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AIMS AND SCOPE

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Case Control Study

Laparoscopic dissection of the hepatic node: The trans lesser omentum approach

Offir Ben-Ishay

ORCID number: Offir Ben-Ishay (0000-0003-3603-3843).**Author contributions:** Ben-Ishay O designed, drafted, and critically reviewed the manuscript.**Institutional review board****statement:** The study was approved by the institutional review board of the Rambam Health Care Campus, Haifa, Israel.**Informed consent statement:**

Informed consent was exempt by the institutional review board due to the retrospective nature of the study and no impact on the clinical outcome of the study.

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Diagnosis of lympho-proliferative diseases is sometimes challenging. Excisional lymph node biopsy is the standard of care. Five percent of the patients will present with abdominal or retroperitoneal lymphadenopathy alone. Advancements in endoscopic techniques allow for access to fine needle biopsy in complicated areas, but this often does not meet the standard guidelines for diagnosis.

AIM

To investigate the results of laparoscopic excisional biopsy of the hepatic node (LEBHN) through a trans lesser omentum approach.

METHODS

Data of all patients undergoing LEBHN were collected retrospectively from patients' electronic charts over a period of 1 year. Data collected included age, gender, suspected disease, number of previous biopsies and biopsy method, surgical approach, intraoperative complications, operative time, post-operative complications, mortality, and final diagnosis.

RESULTS

Six patients were operated in this technique during the time frame of the study, 66.6% ($n = 4$) were females, and median age was 55 years (range: 25-72 years). We present no conversions from laparoscopy to laparotomy, and mean operating time was 51.2 min. Mean length of hospital stay was 1 d, and morbidity and mortality were nil. Most importantly, this technique offered definite diagnosis and appropriate treatment in all patients. Final diagnosis included two patients with lymphoma (Hodgkin and Follicular), two patients with sarcoidosis, and two patients with reactive lymph nodes with no evidence of malignancy.

CONCLUSION

In conclusion, this technique seems to be feasible and safe and may offer a simple

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approach for a definite diagnosis for what seems to be a complicated anatomical area.

Key words: Lymph node; Diagnosis; Lymphoma; Laparoscopy; Biopsy; Retroperitoneum

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Core tip: Diagnosis of lympho-proliferative diseases is sometimes challenging, and laparoscopy is an essential tool. Laparoscopic excisional biopsy of the hepatic node seems to be feasible and safe and may offer a simple approach for a definite diagnosis for what seems to be a complicated anatomical area.

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INTRODUCTION

Diagnosis of lympho-proliferative diseases is sometimes challenging. Based upon the current international guidelines^[1,2], a surgically excised tissue biopsy is widely accepted as the gold standard for the diagnosis of lymphoma. An excisional biopsy of a lymph node (LN) allows assessment of the micro-architecture and provides adequate material for immunocytochemistry, flow cytometry, fluorescence *in situ* hybridization studies, and extraction of DNA and RNA for molecular diagnostics. The major disadvantages of surgical biopsies are the probable need for general anesthesia and deferrals due to the need of a surgical consult and operating room time. These issues are addressed through percutaneous and endoscopic core needle biopsies or fine needle aspiration with cellblock techniques.

When possible, a superficial LN, most often from the groin or axilla, should be excised, and this can be done simply under local anesthesia in day care setup. Often though this is not possible, and an intra-abdominal LN must be obtained.

The intra-abdominal lymphatic system is complex, and lymphadenopathy is often retroperitoneal, along the celiac axis and in the pelvis. Traditionally, laparoscopic biopsies of retroperitoneal or celiac nodes are considered complicated. Lymph nodes that are distributed along the celiac trunk include the root of the left gastric (station 7), the proper hepatic artery (station 8), and the splenic artery (station 9).

The hepatic node is the lymph node lying on the proper hepatic artery right above the neck of the pancreas. This node is quite often enlarged and has an abnormal fluorodeoxyglucose uptake on positron emission tomography (Figure 1).

Approach to the supra-pancreatic area is complex; the current study presents our experience with six patients who underwent laparoscopic excision of the hepatic node (LEBHN) through a trans lesser omentum approach.

MATERIALS AND METHODS

Surgical technique

After general anesthesia was induced, the patient was placed in a lithotomy position, and the operating table was maintained in 20° into the reverse Trendelenburg position. The surgeon was located between the legs of the patient, while the first assistant and the camera operator were placed to the left and the right side of the patient respectively.

After insufflation of the abdomen with CO₂ through a veres needle, a 10 mm trocar was placed above the umbilicus. The camera was then inserted, and an exploration of the abdomen was performed. A second 10 mm trocar was placed in mid left abdomen, and three 5 mm trocars were placed sub-xifoide, mid right quadrant, and left upper quadrant.

The left lobe of the liver was retracted upwards towards the diaphragm, and the lesser omentum with its pars flaccida was exposed. The pars flaccida was excised, the supra-pancreatic area was exposed, and the hepatic node was then observed (Figure

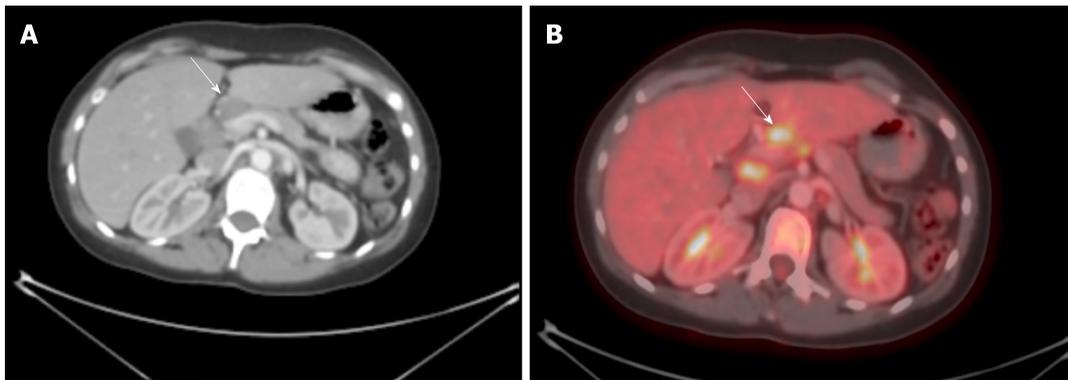


Figure 1 Abnormal FDG uptake on positron emission tomography. A: Computed tomography scan of the abdomen showing enlarged hepatic LN; B: Positron emission tomography showing abnormal FDG uptake in the same LN. FDG: Fluorodeoxyglucose; LN: Lymph node.

2A). The peritoneal layer above the hepatic node was carefully dissected with an electric cauter, and the node was then dissected carefully with bipolar energy (Figure 2B).

Data collection

Data of all patients undergoing LEBHN over a period of 1 year were collected retrospectively within the array of the surgical oncology service of the Department of general surgery at the Rambam Health Care Campus. Data included demographics, preoperative data including number of previous biopsies, previous biopsy methods used, and operative and post-operative data. Operative and postoperative complications were recorded.

RESULTS

Six patients were operated in this technique during the time frame of the study, 66.6% ($n = 4$) were females, and the median age was 55 years (25-72). Two patients had a suspected recurrence of a previously treated lymphoma. Three patients had one previous attempt for tissue diagnosis, and one had three of them. One patient had percutaneous attempt for biopsy, four had endoscopic biopsies through endoscopic ultrasound, and one patient had a mediastinoscopy with mediastinal biopsy. Table 1 depicts the demographic operative and post-operative characteristics of the entire cohort. All patients were operated in a laparoscopic approach with no conversions to laparotomy. All patients had an uneventful operation with no operative or post-operative complications. Mean length of hospital stay was 1 d, and morbidity and mortality were nil.

DISCUSSION

Retroperitoneal lymphadenopathy occurs in various hematologic and granulomatous diseases. Approximately 5% of patients will have abdominal lymphadenopathy without enlargement of LN in superficial areas^[4]. Advancements in percutaneous and endoscopic techniques allow diagnosis through minor ambulatory procedures. Laparoscopic abdominal and retroperitoneal lymph node biopsy was previously proven to be feasible and safe in the diagnosis of lympho-proliferative diseases^[3-13]. Biopsy of celiac nodes or hepatic nodes though has been described occasionally in the literature. The current study describes six patients that underwent a laparoscopic celiac node biopsy in a trans lesser omentum approach. The advantages of this technique over other endoscopic approaches are the high chances for a definitive diagnosis, a better diagnostic yield, and early instigation of treatment.

The approach to the supra-pancreatic area is possible through dissection of the gastro-colic ligament and entrance to the lesser sac, this technique allows full exposure of the pancreas, splenic artery, and hepatic artery. Pisano *et al*^[4] used this approach in four cases. This technique carried some disadvantages as mobilization of the large curvature of the stomach increases the rate of complications, such as intraoperative hemorrhage and injury to the stomach, and significant increases the operating time.

In our small case series, there were no conversions to laparotomy. The outcomes of

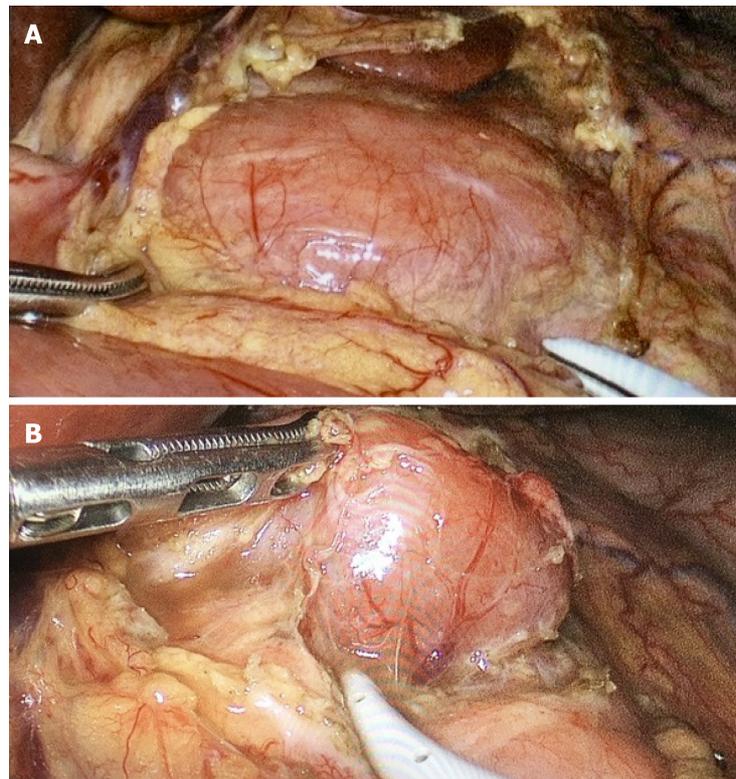


Figure 2 The left lobe of the liver is retracted upwards towards the diaphragm and the lesser omentum with its pars flaccida is exposed. A: Exposure of the hepatic node excising the lesser omentum; B: Dissection of the hepatic node.

operative time, blood loss, and complications were acceptable. All patients received an accurate diagnosis without any false-negative results.

Although the results of this current patient series are good, the small sample size does not permit firm conclusions.

In conclusion, LEBHN seems to be feasible and safe, and surgeons may use this simple approach to a fairly complicated anatomical area to patients who do not have access to superficial lymph nodes.

Table 1 Patients' demographic and operative characteristics

Age	Gender	No of Biopsies	FNA	FNB	ORT	LOS	Complications	Diagnosis
72	F	1	Yes	No	71	1	No	Follicular LY
39	F	1	No	No	53	1	No	Hodgkin LY
25	M	0	No	No	49	1	No	Sarcoidosis
60	F	0	No	No	65	1	No	Reactive LN
69	F	3	Yes	Yes	47	1	No	Sarcoidosis
51	M	1	No	No	22	1	No	Reactive LN

F: Female; M: Male; FNA: Fine needle aspiration; FNB: Fine needle biopsy; ORT: Operating time; LOS: Length of hospital stay; LY: Lymphoma.

ARTICLE HIGHLIGHTS

Research background

Diagnosis of lympho-proliferative diseases is challenging. Although an excisional biopsy of a complete lymph node is the gold standard for diagnosis, endoscopic or percutaneous techniques are often used due to the surgical challenge the location of the lymph node imposes.

Research motivation

The current study describes a small case series of laparoscopic dissection of the hepatic node through a trans lesser omentum approach. This approach is rarely discussed in the English literature.

Research objectives

The study describes the clinical and surgical results of this novel technique.

Research methods

A single center, retrospective evaluation of patients undergoing laparoscopic dissection and excisional biopsy of the hepatic node.

Research results

During the time frame of the study, six patients were operated using this novel technique, with no conversions to laparotomy, no intra and post-operative complications and acceptable operating time. Most importantly, surgery yielded a definite diagnosis in all patients, and there was no need for further investigation.

Research conclusions

Laparoscopic dissection of the hepatic node seems to be feasible and safe, and surgeons may use this simple approach to a fairly complicated anatomical area in highly selected patients who do not have access to superficial lymph nodes.

Research perspectives

This study suggests that approach to the hepatic node and the celiac axis is easily and safely performed through a trans lesser omentum approach. This may facilitate future discussion on how to achieve the diagnosis of lympho-proliferative disease in patients who do not have enlarged and pathological superficial lymph nodes.

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