Laparoscopic retroperitoneal/mesenteric lymph node sampling: a safe and effective technique
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ABSTRACT

Introduction: Needle aspiration and core biopsies are commonly used to assess retroperitoneal lymph nodes. However, the tissue obtained by this method is insufficient to define and type the tumour. This article demonstrates the feasibility and safety of the laparoscopic approach in obtaining an adequate volume of lymph node tissue for typing.

Methods: Laparoscopic retroperitoneal lymph node biopsy was performed on 12 patients over a period of five years. A pneumoperitoneum was induced with a Veress needle, and an initial 10-mm trocar was inserted in the sub-umbilical region in order to carry a 30-degree telescope. Two or more 5-mm ports were inserted into the targeted areas under laparoscopic guidance to achieve optimal triangulation in order to access the nodal tissue.

Results: The procedure was successful in 11 out of the 12 patients. An average volume of 1.7 cm³ of tissue was harvested for each patient. In one patient with preoperatively undiagnosed portal hypertension, laparoscopy was converted to an open procedure due to bleeding. In all patients, the histology was adequate and contributed to the diagnosis, allowing rapid institution of treatment. The diagnosis was reactive lymphadenopathy in three patients and sarcoidosis in one patient. Seven others suffered from various conditions, including lymphoma, leukaemia, secondary from unknown origin and Castleman’s disease.

Conclusion: Laparoscopy allows access to perihepatic and peri splenic areas, and is a choice of procedure when needle biopsy is not possible or fails to provide an adequate sample.

Keywords: laparoscopy, lymph node, lymphoma

INTRODUCTION

Laparoscopy is increasingly used for retroperitoneal lymph nodal dissection in urological and gynaecological malignancies.1-6 However, sampling or biopsy of retroperitoneal lymph nodes for various haematological and oncological conditions is rarely used. Instead, needle aspiration and core biopsies of retroperitoneal lymph nodes are commonly used. However, the tissue obtained by this route is insufficient to further define and type the tumour.5 The objective of this study was to assess the feasibility, safety and efficacy of the laparoscopic technique. Here, we share our views and experience of laparoscopic retroperitoneal/mesenteric lymph node biopsy performed for diagnostic reasons.

METHODS

In 2002–2009, we performed laparoscopic retroperitoneal lymph node biopsy on 12 patients at University Hospital Lewisham; all were performed as day case procedures. Most patients were referred by haematologists and physicians, and had already undergone computed tomography (CT) to identify the retroperitoneal disease, making it easier to target the appropriate nodes. All patients underwent ultrasonography (US) or CT-guided lymph node biopsy on the first instance. Histologically, the samples were insufficient and did not have a targeted tissue for the pathologist to confirm the pathology. Endoscopic US may be useful in obtaining targeted biopsy,8,9 but the volume of the specimens retrieved was inadequate with regard to typing and subotyping. Therefore, the patients were referred by the haematologists for a biopsy, specifying the volume of tissue to be obtained.

A standard laparoscopic technique was used in all cases. Pneumoperitoneum was induced with a Veress needle, and an initial 10-mm trocar was then inserted in the sub-umbilical region in order to carry a 30° telescope. Two or more 5-mm ports were inserted in the targeted areas under laparoscopic guidance to achieve optimal triangulation in order to access the nodal tissue. The small bowel, greater omentum and transverse colon were all shifted toward one side by tilting the operating
Table 1. Details of patients who underwent laparoscopy and retroperitoneal lymph node biopsy.

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Age (yrs); gender; symptoms</th>
<th>Lymph node biopsied</th>
<th>Histology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>74; F; Crohn’s disease on azathioprine, generally unwell</td>
<td>Coeliac (22 mm x 10 mm x 6 mm)</td>
<td>Reactive lymph node</td>
<td>CT image showed splenomegaly and numerous para-aortic lymphadenopathies</td>
</tr>
<tr>
<td>2</td>
<td>66; M; abdominal pain</td>
<td>Lymph node from lesser omentum and pre-aortic tissue (12 mm x 9 mm x 7 mm)</td>
<td>Pre-aortic tissue; fat, Lymph node; Castleman’s disease</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>75; F; abdominal pain</td>
<td>Coeliac (11 mm x 6 mm x 6 mm)</td>
<td>No evidence of metastases</td>
<td>Had a liver biopsy: granuloma</td>
</tr>
<tr>
<td>4</td>
<td>33; F; abdominal pain and weight loss</td>
<td>Mesenteric node (8 mm x 8 mm x 12 mm)</td>
<td>Follicular lymphoma grade I</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>31; F; mass right hypochondrium and splenomegaly and para-aortic nodes</td>
<td>Mesenteric node (18 mm x 3 mm x 13 mm)</td>
<td>Follicular lymphoma Grade 3 Stage IVa</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>59; F; mass right hypochondrium and splenomegaly</td>
<td>Mesenteric node (15 mm x 3 mm x 12 mm)</td>
<td>Diffuse large B cell lymphoma</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>64; M; splenomegaly</td>
<td>Para-aortic (22 mm x 20 mm x 14 mm)</td>
<td>Granulomatous lymphadenitis</td>
<td>Probable sarcoidosis</td>
</tr>
<tr>
<td>8</td>
<td>52; F; unwell</td>
<td>Coeliac node (13 mm x 12 mm x 12 mm)</td>
<td>Castleman’s disease</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>59; M; unwell</td>
<td>Porta hepatis nodes (17 mm x 10 mm x 8 mm)</td>
<td>Chronic lymphatic leukaemia</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>36; M; abdominal pain of unknown cause</td>
<td>Greater curve node (10 mm x 5 mm x 2 mm); lymph node (15 mm x 9 mm x 6 mm) and separate grey fragment (21 mm); lymph node (12 mm x 7 mm x 6 mm) with attached fatty tissue (15 mm); single lymph node (8 mm x 6 mm x 3 mm)</td>
<td>Metastatic tumour expressing epithelial markers</td>
<td>Metastatic tumour expressing epithelial markers, most probably poorly differentiated carcinoma; a non-seminomatous germ cell tumour cannot be excluded</td>
</tr>
<tr>
<td>11</td>
<td>72; M; abdominal pain</td>
<td>Tissue from abdominal mass (omentum) (25 mm x 20 mm x 10 mm); tissue from large bowel</td>
<td>Diffuse large B cell lymphoma</td>
<td></td>
</tr>
</tbody>
</table>

F: female; M: male; CT: computed tomography

The ‘head up’ position was mostly used. The coeliac lymph nodes were approached by dissecting through the lesser sac. Para-aortic nodes were reached by dissecting the posterior peritoneum left of the duodenojejunal flexure. Using instruments with bipolar attachments and laparoscopic Babcock forceps (Mediflex, Islandia, NY, USA) to steady the mass of nodes with minimum manipulation, the nodes were dissected and sampled. On average, a 25 mm x 25 mm mass of tissue was aimed for. Haemostasis was achieved with bipolar rather than monopolar diathermy due to the close proximity of the bowel loops. The 10-mm port site was closed with a 1-0 PDS® suture with a J needle (Ethicon, New Brunswick, NJ, USA) to the fascia. The skin and the remaining port sites were closed using skin glue. The tissue volume that was harvested was calculated in mm³ (volume = length x breadth x width), based on the histology report. If the width was not reported in the histology, then it was assumed that the width and breadth were equal for statistical calculations.

RESULTS

We attempted diagnostic laparoscopy and retroperitoneal/ mesenteric lymph node biopsy (RPLNB) in 12 patients, and the average volume of the tissue obtained was 1,798 (range 312–6,160) mm³. In one patient with undiagnosed portal hypertension, RPLNB was converted to an open procedure due to bleeding. RPLNB was successful in 11 out of the 12 patients (91.6%). The median operating time was 20 (range 23–45) minutes. All procedures were performed by a single laparoscopic surgeon. In all patients, the volume sampled was...
adequate and contributed to the diagnosis, allowing rapid institution of treatment. Histology of three patients demonstrated reactive lymphadenopathy. One suffered from granulomatous lymphadenitis, one from probable sarcoidosis and one was reported as reactive. The remaining seven patients with multiple retroperitoneal lymphadenopathies suffered from various conditions, including lymphoma, leukaemia, secondary from unknown origin and Castleman’s disease. Apart from one patient requiring conversion to open, we did not have any complications in our series.

Table I summarises the results in detail. Figs. 1 & 2 show the CT images of the abdomen before and after chemotherapy in patients diagnosed with lymphomas, based upon laparoscopic nodal biopsies. Fig. 3 shows the laparoscopic view of a coeliac lymph node biopsy, while Fig. 4 summarises the results of various pathologies.

DISCUSSION
Retroperitoneal lymphadenopathy occurs in various conditions, including haematological malignancies,
secondary tumours of testes, ovaries and cervix, infections such as tuberculosis and retrovirial disease and sarcoidosis. CT is the most useful imaging modality for assessment of the retroperitoneal space, and may identify other pathologies involving organs such as the spleen, liver, pancreas, kidneys and intestines. It may also help the surgeon to focus on a particular nodal group during laparoscopy. CT- or US-guided needle sampling is often performed under radiography control for obtaining nodal tissues from retroperitoneal disease. The limited amount of material obtained though this method may not be adequate for a proper tissue diagnosis. It is often insufficient for detailed typing in lymphomas to determine the most appropriate chemotherapeutic regimen. Trephine biopsies of bone marrows may not show the disease until it has been involved.

When radiological and marrow biopsies fail to contribute to the diagnosis, laparotomy or laparoscopy is done to obtain a retroperitoneal node biopsy and biopsies of other diseased intra-abdominal organs. Laparotomy may help to reach a diagnosis, but may often delay the starting of chemotherapy by a few weeks, as healing of the large abdominal wall wound slows down if chemotherapy is started early. The advantages of laparoscopy and biopsy of retroperitoneal lymph nodes are numerous. Firstly, one can visualise the entire peritoneal cavity as well as organs such as the liver, spleen and intestines. Secondly, any suspicious areas on these organs can be biopsied, and thirdly, an adequate volume of biopsy specimens can be taken so that the lymphoma can be subtyped. Since this is a minimally invasive technique, the small wound heals quickly, allowing therapeutic chemotherapy to start as soon as possible. The reduction in diagnostic delay allows the cancer targets to be met and the institution of appropriate treatment within 62 days. Laparotomy or laparoscopy may also provide staging of infra-diaphragmatic Hodgkin’s lymphoma. However, with the advent of CT, laparoscopy is no longer performed for staging. Although there are occasional reports of development of lymphocele after RPLNB, we did not come across any such complications.

The published literature on retroperitoneal lymph node biopsy in retroperitoneal lymphadenopathy is limited. According to a large published retrospective study conducted at the Mayo clinic on 94 patients who underwent laparoscopy, the success rate of obtaining a tissue sample was 83%. Adhesions, bleeding and poor intraoperative exposure resulted in conversion to an open procedure in the remaining patients. The rate of obtaining false negative results from laparoscopic biopsy was 6%. Another study from the Cleveland Clinic found that four out of 30 patients required conversion to open procedure. In a small retrospective study from Italy, laparoscopy was successful in providing enough samples in 94% of the 18 patients, with no conversion to open procedure. Laparoscopic lymph node biopsy would enable quick patient recovery and could also help to avoid laparotomy.

Four of our patients who suffered from lymphoma and one patient with chronic lymphatic leukaemia were referred to the regional haematology unit for appropriate chemotherapy. The patient with metastases to the spleen and liver, and sarcoidosis. Infections such as the liver, spleen and intestines.

REFERENCES
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