

# The Impact of Free Flap Harvest Laterality on Ambulatory Function in Lower Extremity Traumatic Reconstruction

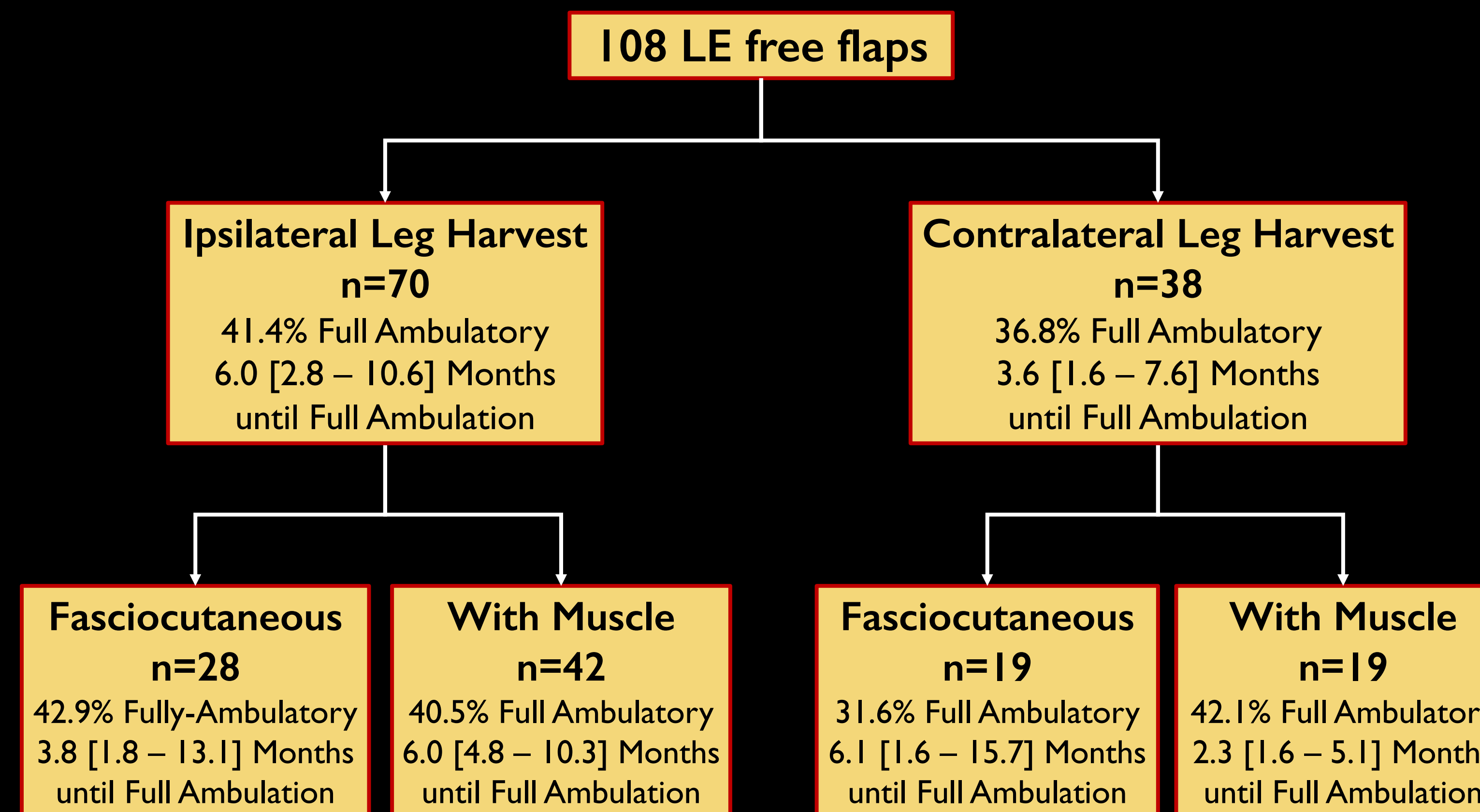
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## Background

- Over 250,000 lower extremity (LE) injuries requiring hospitalization occur annually in the United States, with 3,700 cases resulting in amputation
- Free tissue flaps** are essential for limb salvage in patients with LE trauma
  - However, significant **donor-site morbidity** could impact functional outcomes
- This study compares postoperative **ambulatory function** between **contralateral and ipsilateral free flap harvest** in LE traumatic reconstruction

## Methods

- Retrospective review using a prospectively maintained database at a **Level I Trauma Center** from January 2009 to June 2022
  - Patients who underwent microsurgical LE reconstruction with a free flap that was harvested from the LE were included
- Demographics, comorbidities, flap and injury characteristics, and ambulatory function were collected
  - Flap harvest laterality** was determined in relation to the wounded leg
  - Flaps were categorized as either **fasciocutaneous** or those that included a **muscle component** (muscle/myocutaneous).
- Statistical analysis: Chi-squared, Mann Whitney U test, and Kaplan-Meier analyses



## Results

- 108 LE free flaps were placed on 100 patients:
  - 70 (64.8%) **ipsilateral** leg harvest
  - 38 (35.2%) **contralateral** leg harvest
- There was **no significant difference** in age, comorbidities, **GA classification**, or **flap/defect size** between cohorts
- Full ambulation was achieved in 29 (41.4%) patients in the ipsilateral cohort compared to 14 (36.8%) in the contralateral one ( $p=0.642$ )
- Median time to full ambulation did not vary between cohorts ( $p=0.174$ )

Upon subgroup analysis based on flap composition, comparing ipsilateral vs. contralateral:

### Fasciocutaneous

- Full Ambulatory: 42.9% vs. 31.6%;  $p=0.435$
- No significant difference in time to Full Ambulation: 3.8 vs. 6.1;  $p=0.733$

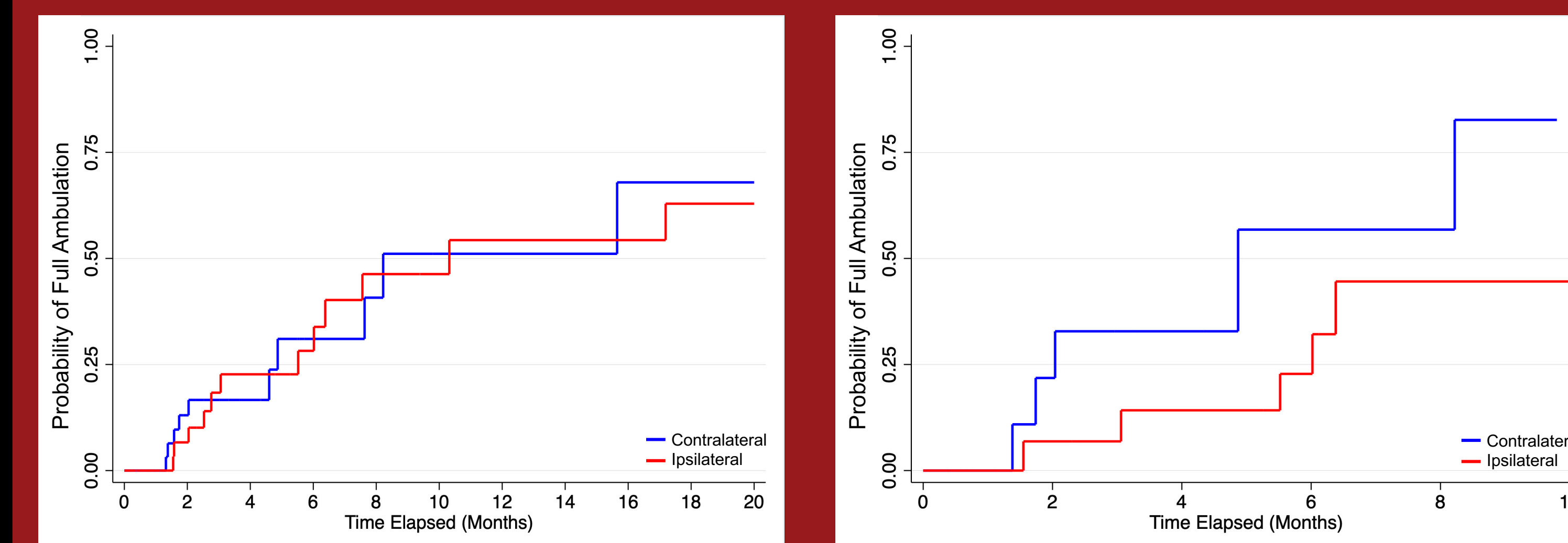
### Muscle Component

- Full Ambulatory: 40.5% vs. 42.1%;  $p=0.905$
- Prolonged time to full ambulation**: 6.0 vs. 2.3 months;  $p=0.017^*$
- Among free flaps with a muscle component, contralateral flap harvest had a **significantly higher predicted 6-month full ambulation rate** compared to the ipsilateral cohort (56.8% vs. 22.8%;  $p=0.008$ )

## Conclusion

- Among free flaps with an added muscle component, contralateral leg harvest **promoted faster recovery** to full ambulation compared to ipsilateral
- Surgeons may consider harvesting from a donor site on the contralateral leg if the flap reconstruction **requires a muscle component**

**Figure 1.** Adjusted Kaplan-Meier Analysis Estimating the Probability of Full Ambulation based on Flap Harvest Laterality among: A) All Free Flaps and B) Free Flaps with a Muscle Component



### 6-Month Predicted Full Ambulation Rate

Contralateral: 31.3%  
 Ipsilateral: 29.3%  
 $p=0.618$

### 6-Month Predicted Full Ambulation Rate

Contralateral: 56.8%  
 Ipsilateral: 22.8%  
 $p=0.008^*$

\*All Kaplan-meier analyses were adjusted for age and flap/defect size