

Evaluating Diagnostic Excisional Biopsy for Cervical Lymphadenopathy: Complication Rates and Histopathological Findings in Baghdad Teaching Hospital

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ABSTRACT

Background: While needle biopsy is often used in the evaluation of lymphadenopathy, lymph node excision is frequently necessary, particularly for lymphoma diagnosis.

Lymph node excision is an invasive technique that has a possible risk of complications. However, there is limited research assessing the prevalence, types and factors associated with such complications.

Aim of Study: To identify the causes of cervical lymphadenopathy which need excisional biopsy. To identify whether the choice for local or general anesthesia will have any impact on complications.

Patients and methods: This is a prospective study that has been conducted at the 5th surgical unit of Baghdad Teaching Hospital/ Medical city. The data was collected from the 1st of March 2023 to the 1st of October 2024. A total number of 157 patients who were referred from the outpatient clinics or from the hematology department for cervical nodal excision. Patients basic characteristics were recorded (age, gender, BMI). Moreover, a thorough clinical history was taken regarding history of neck lump and previous malignancy, and the indication for excision.

Patients were sent for the following blood investigations and imaging. Patients were followed up for 1 week post operatively to detect any local complications and the biopsy result were obtained from histopathological lab by the researcher.

Results: Regarding final histopathological diagnosis; Hodgkins lymphoma was the most common (41.4%), followed by reactive lymphadenopathy (24.8%), TB (12.7%), and non-Hodgkin's lymphoma (6.4%). Among 157 patients, only 12 (7.6%) had complications. Regarding the type of complications, 7 (44.5%) had local swelling, 4 (2.5%) had local infection, and 1 (0.63%) had both local swelling and stitch sinus. No significant association was detected between the presence of complications and each of age, sex, BMI, neck level, and type of anesthesia.

Conclusion: The results of this study indicate that cervical lymph node excision is a low-risk procedure with a minimal incidence of complications. When complications do arise, they are typically of a minor nature. Local anesthesia was not associated with an increased risk of postoperative complications.

KEYWORDS: Cervical lymphadenopathy, lymph node excision, neck mass.

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INTRODUCTION

The head and neck region, containing vital structures, is a key area for lymphadenopathy, a clinical observation linked to infections, autoimmune diseases, and malignancy.¹

Multiple studies conducted in different nations have consistently shown that cervical lymph nodes have the most frequency of enlargement and biopsy among all peripheral lymph nodes.² In cases where a definitive diagnosis isn't possible, physicians must decide whether to wait or perform

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a lymph node biopsy, based on empirical evidence and patient concerns.³

Fine-needle aspiration (FNA) cytology is a widely used diagnostic tool for cervical lymphadenopathy, with reported accuracy rates varying across studies. The overall diagnostic accuracy of FNA for cervical lymphadenopathy generally ranges from 82% to 94.4%.⁴ Elastography is increasingly used for identifying and determining malignancy extent, serving a similar purpose as virtual biopsy in cases where fine-needle samples are inaccessible.⁵

Conventional diagnostic techniques like PET and computed tomography provide functional and anatomical data, but often expose patients to ionizing radiation, and diagnosis relies on clinical symptoms and findings.⁶

There are different types of biopsy, including:⁷

- **Fine needle aspirate (FNA)** A fine needle aspirate (FNA) is a diagnostic procedure used to extract fluid and tissue from lymphoma. It involves a slender, hollow needle, and a CT scan to identify the optimal site for the sample. While FNA can provide valuable information, it should not be the sole diagnostic tool, as additional examinations like excisional or incisional biopsy are necessary.
- **Core needle biopsy** A core needle biopsy involves extracting a small sample from a lymph node using a hollow needle. A local anesthetic is used to induce numbness, followed by cleansing and tissue extraction. The node's location is determined using palpation or ultrasound or CT scan.
- **Excisional biopsy** An excisional biopsy is a surgical procedure that removes a lymph node, requiring local or general anesthesia depending on the location.
This procedure is ideal for investigating lymph nodes, as it allows for sufficient tissue collection for diagnostic tests. The lymph node is then sent for analysis.
- **Incisional biopsy** An incisional biopsy is a surgical procedure that involves removing a portion of a lymph node due to significant swelling or clustering, similar to excision biopsy.

Cervical lymph node biopsy may be indicated in various clinical scenarios, including but not limited to:⁸

- Persistent or unexplained cervical lymphadenopathy (enlarged lymph nodes in the neck) lasting for more than 3-4 weeks.
- Suspicions of malignancy, such as metastatic carcinoma from the head and neck region.
- Evaluation of suspected lymphoma or other hematologic malignancies.
- Investigation of suspected tuberculosis or other infectious etiologies, especially in regions with a high prevalence of tuberculous lymphadenopathy.

- Assessment of inflammatory conditions affecting the lymph nodes.
- Confirmation of a suspected diagnosis when non-invasive tests like imaging or fine needle aspiration cytology are inconclusive.

Aim of Study

1. To identify the causes of cervical lymphadenopathy which need excisional biopsy.
2. To identify whether the choice for local or general anesthesia will have any impact on complications.

Patients and Methods

This study has been conducted at the 5th surgical ward of Baghdad Teaching Hospital/Medical city. The data was collected from the 1st of March 2023 to the 1st of October 2024.

A prospective design has been chosen for this study.

Inclusion criteria

All adult patients who underwent cervical lymph node biopsy were included in the study. The study included patients with lymphadenopathy of >1cm not responding to at least 1 month of treatment.

Any patients who is under 18 years old or missed to followed up was excluded.

Convenient sampling has been opted for this study as the population involved were patients who were referred from the outpatient clinics or from the hematology department for cervical nodal excision. Among 162 cases, 157 patients were selected, while 15 patients were excluded due to reasons mentioned in the exclusion criteria.

Verbal consent has been obtained from all participants before data collection.

A total number of 157 patients were included. Patients basic characteristics were recorded (age, gender, BMI). Moreover, a thorough clinical history was taken regarding history of neck lump and previous malignancy, and the indication for excision. Patients were sent for the following blood investigations: CBC and blood film, bleeding profile, biochemical tests, virology screen (HIV) & VDRL and imaging: CXR, neck U/S and CT scan of chest.

Lymph node biopsy was considered as indicated under following conditions:

- Lymph node size (more than 1 cm).
- Persistence for more than 1 month.
- Suspicious U/S findings: intranodal necrosis, reticulation, matting, peripheral vascularity, soft tissue edema.
- Recurrent LAP in hematological disorders.

Patients with indications for LN biopsy were evaluated for local versus general anesthesia according to the following criteria:

- Site & size of the LN: easily palpable lymph node in the posterior triangle amenable for local anesthesia

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while deep seated lymph nodes in the anterior triangle preferably under GA.

- Failure of proper sampling under local anesthesia may need general anesthesia.
- Patients unfit for GA, local anesthesia is indicated.
- Patient preference.

All lymph node excision procedures were done by the same surgeon, the procedure was as follows:

Incision: An incision was made over the lymph node parallel to Langerhans lines for cosmetic reason. The location and size of the incision depend on the lymph node's position and size.

Exposure: The overlying tissues, including skin, subcutaneous fat, and muscle, are carefully dissected to expose the lymph node. A Careful identification of vital structures, such as blood vessels, nerves, and salivary glands, was conducted in order to minimize injury.

Lymph Node Excision: The lymph node is gently dissected from surrounding tissues. The hilar vessels were ligated in order to control bleeding.

Closure: The incision is closed layer by layer, using absorbable sutures for deep tissues and non-absorbable sutures for skin closure. In patients with suspicion of TB, the wound was left open in order to allow drainage preventing pus collection.

Patients discharged in the same day of operation several hours later and they were followed up for 2 week post operatively to detect any local complications and the biopsy result were obtained from histopathological lab of Baghdad teaching hospital by the researcher.

Data entry was done using Microsoft Excel 2019. Data was recorded into different quantitative and qualitative variables for the purpose of analysis.

Analysis was done using statistical package for social sciences (SPSS version 26).

Data was summarized using measures of frequency (mean), dispersion (standard deviation), tables and graphs. A two-tailed p value of less than or equal to 0.05 was assigned as a criterion for declaring statistical significance.

RESULTS

A total number of 157 patients were included in the study sample.

The age distribution of the studied sample ranged from 22-71 years with a mean of 36.3 ± 12.4 SD. Regarding age group distribution, most patients were <40 years. Concerning sex, it showed male predominance as the male to female ratio was 1.4: 1. As for BMI, it ranged from 16.6-34.8 Kg/m² with a mean of 24.7 ± 6.8 SD; as shown in (Table 1).

Table (1): Basic characteristics of the studied sample.

Parameter		Frequency	Percent
Age (years)	< 40	105	66.9%
	40 - 60	41	26.1%
	> 60	11	7%
sex	Male	92	58.6%
	Female	65	41.4%
BMI (kg/m ²)	Underweight	15	9.6%
	Normal	67	42.7%
	Overweight	59	37.6%
	Obese	16	10.2%

All patients had a history of neck lump with most patients reporting a history of >2 months (43.3%). As for lymphadenopathy, 15 (9.6%) had single neck node, 62 (39.5%) had multiple unilateral neck nodes, 24 (15.3%) had bilateral neck nodes, and 56 (35.7%) had widespread

lymphadenopathy. As for history of previous malignancy, 18 (11.5%) had previous lymphoma, 2 (1.3%) had other malignancy, and 137 (87.3%) had none; as shown in (Table 2).

Table (2): Clinical characteristics of the studied sample.

Parameter		Frequency	percent
History of neck lump	>1 month	36	22.9%
	1-2 months	53	33.8%
	< 2 months	68	43.3%
Lymphadenopathy	Single neck node	15	9.6%
	Unilateral neck nodes	62	39.5%
	Bilateral neck nodes	24	15.3%
	Widespread lymphadenopathy	56	35.7%
Previous malignancy	Previous lymphoma	18	11.5%
	Other malignancy	2	1.3%
	None	137	87.3%

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Regarding the indication of excision; 102 (65.0%) had suspicion of lymphoma, 23 (14.6%) had suspicion of TB, and 32 (20.4%) had unclear lymphadenopathy. Concerning neck lymph node levels; 24 (15.3%) were of neck level I, 17

(10.8%) of level II, 8 (5.1%) of level III, 64 (40.8%) of level IV, and 44 (28.0%) of level V. As for the type of anesthesia; 146 (93.0%) had local anesthesia, and 11 (7.0%) had general anesthesia; as illustrated in (Table 3).

Table (3): Operative characteristics of the studied sample.

Parameter		Frequency	percent
Indication for excision	Suspicion of lymphoma	102	65%
	Suspicion of TB	23	14.6%
	Unclear lymphadenopathy	32	20.4%
Neck lymph node level	I	24	15.3%
	II	17	10.8%
	III	8	5.1%
	IV	64	40.8%
	V	44	28%
Type of anesthesia	Local	146	93%
	General	11	7%

Regarding final histopathological diagnosis; Hodgkins lymphoma was the most common (41.4%), followed by

reactive lymphadenopathy (24.8%), TB (12.7%), and non-Hodgkin's lymphoma (6.4%); as shown in (Table 4).

Table (4): Final histopathological diagnosis of the studied sample.

Parameter	Frequency	Percent
HL	65	41.4%
NHL	10	6.4%
Reactive lymphadenopathy	39	24.8%
Papillary thyroid Ca	4	2.5%
TB	20	12.7%
B lymphoma	6	3.8%
T lymphoma	2	1.3%
Toxoplasmosis	3	1.9%
Nasopharyngeal Ca	2	1.3%
Anaplastic large cell lymphoma	2	1.3%
Granuloma	2	1.3%
Atypical lymphoma	2	1.3%
Total	157	100%

Among 157 patients, only 12 (7.6%) had complications; as shown in figure (1). Regarding the type of complications, 7 (44.5%) had local swelling, 4 (2.5%) had local infection, and

1 (0.63%) had both local swelling and stitch sinus; as shown in (Table 5)



Figure (1): Complication rate of the studied sample.

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Table (5): Type of complications.

Type of complication	Frequency	Percent
Local swelling	7	5.1%
Local infection	4	2.5%
Local swelling and stitch sinus	1	0,63%

No significant association was detected between the presence of complications and each of age, sex, BMI, neck level, and type of anesthesia; as shown in table (6).

Table (6): Relationship between complications and other parameters.

Variable		Group		p-Value
		With complication	Without complication	
Age (years)	< 40	8	97	0.936
		66.7%	66.9%	
	40-60	3	38	
		25%	26.2%	
	> 60	1	10	
		8.3%	6.9%	
	Mean $\pm$ SD	36.7 $\pm$ 7.35	35.5 $\pm$ 8.73	
Sex	Male	8	84	0.762
		66.7%	57.9%	
	Female	4	61	
		33.3%	42.1%	
BMI (kg/m ²)	Underweight	1	14	0.958
		8.3%	9.7%	
	Normal	4	63	
		33.3%	43.4%	
	Overweight	5	54	
		41.7%	37.2%	
	Obese	2	14	
		16.7%	9.7%	
	Mean $\pm$ SD	24.6 $\pm$ 6.3	24.9 $\pm$ 7	
Neck level	Level I	2	22	0.923
		16.7%	15.2%	
	Level II	2	15	
		16.7%	10.3%	
	Level III	1	7	
		8.3%	4.8%	
	Level IV	4	60	
		33.3%	41.4%	
	Level V	3	41	
		25%	28.3%	
Type of Anesthesia	Local	10	136	0.2
		83.3%	93.8%	
	general	2	9	
		16.7%	6.2%	

DISCUSSION

The study included 157 patients, who showed a mean age of 36.3 years and male predominance. This aligns with Deka et al study which found that the mean age of those diagnosed with cervical lymphadenopathy was 40 years, with a higher proportion of males (70%) than females (30%).⁹ Dhua et al.

reported that the mean age of patients with cervical lymphadenopathy was 34 years and the study indicated a slight male predominance.¹⁰ Allareddy et al. noted that the mean age of the patients in their study was 59 years old, and a significant percentage of the patients (64.2%) were male.¹¹ The male predominance in our as well as other studies is

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expected because the most common diagnosis in these studies is found to be lymphoma and lymphoma happens to be more prevalent in men according to several investigations.¹²

In this study 28.7% of patients had enlarged cervical lymph nodes for more than 2 months duration, and 17.8% of them had the enlargement for 1-2 months. and according to Rehell et al, 48.0% of patients had the enlarged nodes for more than months and 33% had it for 2 weeks- 2 months duration.¹³ It makes sense that the majority of the cases underwent surgical excision after six weeks, as most benign illnesses are diagnosed and clinically resolved at this time, with the remaining instances undergoing more invasive diagnostic procedures.

About forty percent of cases had unilateral LN enlargement and 33% of them had generalized LN enlargement. And the most common involved level was level IV followed by V then II. According to Rehell et al, 39.6% if patients had unilateral LN enlargement and the most common affected nodes were located in level IV followed by level I and II.¹³ Allareddy et al also noticed that 81% of patients in their study had unilateral lymph node enlargement.¹¹

65% of the nodes in our study were excised for suspicion of lymphoma followed by unclear adenopathy and TB, the most common indication for excision in Rehell et al study was also lymphoma followed by unclear etiology¹³ this finding is reasonable because Accurate lymphoma diagnosis depends on the architecture of the involved node and cellular type of lymph nodes which cannot be always confirmed by CNB or FNA, so excision of the node is more common in suspected lymphoma cases, Studies indicate that surgical excision yields a greater diagnostic yield, with a full diagnostic ability of 95.2%, as opposed to 83.8% for CNB.¹⁴

We found that HL constituted 41% of the cases after final histopathological diagnoses followed by reactive lymphadenopathy 24.8%, TB 12.7 %, NHL 6.4%, metastasis from thyroid, nasopharynx and other primaries 3.8%, and other less frequent causes. Rehell et al found that the most common diagnosis in their study after LNE was found to be lymphoma followed by reactive changes and then TB.¹¹ On the other hand According to Bassiouni et al. Malignant disease was detected in 38.6% of cases (20% of which were lymphomas, while the remaining 18.5% were metastatic).¹⁵ Noteworthy is the fact that our analysis included fewer instances of nonspecific reactive lymphadenitis because most of them recover spontaneously and have a benign, self-limiting course.

We found a 7% complication rate following surgical removal of the cervical lymph nodes, 5% were localized swelling and 2% were localized infection. Sadly, there has been only few other researches done on this subject. Rehell et al.'s (2022) study, which included 321 patients who had LNE, revealed a 5.9% complication rate, with the majority of the complications (84.2%) falling into the mild (I–II) category on the Clavien–Dindo scale. The three hemorrhages that made

up the remaining 15.8% were considered serious conditions that needed intervention.¹³ According to Bassiouni et al., 4 patients (2.5%) experienced complications; cervical hematoma that affected two individuals was treated conservatively and went away, submandibular abscess necessitated surgical drainage in one patient, while another patient experienced temporary paralysis of the marginal mandibular nerve¹⁵. 9.5% of surgical LNE had complications as reported in the Allareddy et al research. Post-operative pneumonia (4.2%), hemorrhagic complications (3.5%), other infections (1.7%), cardiac problems (1.5%), bacterial infections (1.5%), respiratory difficulties (1.4%), non-healing wounds (1.3%), septicemia (1.2%), and mycoses (1.2%) were among the complications that were commonly seen.¹¹

The initial indication for LNE was mainly to rule out lymphoma. The diagnosis could have been initially attempted by using other less invasive techniques like ultrasound guided FNA and CN. a study found that FNA has demonstrated good sensitivity (95.5%) and specificity (98.7%) for diagnosing lymphomas, making it a dependable initial diagnostic tool.¹⁶ another study found that FNA has reached an overall accuracy of 94.8% in evaluating tiny cervical lymph nodes.¹⁷ A research focused on the value of using CNB for detecting cervical lymph nodes lymphoma instead of LNE, found that in 92.3% of the lymphoma patients, complete sub classification of the illness with timely initiation of therapy was achievable.¹⁸ As a result, even though we are unable to offer conclusive evidence, it would appear plausible to presume that, for a subset of the patients in our study, CNB (cervical node biopsy) or FNA performed under US guidance alone may have been adequate to diagnose lymphoma and the complications of LNE could have been avoided. Nonetheless, LNE continues to be the suggested diagnostic technique for lymphoma indefinitely because FNAB/CNB is unable to provide a conclusive diagnosis in 25% of patients.¹³

It is noteworthy to highlight that the choice of anesthesia (general vs. local) was not linked to the incidence of any complication. A similar finding was reported by Rehell et al.¹³ This indicates the safety and efficacy of local anesthesia in the procedure of cervical lymph node excision.

CONCLUSION

The results of this study indicate that cervical lymph node excision is a low-risk procedure with a minimal incidence of complications. When complications do arise, they are typically of a minor nature. Local anesthesia was not associated with an increased risk of postoperative complications.

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