

How Do the Functional Outcomes Vary Based on Ethnicity and Sex Following Tumor Resection and Endoprosthetic Reconstruction? – A Secondary Analysis from the PARITY trial

Marcos R Gonzalez, Joseph Oliver Werenski¹, Mark C Gebhardt, Michelle A Ghert, Santiago Andres Lozano Calderon²
¹Massachusetts General Hospital, ²Massachusetts General Hospital - Harvard Medical S

INTRODUCTION:

Substantial disparities in post-operative outcomes across ethnicities have been documented in the orthopaedic literature. Yet, it remains uncertain whether similar patterns exist in functional outcomes following endoprosthetic reconstruction. We performed a secondary analysis of the Prophylactic Antibiotic Regimens in Tumor Surgery (PARITY) trial to assess how sex and ethnicity affect post-operative functional outcomes.

METHODS: The PARITY study was a blinded, multicenter, randomized controlled trial evaluating the impact of postoperative intravenous prophylactic antibiotic duration on the rate of surgical site infection after lower-extremity tumor resection and endoprosthetic reconstruction. Demographic, clinical, and operative parameters were assessed. We stratified into 5 groups based on ethnicity. Functional outcomes were assessed at 4 timepoints: baseline, and 3 months, 6 months, and 12 months post-operatively. Functional outcome scores were measured using the Musculoskeletal Tumor Society 1987 (MSTS87), MSTS93, and the Toronto Extremity Salvage Score (TESS) questionnaires. Differences between groups were measured using T-tests or one-way analysis of variance (ANOVA).

RESULTS: Out of 604 patients included, the main ethnicities were White (63.6%), Asian (18.7%), Black (7.1%), Hispanic (5.6%) and Other (5%). Median age was higher in White patients compared to Asian, Black, and Hispanic patients. Systemic metastases were less frequent in Asian patients (Table 1). Asian patients showed higher MSTS87, MSTS93, and TESS scores compared to other groups (Figure 1). There were no differences between White, Black, and Hispanic patients at any timepoint. Males had higher baseline functional score. However, except for 6-month MSTS93, no differences in post-operative functional outcomes between sexes were noted.

DISCUSSION AND CONCLUSION: Higher functional outcomes after endoprosthetic reconstruction were observed in Asian patients. Contrary to the expected, minorities did not exhibit poorer functional outcomes compared to White patients. Further studies should assess whether these patterns hold true within specific countries.

Figure 1. Functional outcomes of patients based on ethnicity and sex. Lines refer to mean values and 95% confidence intervals.

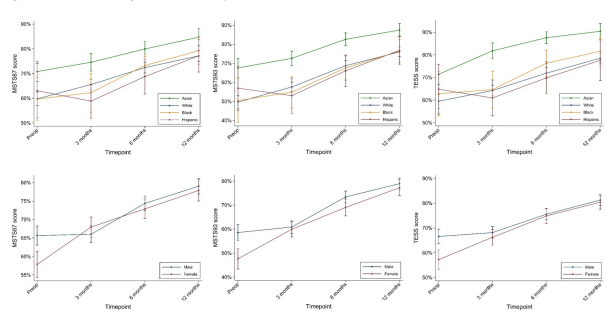


Table 1. Baseline demographics of study cohort.

	All (N = 604)	White (N = 384)	Asian (N = 113)	Black (N = 43)	Hispanic (N = 34)	Other (N = 30)	p-value
Age *	40 (19, 61)	52 (23, 64)	21 (17, 35)	25 (15, 51)	29 (17, 42)	51 (23, 62)	<0.001
Female sex	243 (40.2%)	167 (43.5%)	40 (35.4%)	17 (39.5%)	12 (35.3%)	7 (23.3%)	0.15
Tumor type							0.063
Bone tumor	486 (80.5%)	301 (78.4%)	104 (92.0%)	32 (74.4%)	27 (79.4%)	22 (73.3%)	
Soft tissue sarcoma	62 (10.3%)	40 (10.4%)	7 (6.2%)	6 (14.0%)	4 (11.8%)	5 (16.7%)	
Metastatic bone disease	56 (9.3%)	43 (11.2%)	2 (1.8%)	5 (11.6%)	3 (8.8%)	3 (10.0%)	
Type of tumor							<0.001
Osteosarcoma	267 (44.2%)	143 (37.2%)	67 (59.3%)	26 (60.5%)	19 (55.9%)	12 (40.0%)	
Giant cell tumor of bone	43 (7.1%)	17 (4.4%)	14 (12.4%)	4 (9.3%)	6 (17.6%)	2 (6.7%)	
Non-osteogenic sarcoma of bone	27 (4.5%)	23 (6.0%)	0 (0.0%)	3 (7.0%)	2 (5.9%)	1 (3.3%)	
Chondrosarcoma	103 (17.1%)	85 (22.1%)	8 (7.1%)	1 (2.3%)	2 (5.9%)	7 (23.3%)	
Ewing sarcoma	40 (6.6%)	24 (6.3%)	15 (13.3%)	0 (0.0%)	1 (2.9%)	0 (0.0%)	
Other	124 (20.5%)	92 (24.0%)	9 (8.0%)	9 (20.9%)	6 (17.6%)	8 (26.7%)	
Tumor location							0.018
Femur	493 (81.6%)	330 (85.9%)	81 (71.7%)	36 (83.7%)	26 (76.5%)	20 (66.7%)	
Tibia	104 (17.2%)	49 (12.8%)	31 (27.4%)	6 (14.0%)	9 (25.5%)	10 (33.3%)	
Femur and tibia	5 (0.8%)	4 (1.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Other	2 (0.3%)	1 (0.3%)	1 (0.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Systemic metastases	105 (17.4%)	76 (19.8%)	9 (8.0%)	8 (18.6%)	8 (23.5%)	4 (13.3%)	0.044
Diabetes	44 (7.3%)	38 (9.9%)	2 (1.8%)	1 (2.3%)	0 (0.0%)	3 (10.0%)	0.009
Tobacco use							<0.001
No	450 (74.5%)	262 (68.2%)	104 (92.0%)	34 (79.1%)	28 (82.4%)	22 (73.3%)	
Yes	60 (9.9%)	47 (12.2%)	0 (0.0%)	6 (14.0%)	3 (8.8%)	4 (13.3%)	
Yes, quit	94 (15.6%)	75 (19.5%)	9 (8.0%)	3 (7.0%)	3 (8.8%)	4 (13.3%)	
Operative time (min) *	270 (205, 377)	286 (200, 403)	247 (220, 270)	269 (200, 360)	271 (150, 360)	262 (200, 392)	0.063
Neoadjuvant QT	290 (48.0%)	156 (40.6%)	81 (71.7%)	20 (46.5%)	17 (50.0%)	16 (53.3%)	<0.001
Neoadjuvant RT	22 (3.6%)	19 (4.9%)	0 (0.0%)	1 (2.3%)	1 (2.9%)	1 (3.3%)	0.17

QT: chemotherapy; RT: radiation therapy. * Values displayed refer to median and interquartile ranges between brackets.