

Incidence and Clinical Impact of Chyle Leaks in Esophagectomy Patients After Routine Thoracic Duct Ligation



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Introduction

- Esophagectomy is a component of curative management for esophageal cancer, but it is associated with high morbidity.
- One challenging complication is chyle leaks, occurring in approximately 5% of cases.
- Prophylactic thoracic duct ligation (TDL) has been adopted in some centres as a preventative measure, though evidence for its benefit remains inconsistent.
- This study sought to determine the **incidence and short-term impact** of **postoperative chyle leak** in patients undergoing **esophagectomy with routine TDL** at our institution.

Methods

- Retrospective cohort study at a single, high-volume, university-affiliated thoracic and upper gastrointestinal surgery referral centre (2014-2024).
- Inclusion criteria: adults who underwent esophagectomy with TDL for oncologic resection
- Primary outcomes: incidence and severity of chyle leak
- Secondary outcomes: LOS, 30-day complications, ED visits, re-operations, ICU admission and LOS, readmissions, and mortality
- Propensity score matching (1:4 nearest neighbour) was used to adjust for baseline characteristics.

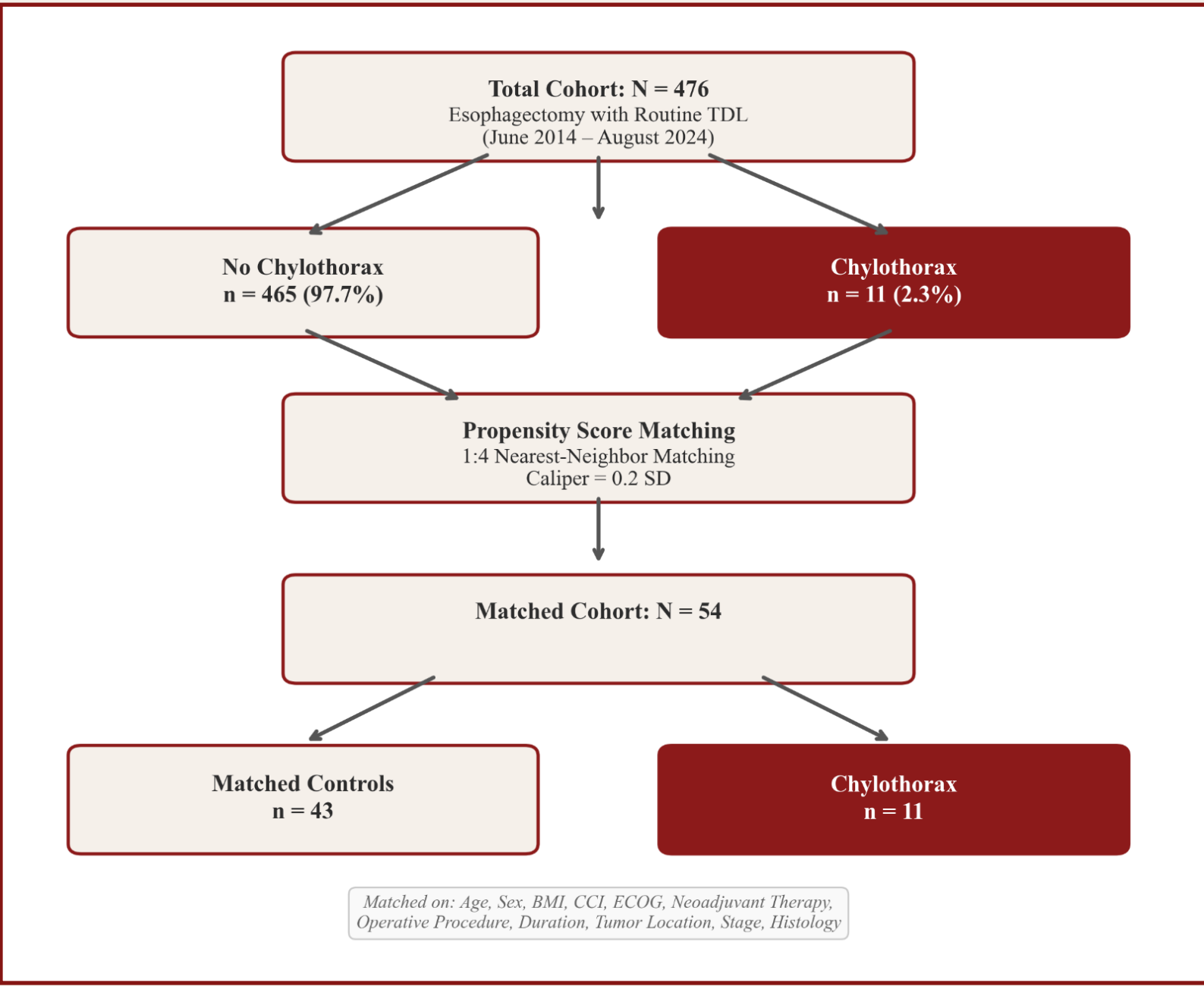


Table 1. Patient and Leak Characteristics of Postoperative Chylothorax Cases

Age	Sex	Tumor Location	Histologic Type	Procedure	Type of Chyle Leak	Severity of Chyle Leak	POD of Diagnosis	Intervention Required
69	F	Siewert 2	SCC	Ivor-Lewis	Type I	A	7	No
67	M	Siewert 1	ADK	Ivor-Lewis	Type I	A	6	No
67	F	Siewert 1	ADK	Ivor-Lewis	Type I	A	15	No
28	M	Siewert 2	ADK	Ivor-Lewis	Type I	A	6	No
44	M	Siewert 2	ADK	Ivor-Lewis	Type I	A	8	No
68	M	Siewert 2	ADK	Ivor-Lewis	Type I	A	6	No
55	M	Thoracic Proximal 1/3	SCC	3-Hole	Type II	B	14	No
68	M	Thoracic Proximal 1/3	SCC	3- Hole	Type II	B	12	No
76	M	Thoracic Distal 1/3	ADK	Ivor-Lewis	Type II	A	28	No
65	M	Thoracic Distal 1/3	SCC	3-Hole	Type III	B	27	Yes
58	M	Siewert 2	ADK	Ivor-Lewis	Type III	B	10	Yes

Table 2. Postoperative outcomes stratified by presence of chyle leak.

	No Chyle Leak N = 465 (97.7%)	Chyle Leak N = 11 (2.3%)	p-value
Median LOS, days [IQR]	8 [6-15]	13 [8-17]	0.093
30-Day Complication, n (%)	284 (61.1%)	11 (100.0%)	0.008*
Clavien-Dindo Grade, n (%)			0.168
1	21 (7.2%)	1 (9.1%)	
2	92 (31.5%)	2 (18.2%)	
3	75 (25.7%)	6 (54.5%)	
4	85 (29.1%)	1 (9.1%)	
5	19 (6.5%)	1 (9.1%)	
30-Day Reoperation, n (%)	70 (15.1%)	3 (27.3%)	0.218
30-Day ICU Admission, n (%)	109 (23.4%)	3 (27.3%)	0.726
Median ICU LOS, days [IQR]	5 [2-22]	15 [4-17]	0.592
30-Day ED Visit, n (%)	59 (12.7%)	6 (54.5%)	0.001*
Timing of ED Visit, Median POD [IQR]	16.5 [11-25.5]	20.5 [15-28]	0.334
30-Day Readmission, n (%)	46 (9.9%)	6 (54.5%)	<0.001*
Median Readmission LOS, days [IQR]	10 [4-29]	17.5 [11-23]	0.274
Same Admission DCD, n (%)	20 (4.3%)	1 (9.1%)	0.395

*Statistically significant at $p < 0.05$

Results

- N = 476 patients
 - Rates of open vs. minimally invasive approaches: 46.6% vs. 45.8%.
 - Most common operative procedure was the Ivor-Lewis esophagectomy (75.6%).
- Eleven patients (2.3%) developed postoperative chyle leak following routine TDL, most of which were low-output (<1L / day; 63.6%) and managed conservatively (54.5%).
- Patients with **chyle leaks** had **higher 30-day ER visits** (54.5% vs. 12.7%, $p = 0.001$) and **30-day readmissions** (54.5% vs. 9.9% $p < 0.001$) compared to patients who did not.
- **No significant differences** observed in **complication severity, hospital/readmission LOS, ICU admissions, re-operation rates, or mortality**.

Conclusion

- Postoperative chyle leak occurred in 2.3% of patients undergoing esophagectomy with routine TDL in this single-centre cohort.
- Most leaks were low-output and managed conservatively, though affected patients experienced higher 30-day ER visits and readmission rates, but otherwise they did not suffer more severe complications.
- Limitations: small number of events and absence of non-ligation comparator.