Patient Factors Predict Soft-Tissue Complications Following Ankle Fracture Surgery

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Purpose: Forces causing bimalleolar or trimalleolar fracture may be greater than for isolated distal fibular fracture. Poor baseline tissue quality, large body mass, and mechanism will affect severity of displacement. This study investigates factors predictive of soft-tissue complications following ankle fracture.

Methods: 788 ankle fractures were classified as 44B1 or 44B2.1: lateral, posterior, or medial malleolar; 44B2.2 bimalleolar; or 44B3 trimalleolar. Associated dislocations and open fractures were documented. Soft-tissue complications included wound dehiscence and infection.

Results: Mean age was 43 years, mean body mass index (BMI) was 32, and 16% had diabetes mellitus. Most patients with BMI >30 had diabetes. After bimalleolar fracture, presence of neuropathy (P = 0.001) or BMI >30 (P = 0.014) increased the odds of soft-tissue complication by 30.3 and 4.0 times, respectively. Open fractures were predictive of complications after trimalleolar fractures, increasing the odds ratio by 11.7 (P = 0.006). No factors were predictive of soft-tissue complications in patients with isolated medial or lateral malleolar fractures.

Conclusion: Neuropathy and obesity predicted complications. Number of injured malleoli may account for energy of injury and fracture complexity, demonstrating the breadth of difference in the larger Diagnosis Related Group (DRG) 563. While these injuries are reimbursed by DRG, this study shows that outcomes are affected by conditions placing soft tissues at risk. Utility of risk-adjusted reimbursement should be considered to compensate for the expectation of soft-tissue compromise.

Malleolar Group	Soft-Tissue Compromise	Frequency	Percent
1	None	44	75.9%
	Superficial	10	17.2%
	Deep	4	6.9%
	Total	58	100.0%
2	None	162	77.5%
	Superficial	41	19.6%
	Deep	6	2.9%
	Total	209	100.0%
3	None	85	71.4%
	Superficial	31	26.1%
	Deep	3	2.5%
	Total	119	100.0%

Malleolar Group	Mean BMI	Diabetes	Patients w/ BMI>=30	Fisher's Exact
1	30.97	No	28	p=0.425
	34.83	Yes	30	
2	30.81	No	90	p=0.009
	38.09	Yes	119	
3	30.87	No	54	p=0.07
	34.22	Yes	65	

See pages 401 - 442 for financial disclosure information.