Mini Review

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Persistent Chyle Leak Post Mastectomy with Axillary Clearance: An Experience with Conservative Treatment vs Surgical Management

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Background

Chylous fistula, a complication related to thoracic duct injury or its branches, may develop following neck or thoracic abdominal surgery. Chyle is a milky fluid made up of emulsified fats (long chain triglycerides) and lymph derived from the absorption of fats from the small intestine into the lymphatic system. However, chyle leak after mastectomy with axillary clearance is an unusual phenomenon. Seroma formation and chronic lymphoedema of the upper limb are far more common. The reported incidence of chylous fistula after breast cancer surgery is less than 0.5%. It may delay wound healing, extend hospitalization, impair the immune system, and affect the initiation of adjuvant therapy. Although rare, it is important that all breast surgeons should be aware that a chylous fistula can develop after axillary dissection and its available treatment options. As this is a rare complication there is a paucity of evidence in its management strategies. The aim in this systematic review is to conduct a qualitative and/or quantitative synthesis of the literature and provide more robust recommendations for its management (conservative vs surgical modalities) to minimize the gap of knowledge though this study [1-5].

Study Aim and Objectives

- To investigate the treatment of post operative chyle leak after mastectomy.
- To study the risk factors for the occurrence of post operative chyle leak in patients that underwent mastectomy.
- To evaluate the permissible length of conservative treatment before progressing to surgical options
- To compare the numerous proposed conservative and surgical options to stop chyle leak.

Patient

Patients that undergone mastectomy and developed chyle leak post operatively

Intervention

The feasibility of treating patients conservatively.

Comparison

To progress to surgical management once conservative treatment fails.

Outcome

To study the complete resolution of chyle leak with the available treatment options (complications, prognosis).

Methods

Searches

Embase, MEDLINE and Web of Science were searched up to 01/11/22 for articles published in English.

Embase: ('chyle leak':ab, ti OR 'chyle leaks':ab, ti OR 'chyle leakage':ti OR 'chylothorax':ti OR 'thoracic duct':ti) AND ('mastectomy':ab, ti OR 'nipple sparing surgery with axillary clearance':ab

MEDLINE (PubMed): ((chyle leak[title/abstract]) OR chyle leaks[title/abstract]) OR (chyle leakage[title]) OR (chylothorax[title]) OR (thoracic duct[title])) AND ((mastectomy[title/abstract])

Web of Science: TS=("mastectomy" OR "chyle leak post mastectomy" OR "breast resection" OR "chyle leak post mastectomy")

Case reports were examined for procedure type, duration of leak and treatment strategy. Nevertheless, we will contact the corresponding author, by e-mail, for missing data that is needed for the systematic review. The references of systematic reviews that come up in the search will also be searched manually [5-10].

Types of Study to be Included.

Inclusion Criteria: Randomised controlled trials, cohort studies, retrospective reviews, cross-sectional studies.

Exclusion Criteria: case reports, case series (<20 patients), systematic reviews, editorials, conference abstracts, studies where full text not in English, studies that were not specific to chyle leaks after mastectomy. The trend in the management of chyle leak following mastectomy with axillary clearance are identified as follows:

1. Primary outcome: chylous leakage
2. Secondary Outcome:

Side affected.

Type of surgery.

Level of axillary clearance - level 1-3.

Age

Drain output - mls in first 24hrs, then average mls/24hrs overstay.

Management

Complications from procedure

Mortality rate

Measures of Effect

Primary outcome was the chyle leak rate, defined as the presence of milky, non-infectious discharge through the abdominal drain with triglyceride levels higher than 1.3 mmol/L and lower cholesterol levels than blood, was defined as chylous ascites.

Data Analysis

The data will be reviewed independently by two reviewers and demographic characteristics of the data set will be assessed. The level of axillary clearance, the status of the lymph nodes taken (metastatic or benign) and the number sampled, the diagnostic tool used, the date any chylous leak noted, initial management, chylous output, secondary management, and time of resolution will be assessed. Comparison with separate groups of those that need secondary surgical management and with those who has been treated successfully conservatively.

Data Synthesis

Risk ratio (RR) of dichotomous outcomes (i.e., chyle leak, overall morbidity, and anastomotic leak) and mean difference (MD) along with their variances of continuous outcomes will be studied. The heterogeneity will be estimated using the Cochrane's Q test and I^2 statistic and explored by using meta-regression. Publication bias will be assessed by Funnel plot and Egger test. A two-sided P-value < 0.05 considered to indicate significance.

Data Extraction

Data relating to multiple outcomes will then be extracted from the studies selected for inclusion, pertaining to side, age, type of surgery, level of axillary clearance (if applicable), drain output, subsequent management, length of stay, complications, and mortality.

Risk of Bias Assessment

As the study revolves around case reports, most of the data collected will be subjective and anecdotal. Hence, risk of bias assessment will not be necessary, other than to recognize the limitations within the methodology.

Ethical Approval

No ethical approval will be subjected as systematic reviews do not involve human participants, collecting new data or conducting primary research.

Subgroup Analysis

A subgroup analysis of those that require surgical management and those that are managed conservatively may be conducted.

Timescale

My aim to complete the research should be in a time frame of 6 months (Dec 2023- May 2024). The breakdown of the tasks are as follows:

A. September 2023- December 2023

- Establish research question.
- Complete the research protocol.
- Formulate research strategy.

B. December 2023- March 2024

- Establish research design.
- To register the protocol with PROSPERO

- Scoping for data via many of the search tools
- Formulate and write up data analysis.
- Collaborate with other co reviewers.

C. March 2024- May 2024

- Establish the first and second draft of the systematic review.
- Proofread and to commit final checks to the dissertation.
- Write up the dissertation and submit the assignment.

Contingencies

There are a few constraints that could be anticipated from conducting this research which are.

- Lack of resources/literatures
- Time constraints
- Potential problem with programming tool (STATA, SPSS)
- Falling sick
- Financial constraints

The alternatives that could be taken to minimize interruptions are.

- To prioritize the workflow of the research
- Identify electronic library resources that are needed.
- Identify support needed to access programming tools.
- Personnel that are unwell to stay home and to work remotely.
- Identify the research component which needs more time to be completed.
- Consider reaching out to funding agency program managers (Table 1).

Table 1.

Gantt Chart	Sept 2023	Oct 2023	Nov 2023	Dec 2023	Jan 2023	Feb 2023	Mac 2023	April 2023	May 2023
Identify research area	20th – 28th								
Formulate research question		16th-23rd							
Formulate research strategy, and select research design method			12th-28th						
Write research proposal				15th-28th					
Negotiate access					9th-15th				
Literature review					21st –29th				
Data collection						1st-25th			
Data Analysis							14th - 28th		
Write first draft								2nd-10th	
Write second draft								10th- 28th	
Write final draft									1st- 5th
Dissertation due									5th- 28th

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