PS-4

Thigh muscle index as the valuable prognostic marker in liver transplantation patients

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Background

- In **liver transplantation (LT)**, it is important to decide the optimal recipients, and **MELD score** was used.
- **Sarcopenia** has been evaluated due to **the limitation of MELD score** that did not reflect functional status.
- The importance of the **thigh muscle in evaluating sarcopenia instead of L3** has been highlighted recently, because it's an **antecedent finding** of skeletal muscle loss and also the key muscle for **physical function**.
- **Best reference site for evaluating sarcopenia**, and **long-term composition changes** were still not clear.

Objective

- To evaluate probability of **the pre-operative thigh muscle index** as **the prognostic factor in LT**
- Tracking the **5-year longitudinal changes of muscle indexes** in post-LT patients to evaluate whether this could be **an antecedent finding of the patient's outcome**

Method

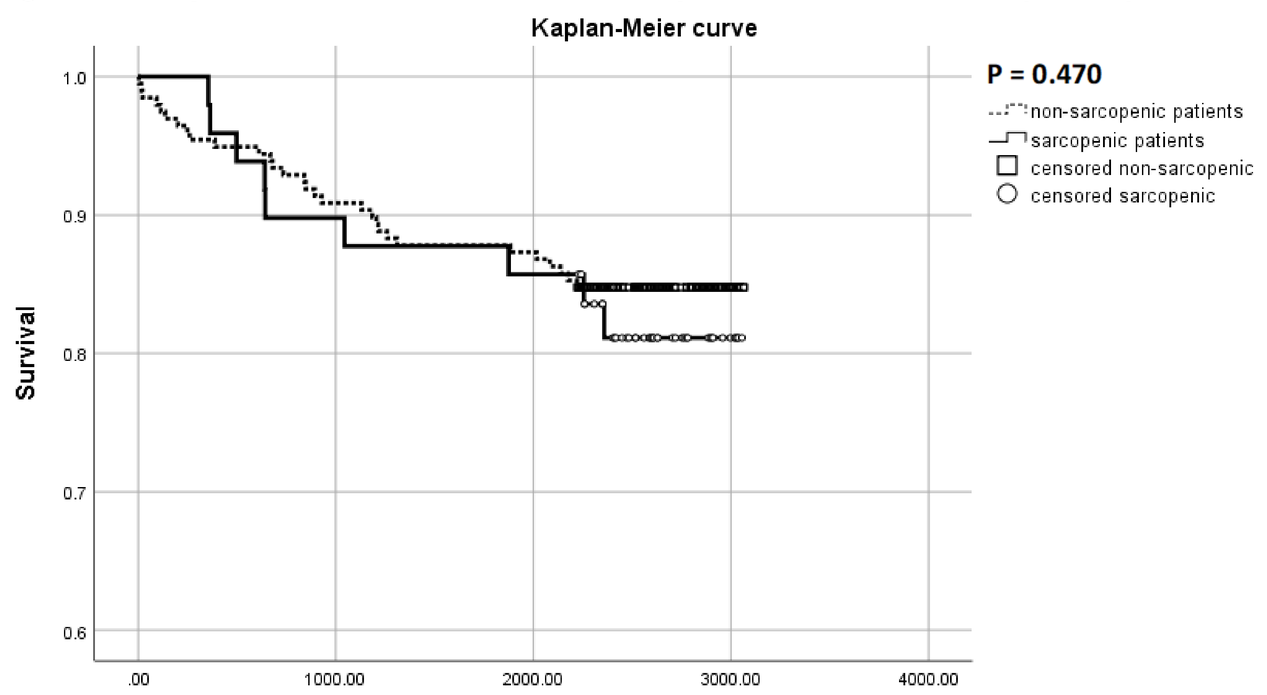
- **Study design:** Retrospective medical chart review (January 2013 to May 2015)
- **Inclusion criteria:** 246 male recipients aged 40 to 60 who underwent LT
- Skeletal muscle areas from the CT scan in **Upper thigh (UT) and L3 level** were measured by AI technology.
- **Skeletal muscle indexes** were defined by muscle areas divided by height square.
- **Low muscle index or sarcopenic group** was defined as the bottom 20% of the patients.
- **Statistical analysis:** The logistic regression analysis was performed to evaluate the associations between muscle indexes and ICU day, hospital day, and ventilator day. The Cox proportional hazards regression model was used to determine whether low pre-LT L3, UT muscle indexes affect the post-LT survival. The linear mixed model was used to compare the longitudinal change in expired and survived groups.

Result

Variables	Logistic regression analysis (n=246)			
	Coefficient (B)	p-value	Exp(B)	Regression summary
L3 Skeletal Muscle Index				
Constant	-13.861	<0.01*	0	
Age	0.046	0.219	1.047	
MELD	0.007	0.677	1.007	R^2 = 0.302
L3 SMI	-0.075	0.013	.928	
BMI	0.565	<0.01*	1.759	
Upper thigh Skeletal Muscle Index				
Constant	-15.099	<0.01*	0	
Age	0.067	0.091	1.069	
MELD	0.000	0.981	1.000	R^2 = 0.378
UT SMI	-0.071	<0.01*	0.931	
BMI	0.697	<0.01*	2.008	

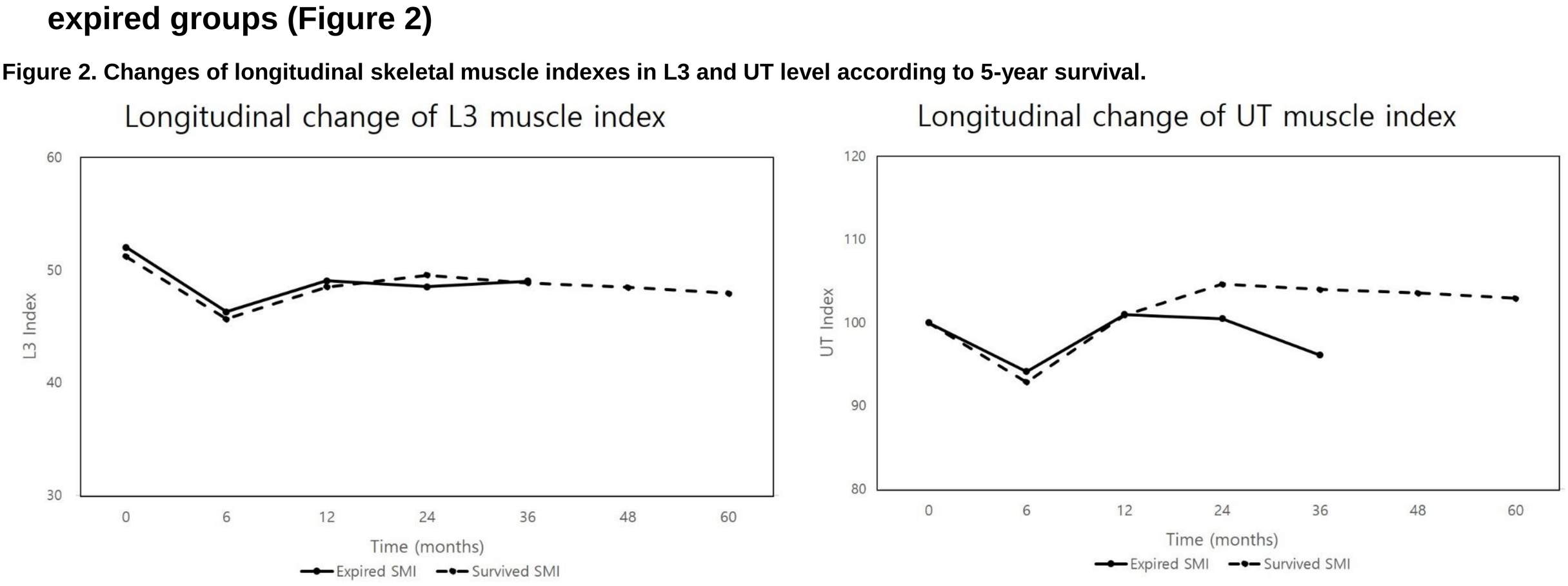
Table 1. Summary of logistic regression analysis for hospital days.
Abbreviations: SMI, Skeletal muscle index; UT, Upper thigh.
*p-value<0.05, logistic regression analysis, 30 days

Figure 1. Kaplan-Meier curve of UT sarcopenic and non-sarcopenic patients.



- **Significant relationships** between **the low muscle indexes and the prolonged hospital day (Table 1)**
- No significant relationships between Post-LT survival and L3 (p=0.63), UT muscle index (p=0.47) **(Figure 1)**
- In tracking the 5-year longitudinal body composition changes, **only the UT muscle index decreased** in the **expired groups (Figure 2)**

Figure 2. Changes of longitudinal skeletal muscle indexes in L3 and UT level according to 5-year survival.



Conclusion

- The **UT muscle index** showed **significant relationships with LT outcomes**, not inferior to L3 level and it also seemed to detecting the **change of body compositions of deteriorated post-LT patients**.
- Therefore, it might be **valuable to measuring the UT muscle index for managing LT patients**.