

The Use of Bioimpedance Spectroscopy in the Evaluation of Simplified Lymphatic Microsurgical Preventing Healing Approach (S-LYMPHA) for the Prevention of Lymphedema

Abstract
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After Axillary Lymph Node Dissection

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Background

- Lymphedema (LE) can occur in up to 30% of patients who undergo axillary lymph node dissection (ALND).
- Simplified Lymphatic Microsurgical Preventing Healing Approach (S-LYMPHA) is a lymphatic flow preservation approach that has been shown to decrease the incidence of postoperative LE using the metric of arm circumference.
- Bioelectrical impedance ratio (L-Dex) measures changes in lymphatic flow in order to detect LE.
- L-Dex was introduced in our institution in June 2017 as a routine measurement in patients after ALND with or without S-LYMPHA as well as in patients with chronic lymphedema.
- In this study we use L-Dex ratio measurement as an objective assessment for LE in patients who underwent S-LYMPHA.

Methods

- We performed a retrospective review of all the patient who underwent L Dex and correlated it with ALND and S-LYMPHA data at a single institution.
- Medical records were reviewed for clinical evidence of LE.
- Statistical analysis was performed using SPSS 16.0 software.

Table

Objective and Clinical Lymphedema Incidence with and without Simplified Lymphatic Microsurgical Preventing Healing Approach

	ALND Alone	ALND with SLYMPHA	p-value
N	54 (62.8%)	32 (37.2%)	
L-Dex *	7.45 (-91 to 82)	0.60 (-8.4 to 9.2)	0.01
Abnormal L-Dex	29 (52.7%)	0 (0%)	<0.001
Clinical LE	39 (70.9%)	2 (6.2%)	<0.001

* Data reported as median (range), L-Dex = Bioelectrical impedance ratio, Abnormal L-Dex = Bioelectrical impedance ratio measure above +10 or below -10, LE = lymphedema.

Results

- 86 patients were included into the study.
- 54 (62.8%) patients underwent ALND alone and 32 (37.2%) underwent ALND with S-LYMPHA.
- LE occurred in 39 (70.9%) of the patients who underwent ALND alone and 2 (6.2%) of those who underwent ALND with S-LYMPHA (p<0.001).
- The median L-Dex was 7.45 (range -91 to 82) and 0.60 (range -8.4 to 9.2) for ALND alone and ALND with S-LYMPHA , respectively (p =0.01).
- Among patients with abnormal L-Dex ratios (> +10 or < -10), there were 0 patients who had undergone ALND with S-LYMPHA and 29 (52.7%) patients who had undergone ALND alone (p<0.001).
- 29 of 39 (74.3%) of ALND only patients with LE had an abnormal L-Dex ratio and 0 of 2 ALND with S-LYMPHA patients with LE were found to have an abnormal L-Dex ratio.

Limitations

- Disproportionality of cases compared to control.
- Inclusion of patients with chronic lymphedema.

Conclusion

- L-Dex is accurate in the identification of clinical LE in patients who have undergone ALND with S-LYMPHA.
- L-Dex may be considered as an adjunct in the diagnosis of LE in this patient population.
- S-LYMPHA is a reliable and effective technique that reduces the rates of post-operative lymphadema in breast cancer patients.

References

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