

# The Underdiagnosis of Lymphedema: A Retrospective Analysis of 472 Edematous Arthroplasty Patients

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INTRODUCTION: Lymphedema is a known risk factor for post-operative complications following total joint arthroplasty. Even though these risks have been illustrated, current literature surrounding lymphedema in an arthroplasty context is limited. Extracellular water (ECW) divided by total body water (TBW) can be used to get a glimpse of the fluid balance in a patient's extremities. An ECW/TBW ratio over 0.40 is generally considered to be edematous. We sought to examine if patient's presenting to our clinics with edematous ECW/TBW leg ratios contained an ICD-10 diagnosis of edema or lymphedema in their chart.

## METHODS:

This was a retrospective analysis of patients who presented to an arthroplasty clinic. The study cohort was developed by analyzing bioimpedance results and selecting patients in the highest quintile of ECW/TBW leg ratio. Electronic medical records of these patients were searched for an ICD-10-CM diagnosis of lymphedema or edema. Mann-Whittney T-tests were performed to analyze differences in BMI and ECW/TBW leg ratios between the diagnosed and non-diagnosed portions of the cohort.

## RESULTS:

Of the 472 charts reviewed, 62 patients (13.1%) had an ICD-10-CM code for a diagnosis of either Lymphedema or Edema (Table 1). 4 (0.85%) of these patients had a diagnosis in the I89 (Lymphedema) grouping, 52 (11.0%) of these patients had a diagnosis in the R60 (Edema) grouping, and 6 (1.27%) of these patients had both (Table 1). The cohort was comprised of 211 males and 261 females, with an average BMI of 37.89 ± 9.8 kg/m2 with a range spanning from 15.2 kg/m2 to 76.2 kg/m2 (Table 2). The average leg ECW/TBW ratio was 0.42 ± 0.011 with a range spanning from 0.406 to 0.48 (Table 2). A full breakdown of the found ICD-10-CM codes and their frequency can be seen below (Table 3). There was no statistically significant difference between BMI (p=0.96) or ECW/TBW leg ratio (p=0.42) between the two groups (Table 4).

## DISCUSSION AND CONCLUSION:

Our results suggest lymphedema may be grossly underdiagnosed in total joint arthroplasty patients. In the highest quintile of edematous patients presenting to arthroplasty clinic, only 13.08% had a diagnosis of an edema condition. Only 2.11% of patient charts examined possessed a diagnosis of lymphedema. These results are stark when considering the suggested 30-37% complication rate patients with lymphedema carry post-total joint arthroplasty (TJA).

Number of Charts	ICD10 Diagnosis
52 (11%)	R60 (Edema and related conditions)
4 (0.8%)	I89 (Lymphedema and related conditions)
6 (1.2%)	Both
410 (86.7%)	None

Table 1. The number of charts possessing each diagnosis grouping

	N or Mean (SD)	Range
Males	211	
Females	261	
BMI (kg m <sup>-2</sup> )	37.89 (9.8)	15.2-76.2
Average Leg ECW/TBW ratio	0.42 (0.011)	0.406-0.48

Table 2. Demographics of the final cohort

Name	ICD 10 Code	Frequency
Anasarca	R60.1	2
Arm Edema	R60.0	1
Bilateral Leg Edema	R60.0	6
Bilateral Lower Extremity Edema	R60.0	12
Dependent Edema	R60.9	3
Edema	R60.9	9
Edema Extremities	R60.0	1
Edema of Both Lower Extremity	R60.0	1
Edema of Both Lower Legs	R60.0	1
Edema, Leg	R60.0	1
Edema, upperlimb	R60.9	2
Generalized Edema	R60.1	1
Leg Edema	R60.0	1
Leg Edema, Right	R60.0	2
Localized Edema	R60.0	3
Lower Extremity Edema	R60.0	6
Lower Leg Edema	R60.0	2
Plant Edema	R60.0	2
Peripheral Edema	R60.0	4
Elephantiasis	I89.0	1
Lymphedema	I89.0	1
Lymphedema due to lipedema	I89.0, R60.9	1
Lymphedema not elsewhere classified	I89.0	2

Table 3. All ICD10-CM Codes Recorded in Chart Review

	Contained a Diagnosis:	
	Yes	No
N	62	410
BMI (kg m <sup>-2</sup> )	37.9 ± 9.00	37.89 ± 9.96
Average Leg ECW/TBW ratio	0.420 ± 0.12	0.418 ± 0.01

Table 4. Comparison of coded and non-coded cohorts