The size and histological appearances of mesenteric lymph nodes in Crohn's disease

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SUMMARY The size of the related lymph nodes and their histology has been correlated in 34 specimens of Crohn's disease.

Granulomata were shown not to affect the maximum diameter of the lymph nodes nor to be more frequent in large nodes. The enlargement of lymph nodes appeared to be due to simple, non-specific, reactive changes.

Granulomatous lymph nodes were found in 38% of all our cases of Crohn's disease and in 63% of those cases with granulomata in the bowel wall. One case was found with granulomata in the lymph nodes which were not seen in the bowel wall.

The mesenteric lymph nodes of 22 cases of ulcerative colitis were shown to be not significantly different in size from those of Crohn's disease.

The diameter of the lymph nodes on the histological section was shown to underestimate the diameter of nodes in the fresh state by a factor of 1.5.

Enlargement of mesenteric lymph nodes in Crohn's disease is a common finding and has been recorded by several authors, such as Rappaport, Burgoyne, and Smetana (1951), Warren and Sommers (1948), and Van Patter, Bagen, Dockerty, Feldman, Mayo, and Waugh (1954). Similarly sarcoid-like granulomata have been reported in a proportion of the mesenteric lymph nodes in this disease by these workers and by Williams (1964) and Morson (1968 and 1969). However, none of them have specified the number of nodes enlarged or the degree of enlargement nor have they stated whether nodal swelling indicated the presence of granulomata; indeed Van Patter *et al* (1954) suggested it did not, and Warren and Sommers had formed the impression that granulomata occurred mainly in 'medium sized' nodes.

This study of size and microscopical appearances in mesenteric lymph nodes has been undertaken in an attempt to elucidate these points and help the surgeon to decide on the probable extent of lymph nodal abnormality during operations for Crohn's disease.

Methods and Materials

In the year 1 May 1971 to 30 April 1972 56 bowel resections were performed for inflammatory bowel

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disease, and these comprised 34 cases of Crohn's disease and 22 of ulcerative colitis, diagnosed using the pathological criteria of Morson (1968 and 1971), Lennard-Jones, Lockhart-Mummery, and Morson (1968), and McGovern (1969).

These specimens were received in a fresh state, opened along the antimesenteric border and pinned out immediately before immersion in 15% formal saline solution. Detailed macroscopic examination of the specimen was made after two or three days and at this time the lymph nodes were sought. This was done in a systematic way by transversely slicing the now fairly firm mesenteric fat at 5 mm intervals along the full length of the specimen. Representative blocks were taken of all lymph nodes found and these were processed conventionally and stained with haematoxylin and eosin. The longest diameters of the lymph nodes were measured, using dividers, on the stained sections which were also examined microscopically.

Sixteen lymph nodes were treated in an identical way and the measurements of the maximum diameter made at successive stages of preparation, namely, when unfixed, fixed, processed, and sectioned.

Findings

Sixty-nine lymph nodes contained the sarcoid-like

	No. of Nodes	Maximum Diameter of Nodes (mm)				Percentage of Lymph Nodes with Diameter > 9mm
		Range	Mean	SD	SE	
Lymph nodes containing granulomata	69	2-13	5.85	2.35	0.28	8.7
Lymph nodes without granulomata	357	1-18	5.80	3.10	0.16	10.1

Table I Mesenteric lymph nodes in cases of Crohn's disease

granulomata of Crohn's disease, and to assess whether this feature was associated with an increase in size the mean maximum diameter of these nodes was compared with that of the uninvolved nodes (Table I).

The difference in the mean diameters is not significant, although the range seems to be narrower in the lymph nodes containing granulomata, which tends to contradict a common assumption that large lymph nodes in Crohn's disease are more likely to contain granulomata. This was also tested by comparing the histology of the lymph nodes above and below an arbitrary limit of 9mm maximum diameter (Table II) and by calculating the proportion of 'large' lymph nodes in those with and without granulomata (Table I, column 6).

	Total No.	No. Containing Granulomata
Crohn's lymph nodes > 9 mm diameter	42	6 (14.3%)
Crohn's lymph nodes < 9 mm diameter	384	63 (16.4%)

Table II Influence of the presence of granulomata in lymph nodes on their size

In neither instance is the difference significant, which confirms that large nodes do not contain an increased proportion of granulomata. Those large nodes free of granulomata either appeared normal

or showed oedema, sinus catarrh, follicular hyperplasia, or a combination of these features.

The examination of this series of specimens of Crohn's disease enabled an estimate of the frequency of lymph node involvement by the sarcoid-like granulomata to be made, not only in the series as a whole but also in the subgroups distinguished by the microscopical appearances of the bowel wall. These frequencies are given in Table III.

It is commonly stated that Crohn's mesenteric lymph nodes are enlarged and it is implied that largeness of nodes is a less marked feature in ulcerative colitis. This has been assessed here by including the 22 specimens of ulcerative colitis in the series (Table IV).

The difference in the mean maximum diameters is not significant, that is, $P > 0.2$.

It was suspected that histological processing might have caused the lymph nodes to shrink, and to assess this 16 nodes were measured at successive stages of the process. The mean maximum diameter of the lymph nodes in the fresh state was 10mm and the corresponding diameter when measured from the sections was 6.6mm, a ratio of 1.5.

Discussion

It is a reasonable, though unsubstantiated, hypothesis that the sarcoid-like granulomas represent the essence of established Crohn's disease and that the disease is capable of self-perpetuation and spreading

	No. of Cases	No. of Cases with Granulomata in Lymph Nodes	Percentage	Total No. of Nodes	No. Involved	Percentage
All Crohn's cases	34	13	38.2	426	69	16.4
Crohn's with bowel wall granulomata	19	12	63.1	248	62	25
Crohn's free of granulomata in bowel wall	15	1	6.6	178	7	3.9

Table III Incidence of granulomata in mesenteric lymph nodes

	No. of Cases	No. of Nodes	Largest Diameter of Nodes (mm)			
			Range	Mean	SD	SE
Crohn's disease	34	426	1-18	5.83	2.99	0.14
Ulcerative colitis	22	248	1-19	5.14	2.23	0.14

Table IV Mesenteric lymph nodes in ulcerative colitis and Crohn's disease

into the surrounding tissues, perhaps along lymphatic pathways. However, no worse prognosis has been associated with the presence of these granulomata (Antonius, Gump, Lattes, and Lepore, 1960; Morson, 1968). It is thus questionable whether it is more or less unfavourable for a patient with Crohn's disease to have granulomata or merely follicular hyperplasia and sinus catarrh in the lymph nodes. Nevertheless the hypothesis is plausible and popular and for this reason a more detailed study of mesenteric lymph nodes in this disease seems appropriate.

In spite of the statements of Van Patter (1954) and Warren and Sommers (1948) that the largest lymph nodes were not a particularly frequent site of granulomas these large lymph nodes are regarded and sometimes treated at operation as though the opposite were the case. In this series the mean maximum diameters of nodes with and without granulomata were very similar and the difference certainly was not significant. This did not rule out the possibility that the large lymph nodes were more frequently granulomatous so they were looked at again. The incidences of granulomata in 'large' and 'small' nodes were not significantly different. Also the granulomatous nodes had a range of diameters apparently narrower than the rest, the largest being 13mm as opposed to 18mm. There is thus no justification for suspecting the larger nodes of containing a greater proportion of granulomata or for making a wider resection to remove large nodes in the hope of removing more granulomata.

This series has revealed a higher proportion of cases of Crohn's disease with granulomatous lymph nodes than has previously been reported. Williams (1964) stated that 20% of cases of this disease contained granulomata in their lymph nodes, Warren and Sommers (1948) place the proportion of cases with 'involved' nodes at 30%, and Van Patter *et al* (1954) at 28%. These workers have not examined the lymph nodes in all their cases and do not claim to have attempted to find all the lymph nodes in cases where lymph nodes were examined. This may explain why granulomata have been found in 38% of all our cases of Crohn's disease and in 63% of those cases where the bowel wall showed granulomata. The uninvolved nodes were sometimes normal in appearance and the rest showed oedema, sinus catarrh, and follicular hyperplasia, and it is these non-specific reactive changes which cause node enlargement.

One case was seen which, though free of granulomata in the bowel wall, nevertheless contained many in the lymph nodes (Table III). This occurrence has been previously reported in two cases by Hadfield (1939) but has been denied by Crohn (1934) and

Morson (1971), Schapiro (1934), and Tandon and Prakash (1972).

Although the lymph nodes of Crohn's disease have been thought to be more prominent than those of ulcerative colitis no significant difference could be found between the two groups in this series. One must assume that the lymph nodes of ulcerative colitis are equally prone to enlargement and perhaps the degree of enlargement of both groups should be more objectively established by comparison with a 'normal' group probably obtainable from necropsy series.

The ratio of the unfixed diameter to that of the sectioned node is an indication of the degree of shrinkage caused by the histological processing. The figures quoted for the diameters of lymph nodes in our specimens should be increased by a factor of 1.5 to correspond more accurately with the size of the nodes in the fresh state or at operation.

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