

# Effect of Lymph Node Processing Technique in Neck Dissection Lymph Node Yield

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## Background

- Regional lymph node (LN) spread is important predictor of locoregional recurrence and overall survival.
- LN yield affects prognosis and is an important quality metric for neck dissections.
- Accurate identification and pathologic assessment of all the dissected lymph nodes remains difficult with no established nor standardized grossing technique utilized by surgical pathology staff.

## Objective

- Does lymph node processing technique affect overall lymph node yield?
- Does technique affect the overall positive lymph node yield and patient outcomes?

## Methods

|                       |                                                                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Design                | <ul style="list-style-type: none"><li>Cross-sectional analysis of a retrospective cohort study</li></ul>                                                                                           |
| Participants          | <ul style="list-style-type: none"><li>432 patients who underwent neck dissection for head and neck cancer at Johns Hopkins Hospital</li><li>Age ≥ 18 years</li><li>Enrollment: 2015-2018</li></ul> |
| Processing Techniques | <ul style="list-style-type: none"><li>1: Lymph Nodes alone</li><li>2: Lymph Nodes + Part of Surrounding Tissue</li><li>3: Lymph Nodes + All Surrounding Tissue</li></ul>                           |
| Outcomes              | <ul style="list-style-type: none"><li>Primary: Lymph Node Yield</li><li>Secondary: Node Positivity, Recurrence, Survival</li></ul>                                                                 |
| Analyses              | <ul style="list-style-type: none"><li>Student's t-test to compare node yield and node positivity</li><li>Logistic regression to assess composite outcomes by technique</li></ul>                   |

Table 1 – Total Lymph Nodes Identified by Technique

| Technique 1 vs. 2 | Mean LN Yield (SD) |                     |         |
|-------------------|--------------------|---------------------|---------|
|                   | LN Alone           | LN + Part of Tissue | p-Value |
|                   | 28.0 (12.0)        | 27.0 (13.8)         | 0.574   |
| Technique 2 vs. 3 | LN+Part of Tissue  | LN + All Tissue     | p-Value |
|                   | 27.0 (13.8)        | 31.7 (15.0)         | 0.035   |
| Technique 1 vs. 3 | LN Alone           | LN + All Tissue     | p-Value |
|                   | 28.0 (12.0)        | 31.7 (15.0)         | 0.006   |

Figure – Frequency of Different LN Identification Techniques Used in Each Selective Neck Dissection

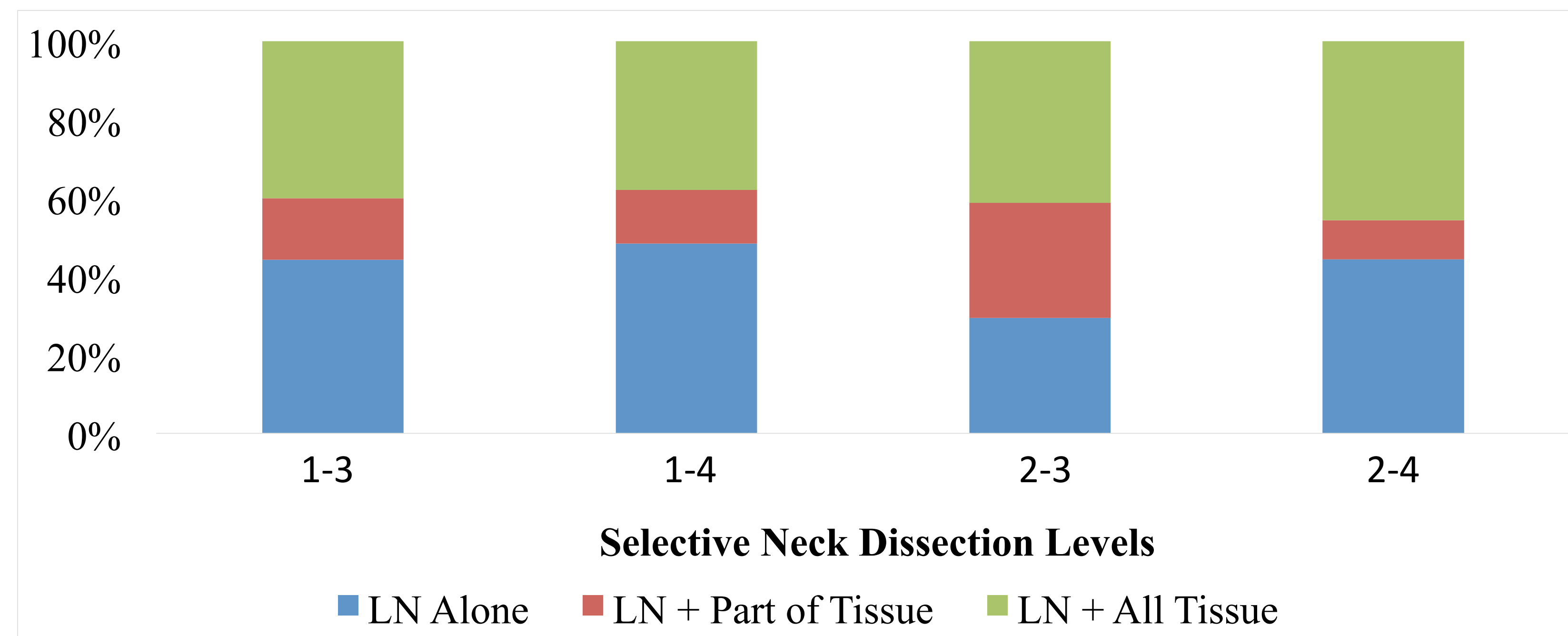


Table 2 – Comparison of Techniques 1 and 3 on LN Yield and Positivity by Selective Neck Dissection

|              | Mean LN Yield (SD) |             |         | Mean Positive Nodes (SD) |             |         |
|--------------|--------------------|-------------|---------|--------------------------|-------------|---------|
|              | Technique 1        | Technique 3 | p-Value | Technique 1              | Technique 3 | p-Value |
| Level 1 to 3 | 22.7 (8.8)         | 33.1 (14.1) | 0.001   | 1.1 (1.9)                | 0.6 (1.4)   | 0.269   |
| Level 1 to 4 | 29.0 (10.7)        | 36.9 (14.9) | 0.007   | 1.3 (2.4)                | 1.0 (1.3)   | 0.595   |
| Level 2 to 3 | 15.4 (1.3)         | 23.6 (13.4) | 0.021   | 0.4 (0.5)                | 0.3 (0.5)   | 0.711   |
| Level 2 to 4 | 29.7 (11.6)        | 31.0 (13.5) | 0.450   | 1.6 (2.1)                | 1.4 (3.0)   | 0.623   |

Table 3 – Comparison of Techniques 1 and 3 on Recurrence and Survival by Selective Neck Dissection

|              | Recurrence      |         | Disease-Free Survival |         | Overall Survival |         |
|--------------|-----------------|---------|-----------------------|---------|------------------|---------|
|              | OR (95% CI)     | p-Value | OR (95% CI)           | p-Value | OR (95% CI)      | p-Value |
| Level 1 to 3 | 1.7 (0.3, 11.8) | 0.575   | 1.1 (0.3, 3.2)        | 0.600   | 0.8 (0.2, 3.2)   | 0.756   |
| Level 1 to 4 | 1.1 (0.3, 4.6)  | 0.852   | 0.7 (0.3, 1.8)        | 0.451   | 1.2 (0.2, 7.3)   | 0.568   |
| Level 2 to 3 | 1.8 (0.9, 14.7) | 0.125   | 0.6 (0.3, 1.1)        | 0.108   | 2.3 (0.5, 10.0)  | 0.311   |
| Level 2 to 4 | 0.2 (0, 0, 1.5) | 0.216   | 0.8 (0.4, 1.5)        | 0.110   | 0.8 (0.2, 3.0)   | 0.770   |

\*adjusted for age, gender, BMI, extra-capsular extension

## Strengths

- First study to evaluate effect of lymph node processing technique on overall lymph node yield in neck dissections

## Limitations

- Small sample size; no direct comparison of technique on each sample
- Retrospective study
- Varying follow-up times for patient outcome

## Conclusions

- Pathological lymph node identification technique has an impact on overall nodal yield and by nodal yield by selective neck dissection.
- Association between lymph node processing technique and recurrence or survival not observed to be significant.

## Implications

- There is lack of established standardized surgical pathology method of lymph node specimen processing technique
- Pathologic staging is critical for overall staging and post-operative treatment, prognosis and surveillance; LN identification and sampling technique may impact patient therapy, prognosis, and survival.
- Future prospective study is needed for effect of processing technique on LN yield and patient outcomes.

## References

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