FIVE-FACTOR MODIFIED FRAILTY INDEX AS A PREDICTOR OF COMPLICATIONS FOLLOWING TOTAL ANKLE ARTHROPLASTY

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DISCLOSURES

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BACKGROUND

- Ankle arthritis has significant negative impact on function, quality of life
- Total ankle arthroplasty (TAA) is emerging treatment option for advanced ankle arthritis
  - Patient selection for TAA currently evolving

- Frailty = syndrome of age-related physiologic deficits resulting in increased susceptibility to adverse health outcomes
  - Found to predict poor prognosis and postoperative complications
- Frailty index allows for measurement of degree of frailty (via deficit accumulation)
  - **Modified 5-factor frailty index (mFI-5)** associated with adverse outcomes following shoulder, hip, and knee arthroplasty
    - Not yet studied in regards to TAA

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PURPOSE/HYPOTHESIS

- Aim: To evaluate the suitability of the mFI-5 as a risk stratification tool in TAA

- Hypothesis: Patients with greater frailty (as defined by the mFI-5) will have higher postoperative complication rates following TAA

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METHODS

- Retrospective chart review of National Surgical Quality Improvement Program (NSQIP) database between 2011 and 2017
- NSQIP queried for TAA by CPT code (27702)
- Collected patient demographics, 30-day complication data, length of stay
  - Complications: "cardiac", "pulmonary", "hematology", "renal", stroke/central nervous system", "infection", "wound", Clavien-Dindo IV complications, adverse discharge, 30-day reoperation, 30-day readmission, mortality
- Exclusion criteria: patients missing data for variable of interest
- Primary outcome: rate of patients experiencing at least 1 complication ("any complication")

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METHODS

- Calculated mFI-5 score for each patient
  - Sum all variables present for mFI-5 score (possible score of 0-5)
- Performed bivariate analysis, followed by multivariate logistic regression analysis (controlling for age, sex, BMI, operative time, length of stay)

Variables	Present	Score
Diabetes + Meds	Yes	1
HTN + Meds	Yes	1
CHF	No	0
COPD/Pneumonia	No	0
Non-Independent Function	No	0
	Total mFI-5 Score:	**2**

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RESULTS

- 1035 → 1028 patients
  - Average age 63.9 years; majority male (51.1%), white (83.1%), ASA class 2 (56%), overweight (35.7%), mFI-5 score 1 (46.6%)
  - Low frequency of patients with higher scores, so analyzed patients within groups (0, 1, ≥2)

mFI-5 Score	Number of Patients
0	420
1	479
2	122
3	5
4	2
5	0

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RESULTS: BIVARIATE ANALYSIS

- Overall complication rate: 10.4%

- Significant findings as mFI-5 score increased from 0 to ≥2:

1. Risk of sustaining **any complication** increased from 5.24% to 19.38%
2. Risk of **adverse discharge** increased from 3.8% to 15.5%
3. Risk of **30-day readmission** increased from 0.24% to 3.1%
4. Risk of **wound complication** increased from 0.2% to 1.6%

Bivariate Analysis: Adverse Outcome versus mFI-5 Score					
		mFI-5 Score			
	Overall (n, %)	0 (n, %)	1 (n, %)	≥2 (n, %)	
	N=1028	N = 420	N = 479	N = 129	
Outcome					*P*-Value
Readmission	10, 1.0	1, 0.2	5, 1.0	4, 3.1	**0.017***
Reoperation	4, 0.4	1, 0.2	1, 0.2	2, 1.6	0.14
Mortality	3, 0.3	2, 0.5	1, 0.2	0, 0	0.61
Adverse Discharge	87, 8.5	16, 3.8	51, 10.7	20, 15.5	**<0.0001***
Cardiac	1, 0.1	0, 0	1, 0.2	0, 0	1
Pulmonary	4, 0.4	2, 0.5	2, 0.4	0, 0	1
Hematology	6, 0.6	1, 0.2	4, 0.8	1, 0.8	0.41
Renal	0, 0	0, 0	0, 0	0, 0	N/A
Infection	5, 0.5	1, 0.2	3, 0.6	1, 0.8	0.55
Wound	3, 0.3	1, 0.2	0, 0	2, 1.6	**0.021***
Stroke	0, 0	0, 0	0, 0	0, 0	N/A
Clavien-Dindo IV	4, 0.4	2, 0.5	2, 0.4	0, 0	1
Any Complication	107, 10.4	22, 5.2	60, 12.5	25, 19.4	**<0.0001***

* Statistically significant.

RESULTS: MULTIVARIATE ANALYSIS

- Risk of sustaining **any complication** significantly increased with mFI-5 score of 0 vs ≥2
  - 5.24% → 19.38%
  - **OR 2.28**, 95% CI 1.08-4.82, *P* = .03
- Risk of **30-day readmission** significantly increased with mFI-5 score of 0 vs ≥2
  - 0.24% → 3.1%
  - **OR 73.02**, 95% CI 3.60-1480.20, *P* = .005
  - Significance maintained with having only **one** mFI-5 factor (**1.04%**; **OR 17.46**, 95% CI 1.10-277.23, *P* = .04)

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CONCLUSION

- TAA is emerging as common surgical option for advanced ankle arthritis
  - Evolving patient selection and identified pre-operative risk factors
- Frailty (as defined by the mFI-5) is associated with increased complication rates following TAA
- mFI-5 is a potential risk-stratification tool for patients considering TAA

THANK YOU

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