



Length of Stay and Hospital Cost Comparison in Hind Foot and Ankle Surgery on Patients With Anxiety and Depression Versus Those Without Psychopathology Diagnoses.

Christopher J. Betrus DPM; Sham J. Persaud DPM; Stephanie Campbell DPM; Alan R. Catanzariti DPM, FACFAS



The Foot & Ankle Institute, West Penn Hospital, Allegheny Health Network, Pittsburgh, PA

Purpose

To evaluate if patients with depression and/or anxiety have more post-operative pain, necessitating more pain medication and requiring longer hospital stays, corresponding to increased costs following elective hind foot and/or ankle surgery.

Methodology/Hypothesis

It is our hypothesis that patients with anxiety and/or depression diagnoses have an increased length of stay (LOS), leading to a higher cost associated with their surgical course. We examined the length of stay for patients who underwent hind foot and/or ankle surgery with and without a diagnosis of anxiety and/or depression.

Subjects were identified using a searchable computerized hospital database between the years 2015 to 2017. Patients with anxiety and/or depression diagnoses were identified by searching ICD-10 codes. Randomly, an equal amount of patients who underwent hind foot and ankle surgery without those diagnoses were used for comparison.

Patient exclusion criteria included patients under the age of 18 years, patients who underwent surgery but were not admitted to the hospital, and patients who had surgery for infection or Charcot reconstruction.

Data was compiled including age of patient, patient gender, psychopathology type, surgical procedures performed, LOS, overall pain score on the Visual Analog Scale (VAS), and amount of pain medication needed during admission. Statistical analysis was then performed comparing length of stay, pain scale, and pain medication use between the two groups, and a cost comparison analysis was extrapolated from these findings.

Literature Review

Generally, patients with diagnoses of anxiety and depression suffer from some kind of MSK pain.¹ The literature has shown that anywhere from 21% to 89% of patients presenting to orthopedic and rheumatology clinics have been previously diagnosed with depression.²

Literature Review

Additionally, studies have shown that patients with MSK pain are twice as likely to develop an anxiety disorder compared to those without MSK pain.³ Ellis et al. revealed that patients with psychopathology diagnoses were likely to feel more pain pre- and post-operatively following knee arthroplasty, with more disability post-operatively.⁴ Baumeister et al. showed patients with anxiety and depression with chronic back pain required more diagnostic tests and often a higher cost of treatment.⁵

With the limited literature presently focused on foot and ankle surgery, it has been shown that individuals with moderate to severe foot pain are two times more likely to develop depressive symptoms.^{1,6-10} Nakagawa et al. revealed that roughly 30% of patients with chronic foot and ankle pain had anxiety or depression, and this patient population showed higher VAS scores than patients without psychopathology. This patient population also showed a significant difference in quality of life survey scores as well.¹

Unfortunately, the literature regarding foot and ankle pain in relation to anxiety and depression involves chronic diabetic foot pain and disorders or chronic foot pain. There is virtually no literature discussing anxiety and depression in relation to foot surgery and the relationship to cost of foot surgery.

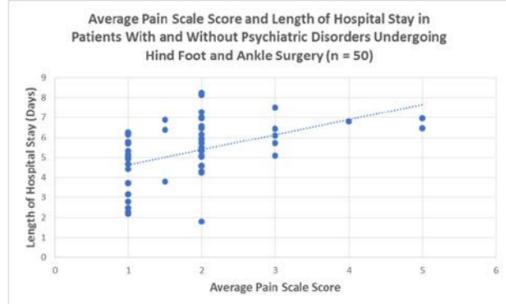


Table 1 Baseline Demographic and Clinical Characteristics (n = 50)

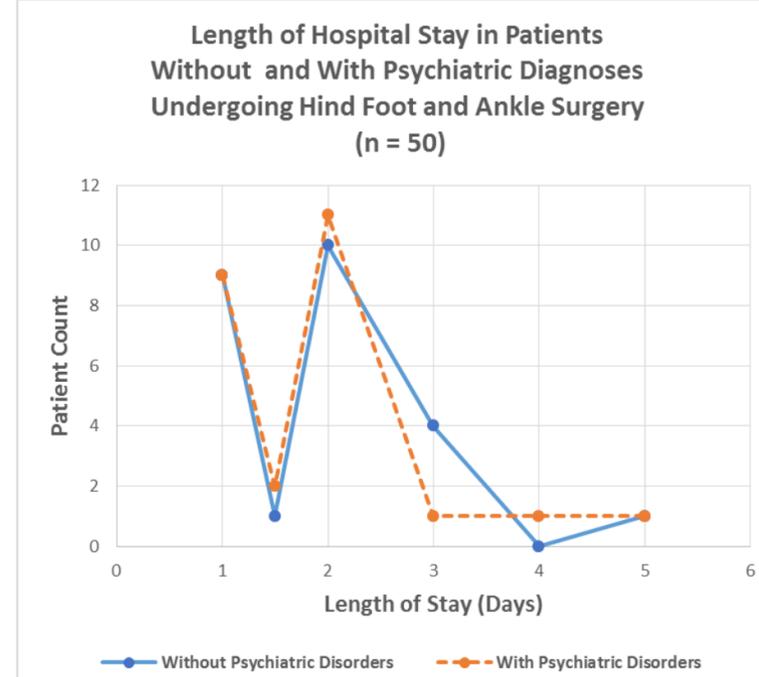
Variable	Without Psychiatric Diagnoses (n = 25)	With Psychiatric Diagnoses (n = 25)	P-value
Age	52.4 ± 13.7	46.2 ± 12.1	.098
Gender			.08
Male, n (%)	12 (48.0)	6 (24.0)	
Female, n (%)	13 (52.0)	19 (76.0)	
Diagnoses, n (%)			
Anxiety	5 (20.0)		
Anxiety + Other	2 (8.0)		
Depression	5 (20.0)		
Depression + Other	0		
Diagnosis other than Anxiety or Depression	4 (16.0)		
Anxiety + Depression	5 (20.0)		

Table 2 Procedure Data (n = 50)

Variable	Without Psychiatric Diagnoses (n=25)	With Psychiatric Diagnoses (n=25)	P-value
Procedure category, n (%)			.94
Hind foot surgery	10 (40.0)	10 (40.0)	
Ankle surgery	7 (28.0)	8 (32.0)	
Both	8 (32.0)	7 (28.0)	
Hospital LOS (days) median [IQR]	2 [1.0]	2 [1.0]	.72
Hospital LOS (days) by Procedure			
Hind foot surgery median [IQR] (n = 10)	1.8 [IQR, 1.0]	2 [IQR, 1.0]	.58
Ankle surgery, Median [IQR] (n = 7)	2 [IQR, 2.0]	1.8 [IQR, 1.0]	.23
Hind foot and Ankle surgery (n = 8)	1.9 ± .83	2.1 ± 1.5	.67
Pain Scale	4.9 ± 1.5	5.7 ± 1.5	.83
Hospital LOS (days) by Patient Gender (median, IQR)			
Male	1.75 [1.8] (n = 12)	1.5 [1.8] (n = 6)	.89
Female	2 [1.0] (n = 13)	2 [1.0] (n = 19)	.65

Table 3 Pain Management, Discharge and Attending Physician (n = 50)

Variable	Without Psychiatric Diagnoses (n=25)	With Psychiatric Diagnoses (n=25)	P-value
Pain Management Consult, n (%)	0	3 (25)	.235
Readmission within 30-days, n (%)	0	1 (4.0)	1.0
Total Narcotic Use (dose), median (IQR)	9 [13.0]	13 [12.0]	.18
DM, n (%)	6 (25.0)	3 (12.0)	.29
Drain, n (%)	7 (30.4) (n = 23)	7 (28.0)	.85
Skilled Nursing Facility, n (%)	2 (8.0)	4 (16.0)	.667



Results

Key Findings

The patient groups (without versus with psychiatric disorders) did not differ significantly with respect to any of the study variables.

There was a statistically significant and positive correlation between the Pain Scale score and Hospital LOS (days). As the Pain Scale score increased, the patient's LOS (days) increased (Spearman's rho (n = 50) = .534, p = .001).

Details

A higher percentage of female patients had psychiatric diagnoses compared to male patients (76% versus 24%) however, this difference was not statistically significant (p = .08).

Hospital LOS (days) did not differ significantly between patients without psychiatric disorders versus with psychiatric disorders for any surgical procedure (Hind foot surgery, p = .58; Ankle surgery, p = .23; both hind foot and ankle surgery, p = .67).

Patients without psychiatric disorders had a slightly lower mean pain scale score compared with patients with psychiatric disorders (4.9 ± 1.5 versus 5.7 ± 1.5). However, this difference was not statistically significant (p = .83).

Analysis/Discussion

While it is difficult to assess the true cost of each day spent in the hospital, the national Health Insurance Marketplace, *HealthCare.gov*, states a three day stay in the hospital will cost on average about \$30,000 for an uninsured payer. This is an incredible burden on patients, especially considering they will likely be out of work for a significant amount of time following surgery.

Through comparing the LOS between our study group and our control group, a diagnosis of depression and/or anxiety did not seem to extend the length of time admitted to the hospital. We found, as expected, the average VAS pain score was increased in the study group, which has been previously seen in the available literature.

Analysis/Discussion

Interestingly, we also found that the study group required significantly more pain medication when compared to the control group. While this agrees with the increased pain reported in the study group, the increase in pain medication does not appear proportional to the pain reported.

We believe more thorough evaluation of the patient pre-operatively, combined with non-narcotic pain medications like NSAIDs and neuromodulators, would help to mitigate the need for excessive narcotics. More investigation is needed into multi-modal pain medication use, as well as immediate re-institution of home medications, for patients undergoing hindfoot and/or ankle surgery with depression and /or anxiety.

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