymphatic drainage of the lungs and mediastinum described by Rouvière is generally accepted. The entire right lung drains to the right scalene nodes, and the left upper lobe drains to the left scalene nodes. The left lower lobe drains to the right scalene nodes, whereas the left midlung region may drain to either side.

The anatomy and the surgical technique involved in scalene node biopsy are well documented in various publications. The incision is made over the lateral border of the sternomastoid muscle parallel to and just above the clavicle. Overlying the scalenus anticus muscle is a space filled with fat, containing several small lymph nodes and bounded below by the subclavian vein, medially by the internal jugular vein and laterally by the omohyoid muscle. Some operators, particularly Harken,<sup>3</sup> have followed the veins down into the upper mediastinum and by thus extending the biopsy have been able to obtain additional lymph nodes for study.

The present series consists of 100 patients on whom scalene node biopsy was done from 1951 to 1958 inclusive. Care has been taken to exclude all cases where palpable cervical lymph nodes were present. It will be noted that this is the concept which Daniels set forth in his original publication. Various subsequent reports have been based on

TABLE I.—RESULTS OF SCALENE NODE BIOPSY

	No. of cases
1. Specific diagnosis . . . . .	27
2. Non-specific findings (e.g. sinus catarrh, chronic inflammation) . . . . .	28
3. Normal lymph nodes . . . . .	30
4. No lymphatic tissue . . . . .	15
Total . . . . .	100

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†Assistant professor of medicine, Dalhousie University, Halifax, N.S.

TABLE II.—SPECIFIC DIAGNOSIS

Diagnosis	No. of cases
Sarcoidosis . . . . .	15
Carcinoma (secondary from lung) . . . . .	8
Carcinoma (secondary from breast) . . . . .	1
Reticulum cell sarcoma . . . . .	1
Tuberculosis . . . . .	1
Silicosis . . . . .	1
Total . . . . .	27

different criteria and have included cases with palpable lymph nodes.

Mediastinal extension of the biopsy was not carried out in our group. Most biopsies were performed on the same side of the neck as the intrathoracic lesion. However, in a few cases of left lower lobe disease, a right scalene biopsy was carried out. Biopsy was bilateral in only one patient. The biopsies were performed by operators with varying degrees of experience, mostly members of the resident staff. Schiff and Warren<sup>5</sup> in their studies of autopsy material found that scalene lymph nodes show a remarkable diversity; in some cases large lymph nodes may be present, whereas in others lymphoid tissue may be scanty or even absent. However, the fact that no lymphatic tissue was found in 15 of our cases may well have been due in some instances to inexperience of the surgeon in the procedure.

TABLE III.—DIAGNOSIS OF CASES IN WHICH BIOPSY WAS DONE

Diagnosis	No. of cases	Made by scalene biopsy	Made by histological findings from other site	Made by clinical, x-ray or lab. findings
Carcinoma of lung . . . . .	35	8	16	11
Sarcoidosis . . . . .	22	15	1	6
Pulmonary fibrosis . . . . .	7	0	0	7
Chronic pneumonitis . . . . .	5	0	0	5
Pulmonary tuberculosis . . . . .	4	1	0	3
Silicosis . . . . .	2	1	0	1
Carcinoma of lung (secondary from breast) . . . . .	2	1	0	1
Reticulum cell sarcoma . . . . .	1	1	0	0
Miscellaneous conditions—lungs and abdomen . . . . .	22	0	5	17
Total . . . . .	100	27	22	51

The 100 patients included in the present study ranged in age from 18 to 79 years. There were 72 males and 28 females, but this sex difference has been influenced by the fact that 24 of the patients were inpatients in Camp Hill Veterans Hospital and were males. The findings fell into four main groups: (1) *specific diagnosis*, in which the examination of the scalene node made the diagnosis or in certain cases of carcinoma of the lung may only have confirmed that the disease had spread; (2) *non-specific findings*, described by the pathologist as showing various lesions such as sinus catarrh or chronic inflammation (we have been unable to attach any significance to this finding); (3) *normal lymph nodes*; (4) *absence of lymphatic tissue*.

The results are shown in Tables I and II.

Table III shows the distribution of cases, with the number diagnosed by scalene node biopsy alone, those with a histological diagnosis made by

other means, and those in which the diagnosis was made by clinical, x-ray or laboratory investigation.

#### DISCUSSION

Scalene node biopsy may be carried out for two main reasons: (1) as a diagnostic measure; this is its prime importance; (2) to show whether a carcinoma of the lung has spread to the regional lymph nodes and therefore may be considered inoperable. Delarue<sup>2</sup> points out that in a group of cases of bronchogenic carcinoma, 12 were considered to be operable so far as evidence of extension was shown by examination of the scalene node, but at the time of thoracotomy eight were found to have mediastinal extension that made resection impossible. It would therefore seem that this biopsy procedure is valuable in carcinoma of the lung, firstly as a diagnostic procedure and secondly as an index not of operability but of inoperability.

With respect to its value as a diagnostic procedure, the present report confirms those of other investigators that it yields the best results in sarcoidosis. It is of some value in diagnosis of carcinoma of the lung, although the condition is usually strongly suspect and other diagnostic information may be obtained by bronchoscopic and cytological examination of the lung secretions. It has not proved to be of any value in our hands in the diagnosis of pulmonary fibrosis. In pulmonary tuberculosis, we have used it very infrequently and although it may occasionally have some value, this diagnosis is usually made more readily by other means. A word of caution should be given, in that occasionally the histological picture of the scalene node may not represent the disease actually present in the lung. Schwippert and Macmanus<sup>6</sup> report a case in which tuberculosis was diagnosed from a scalene biopsy specimen when in fact the patient was suffering from a malignant pulmonary tumour. Ten Seldam<sup>7</sup> has also reported sarcoid-like lesions in lymph nodes draining a carcinoma.

#### SUMMARY

One hundred cases in which scalene lymph node biopsy was performed between 1951 and 1958 inclusive have been reviewed. Cases with palpable cervical lymph nodes were not included in the one hundred. In 27 cases (27%), the method gave a specific diagnosis. There were 22 cases with the clinical features of pulmonary sarcoidosis, and scalene node biopsy confirmed this diagnosis in 15.

There were 35 cases of primary carcinoma of the lung, and scalene node biopsy was positive in eight of these.

Since no lymphoid tissue was found in 15% of the cases, we feel that at least in some of these the fat pad removal must have been inadequate. We agree with other observers that this procedure should not be undertaken too lightly, and that it is better to have it carried out by a few operators in any one institution, so that they may gain more experience and be successful more often.

#### REFERENCES

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42 Bellevue Avenue,  
Halifax, N.S.

#### RÉSUMÉ

L'analyse d'une série de biopsies pré-scaléniques pratiquées de 1951 à 1958 chez cent malades a montré qu'on était arrivé à un diagnostic précis dans 27% des cas. Cette série ne comportait aucun malade présentant des ganglions cervicaux palpables. Quinze des 22 malades offrant un tableau clinique de sarcoidose pulmonaire reçurent la confirmation du diagnostic par cette technique de biopsie, qui confirma également dans 8 cas sur 35 la présence de cancer chez des malades atteints de carcinome primaire du poumon. On ne put trouver à l'examen histologique de tissu lymphoïde dans 15% des prélèvements; il semble donc que dans un certain nombre de cas l'exploration de la graisse pré-scalénique n'a pas dû être satisfaisante. Comme l'ont déjà fait remarquer d'autres auteurs, ce procédé ne doit pas être entrepris à la légère. Il sera même préférable dans chaque institution de le laisser entre les mains de quelques opérateurs qui pourraient à la longue acquérir assez d'expérience pour augmenter l'efficacité de l'intervention.

#### ACUTE NON-OBSTRUCTIVE PYELONEPHRITIS

Although the pathological changes in chronic pyelonephritis constitute a frequent necropsy finding, it is not often that such cases have a history to suggest the previous presence of an infection of the urinary tract. It has been suggested that chronic pyelonephritis results from a sub-clinical infection that persists after an acute infection of the urinary tract, but the statistical relationships between the acute and chronic processes are in great measure unknown. It was considered useful to carry out a consecutive study in patients treated for acute pyelonephritis with the objective of determining whether or not significant grades of bacteriuria persisted after apparent recovery from the acute illness.

The study included 30 patients treated for acute pyelonephritis in a large hospital between the years 1952 and 1957. All were women between the ages of 17 and 38 years. None had any major sequelæ after the acute initial episode. Midstream specimens of urine were obtained and quantitative urinary cultures were performed. The finding of 100,000 bacteria per ml. or more was considered to indicate persistent infection of the urinary tract.

Of the subjects 27 reported no history of recurrence of symptoms after the acute initial episode. All had been treated by comparable forms of therapy, in that all had received antibiotics alone or in combination for similar periods. The quantitative urinary cultures revealed indications of a persistent or recurrent infection in eight patients, including three who had noted minor urinary symptoms. *Escherichia coli* was the original causative agent cultured in six of the eight cases and members of the paracolony group were found in the other two. In six cases the organisms persisting were the same as those cultured during the acute episode. The duration of asymptomatic infection varied from two to 18 days after the acute original illness. In two cases the persistent bacteriuria subsided spontaneously, and in the others after treatment with antibiotics.

The results of this investigation indicate that an active infection of the urinary tract can persist, without producing symptoms, after an acute uncomplicated episode of pyelonephritis.—D. S. Dock and L. B. Guze: *Ann. Int. Med.*, 50: 936, 1959.