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Original Research

The Influence of Mental Health Diagnoses on Patient Experiences and Outcomes in Patients Undergoing WALANT Hand Surgery

Brian Ford, MD, [*] Dillon Neumann, BS, [*] Matthew Pina, MD, [*] Rafael Olivieri-Ortiz, BS, [†] Joel Ferreira, MD, [*] Anthony Parrino, MD [*]

[*] Department of Orthopaedic Surgery, University of Connecticut Health Center, Farmington, CT
[†] University of Connecticut School of Medicine, Farmington, CT

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Purpose: The purpose of this study was to gauge whether patients with preexisting mental health conditions have desirable outcomes when undergoing wide-awake local anesthesia with no tourniquet (WALANT) hand surgery.
Methods: A retrospective review of 133 patients who underwent WALANT surgery by 2 senior authors from August 2019 to October 2020 was performed. Patients were administered a 10-question post-operative survey detailing perioperative pain, experience, and satisfaction concerning their procedure. Analysis was performed for patient responses to the questionnaire, demographics, comorbidities, and patient-reported outcomes using the Single Assessment Numeric Evaluation (SANE).
Results: There were 61 patients identified as having a preexisting psychiatric diagnosis compared to 70 patients without who underwent WALANT surgery. Comparing psychiatric diagnosis and nonpsychiatric diagnosis cohorts, there was no significant difference in preoperative anxiety (3.75 vs 3.30), pain during procedure (0.67 vs 0.56), or pain after surgery (4.89 vs 4.26). There was a significantly higher pain score with preoperative injection in the psychiatric diagnosis cohort (4.07 vs 2.93). When asked if they would have a WALANT procedure again, 95.1% of patients in the psychiatric diagnosis cohort and 98.6% of patients in the nonpsychiatric diagnosis group said they would. There was no significant difference in average preoperative SANE scores (59.67 [no psych diagnosis] vs 61.70 [psych diagnosis]) or post-operative SANE scores (82.82 [no psych diagnosis] vs 81.06 [psych diagnosis]) between the two cohorts.
Conclusions: WALANT surgery was nearly as well tolerated in patients with a preexisting mental health diagnosis when compared to those without a preexisting diagnosis.
Clinical Relevance: Surgeons who are currently or potentially performing WALANT surgery should not rule out patients as eligible candidates because of a prior diagnosis of a mental health condition.

Wide-awake Local Anesthesia No Tourniquet (WALANT) is a surgical technique that combines local anesthesia and hemostatic agents to perform hand surgery without a need for sedation or a tourniquet.[1] It has demonstrated an excellent safety profile while decreasing health care costs and providing a high level of patient satisfaction.[2–4] From a patient experience standpoint, the avoidance of sedation allows patients to eat the day of surgery, drive themselves to and from their procedure, avoid common post-sedation side effects, such as fatigue or nausea, and be expeditiously discharged after their procedure.[1,5] Furthermore, WALANT avoids the risks of anesthesia and therefore allows surgeons to perform procedures on patients who may otherwise be deemed poor operative candidates.[1]

WALANT in hand surgery continues to increase in popularity in the United States and Canada, with approximately 88% of hand surgeons in Canada performing carpal tunnel releases (CTRs) with WALANT.[6,7] Although studies exist demonstrating the efficacy of WALANT, little research exists delineating which patients may be poor candidates. Given that patients are wide-awake during the surgery and subject to the sounds and experiences of the operating

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Corresponding author: Brian Ford, MD, Department of Orthopaedic Surgery, University of Connecticut Health Center, 120 Dowling Way, Farmington, CT 06032.
E-mail address: brford@uchc.edu (B. Ford).

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Table 1
Demographics of Patients Without a Psychiatric Diagnosis and Those With a Psychiatric Diagnosis

Demographics	No Psychiatric Diagnosis	Psychiatric Diagnosis	*P* Value
Number of patients	70	61	
Age (mean ±SD)	55.2 ± 13.6	50.1 ± 11.6	.052
BMI (mean ± SD)	31.7 ± 7.3	34.3 ± 10.8	.111
Female	62.9%	67.2%	.602
Active smoker	14.3%	14.8%	.939
Diabetes	18.6%	13.1%	.396
Significant cardiac comorbidities	10.0%	9.8%	.975

SD, standard deviation.

Table 2
Distribution of Psychiatric Diagnoses for the 61 Patients With a Past Medical History of a Mental Health Diagnosis

Psychiatric Diagnosis	Patients (N)
Generalized Anxiety Disorder (GAD) alone	13
Major Depressive Disorder (MDD) alone	15
GAD, MDD	18
GAD, MDD, bipolar disorder	3
Bipolar disorder	2
GAD, MDD, PTSD, borderline personality disorder	1
GAD, MDD, PTSD	1
GAD, MDD, ADHD	1
GAD, MDD, OCD, PTSD	1
GAD, MDD, OCD	1
GAD, bipolar disorder, PTSD	1
GAD, ADHD	1
MDD, OCD, ADHD	1
MDD, bipolar disorder, PTSD	1
PTSD	1

Table 3
Case Breakdown

Case Breakdown	N	Percentage Value
Single procedure	119	90.8%
Endoscopic carpal tunnel	47	35.9%
Open carpal tunnel	28	21.4%
Trigger finger	33	25.2%
Mass/ganglion excision	6	4.6%
Hardware removal	1	0.8%
Soft tissue release	2	1.5%
Tendon repair	2	1.5%
Combined procedures	12	9.2%
Bilateral carpal tunnel	1	0.8%
Carpal tunnel; trigger finger	7	5.3%
Carpal tunnel; cubital tunnel	1	0.8%
Mass/ganglion excision; soft tissue release	1	0.8%
Mass/ganglion excision; trigger finger	2	1.5%
Total	131	100.0%

room during an active surgery, one may theorize that some patients may consider it a stressful or anxiety-laden experience. Furthermore, one may wonder whether patients with a medical history of psychiatric comorbidities, such as anxiety, may have different patient experiences with WALANT. The purpose of this study was to delineate whether patients with a preexisting psychiatric diagnosis, such as generalized anxiety disorder (GAD), major depressive disorder (MDD), or bipolar disorder, had different patient experiences or postoperative outcomes when undergoing hand surgeries with WALANT compared to those without a psychiatric medical history. We hypothesized that patients with a medical history of a psychiatric diagnosis would have similar patient experiences and outcomes compared to patients without such a medical history.

Materials and Methods

The study was approved by the institutional review board. All procedures followed were performed in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Informed consent was obtained from all patients included in the study.

This is a retrospective review conducted to evaluate general experience and surgical outcomes in patients undergoing WALANT hand surgery during the enrollment period from August 2019 to October 2020. All patients were indicated for surgery by one of the two senior authors. All patients are offered and recommended WALANT unless the patient feels fearful after reviewing with the physicians how WALANT works.

Inclusion criteria included all patients >18 years of age indicated for CTR, trigger finger release, soft tissue mass excision, tendon repair, and/or hardware removal who were offered and accepted WALANT surgery. Exclusion criteria included <18 years of age, failure to complete a postoperative survey, non-English speaking patients, and patients undergoing revision surgery. No patients were required to complete a preoperative history and physical exam for surgical clearance, and no exclusions were made based upon medical comorbidities or American Society of Anesthesiologists class.

All surgeries were performed in the outpatient surgery center. Local anesthesia was administered by the senior authors approximately 30 minutes prior to their surgery. One senior author used a solution of 1% lidocaine with 1:100,000 epinephrine. The other senior author used a 1:1 ratio of 1% lidocaine with 1:100,000 epinephrine and 0.5% bupivacaine. The same volume of local anesthetic was provided by each participating surgeon with one exception. To assist in visualization and minimize disruption of soft tissues planes during open CTRs, one senior author used only 10 mL 1% lidocaine, while the other used 20 mL of a 1:1 ratio of 1% lidocaine and 0.5% bupivacaine. All patients were discharged on the same day. Postoperative pain control included recommendations for over-the-counter analgesics. In addition, if patients required postoperative narcotic pain medications, then 5 mg hydrocodone-325 mg acetaminophen was prescribed.

Patient experience surveys adapted from previously published surveys were administered at the first postoperative visit.[3,8,9] Patients were not incentivized to complete the survey. The survey included 10 patient experience questions that assessed preoperative and postoperative anxiety levels, pain during injection and procedure, postoperative pain, and whether patients would undergo WALANT again. All surveys were administered either by qualified medical assistants or advanced practice registered nurses. Surgeons were not present during survey administration to avoid potential response bias.

Baseline demographic data included age, sex, body mass index (BMI), smoking status, major medical comorbidities, and patients with a medical history of a mental health or psychiatric diagnosis.

Table 4
Survey Results Comparing Patients Without a Prior Psychiatric Diagnosis to Those With a Psychiatric Diagnosis

Survey Questions	No Psych Diagnosis	SD	95% CI	Psych Diagnosis	SD	95% CI	*P* Value
Q1: First WALANT procedure	75.7%			63.9%			0.140
Q2: Pre-op Anxiety (0–10, mean)	3.30	2.98	(2.60–4.00)	3.75	3.15	(2.94–4.56)	0.408
Q3: Anxiety about future WALANT (0–10, mean)	1.76	2.37	(1.21–2.31)	1.59	2.51	(0.95–2.23)	0.698
Q4: Pain of local injection prior to procedure (0–10, mean)	2.93	2.49	(2.35–3.51)	4.07	2.78	(3.36–4.78)	0.016
Q5: Pain during procedure (0–10, mean)	0.56	1.18	(0.28–0.74)	0.67	1.64	(0.25–1.09)	0.645
Q6: Pain after surgery (0–10, mean)	4.26	3.07	(3.54–4.98)	4.89	3.07	(4.10–5.68)	0.249
Q7: Pain medication taken (no of pills, mean)	3.41	4.30	(2.40–4.42)	4.52	4.53	(3.36–5.68)	0.175
Q8: Ate morning of procedure	70.0%			68.9%			0.880
Q9: Drove to surgery	40.0%			37.7%			0.790
Q10: Would have WALANT procedure again	98.6%			95.1%			0.250

CI, confidence interval; SD, standard deviation.

Significant cardiac comorbidities of interest included congestive heart failure (CHF), coronary artery disease (CAD), aortic stenosis, or atrial fibrillation. Mental health or psychiatric diagnoses observed from chart review included GAD, MDD, post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), bipolar disorder, and attention-deficit/hyperactivity disorder (ADHD).

Two main cohorts were delineated, including one cohort of patients with a preexisting mental health diagnosis and one cohort of patients without. The primary outcome measure was observed results in survey answers between these two cohorts. Secondary outcome measures included Single Assessment Numerical Evaluation (SANE) scores that were collected preoperatively and at the final postoperative appointment.

Data were entered into a Microsoft Excel spreadsheet version 16.16.21 (Microsoft Corporation, Redmond, Washington; 2016). All statistical analyses were performed using Statistical Package for the Social Sciences version 26 (IBM Corporation, Armonk, New York). Student *t* tests were used to compare data for continuous variables. In addition $\chi 2$ or Fisher exact tests were used to compare categorical values. The threshold for statistical significance was determined by a *P* value of less than or equal to 0.05.

Results

A total of 133 patients were identified, and two of these patients were excluded from analysis because of a lack of sufficient data. Of the 131 patients remaining for analysis, 61 of them had a past medical history of a psychiatric diagnosis (Table 1). Of these 61 patients with a mental health diagnosis, 13 patients had a diagnosis of GAD alone, 15 had a diagnosis of MDD alone, 18 had a diagnosis of both GAD and MDD, and the remainder had various combinations of GAD, MDD, bipolar disorder, PTSD, ADHD, and/or OCD (Table 2). When comparing those patients with a mental health diagnosis to those without, there were no significant differences in age (50.95 vs 55.20 years; $P = .052$), BMI (34.26 vs 31.70; $P = .111$), or sex (67.2% vs 62.9% female; $P = .602$) (Table 1). Furthermore, there were no significant differences in the rate of active smokers, diabetes, or significant cardiac comorbidities between the two cohorts. The distribution of hand cases performed is shown in Table 3, which demonstrates that 35.9% of patients underwent endoscopic CTR, 21.4% of patients underwent open CTR, and 25.2% underwent trigger finger release. There were no patients who did not tolerate WALANT surgery and required conversion to traditional anesthesia or sedation.

When observing the survey results between patients without a mental health diagnosis and those with a mental health diagnosis (Table 4), the only statistically significant finding was that patients with a mental health diagnosis had a higher average pain score during the local injection prior to the procedure (4.07 vs 2.93; $P = .016$). However, there was no significant difference between patients with a psychiatric diagnosis and those without with regard to pain during the procedure (0.67 vs 0.56; $P = .645$) or pain after surgery (4.89 vs 4.26; $P = .249$) (Table 4). Additionally, no differences were found in the amount of 5 mg hydrocodone-325 mg acetaminophen pills taken after surgery between the psychiatric group (4.52) versus the nonpsychiatric group (3.41; $P = .175$) (Table 4). Furthermore, there was no significant difference in rates of preoperative anxiety between the two cohorts, with patients with a psychiatric diagnosis reporting on average a 3.75 (0–10) preoperative anxiety score compared to 3.30 in those without a psychiatric diagnosis ($P = .408$). When asked if they would have a WALANT procedure again, a resounding 95.1% of those with a psychiatric diagnosis and 98.6% without a psychiatric diagnosis said that they would ($P = .250$).

When comparing the outcome scores of the two cohorts, there was no significant difference in preoperative SANE scores (59.67: no psychiatric diagnosis vs 61.70: psychiatric diagnosis; $P = .636$) (Table 5). Additionally, there was no significant difference when comparing postoperative SANE scores, as patients with a psychiatric diagnosis had an average postoperative SANE score of 81.06 compared to 82.82 in those without a psychiatric diagnosis ($P = .588$) (Table 6).

Discussion

Patient anxiety and comfort level are potential sources of trepidation in hand surgeons indicating patients for WALANT, and one may theorize that this may be of added concern in patients with a preexisting mental health condition. We ultimately found a similarly high level of patient satisfaction between patients with a psychiatric diagnosis compared to those without, with 95.1% of patients with a psychiatric diagnosis reporting they would undergo WALANT again. Our findings suggest that a preexisting psychiatric diagnosis should not be a deterrent to WALANT, as these patients can have similarly satisfying patient experiences and outcomes.

The only statistically significant difference in the two cohorts was the rate of pain during preoperative injection, with patients with a mental health diagnosis reporting higher rates of pain. A somewhat similar finding has been born out in literature on dental patients undergoing local injections, with patients with higher rates of preprocedure anxiety reporting higher rates of pain.[10,11] Several studies have suggested that anxiety or fear before a local injection can incur an attentional bias toward that painful stimuli, and it is this attention bias that subsequently exacerbates one's perception of pain.[12,13] If this were to be fully realized in our study, then the patients with a mental health diagnosis would not just have a higher rate of injection pain but also a higher rate of preoperative anxiety, which interestingly we did not observe.

Table 5
Preoperative SANE Scores for patients With and Without a Mental Health Diagnosis

	Average Preoperative SANE Score	SD	95% CI	*P* Value
No psychiatric diagnosis	59.7	21.4	(54.6–64.7)	0.636
Psychiatric diagnosis	61.7	24.3	(56.0–67.4)	

CI, confidence interval; SD, standard deviation.

Table 6
Postoperative SANE Scores for Patients With and Without a Mental Health Diagnosis and Average Postoperative Day Scores Were Obtained

	Average POD SANE Score Obtained	Average Postoperative SANE Score	SD	95% CI	*P* Value
No psychiatric diagnosis	47.3 ± 40.3	82.8	16.1	(79.0–86.6)	0.588
Psychiatric diagnosis	48.0 ± 32.0	81.1	17.1	(77.0–85.0)	

CI, confidence interval; POD, postoperative day; SD, standard deviation.

There is a growing body of orthopedic literature suggesting that mental health diagnosis can influence patient-reported outcomes in patient either undergoing or recovering from orthopedic procedures.[14,15] To our knowledge, this is the first study of its type exploring mental health diagnosis as a possible predictor of patient satisfaction, anxiety, or pain in patients specifically undergoing WALANT. However, several studies do exist that examine low anxiety and high satisfaction rates in isolation in patients undergoing WALANT. In a prospective study comparing 100 CTRs performed under WALANT to 100 CTRs performed with intravenous sedation, Davison et al[3] found a lower rate of preoperative anxiety in the wide-awake cohort but no difference in postoperative anxiety. They additionally found that 93% of wide-awake patients would choose local anesthesia only again and that 93% of sedated patients would choose sedation again. Furthermore, several studies have explored depression as a predictor of worse postoperative pain and outcomes in orthopedic surgery, including hand surgery.[16–19] In a study of 120 consecutive patients undergoing hand surgery, Vranceanu et al[17] observed the presence of depression to be associated with higher rates of pain at time of postoperative suture removal as well as worse postoperative Disabilities of the Arm, Shoulder, and Hand scores. In a study of 82 patients who underwent open CTR, Lozano Calderon et al[18] found that depression portended worse postoperative functional outcome scores with higher rates of perceived disability. London et al[19] compared the outcomes between 50 patients with depression and 206 patients without being treated for atraumatic hand conditions. The study revealed a significantly worse final hand rating in the depression group after 3 months; however, the absolute improvement over baseline was similar between the two cohorts. Our intention was to expand on some of this prior literature and explore the specific implications the presence of a mental health diagnosis may specifically have on WALANT hand surgery.

Several limitations exist in our study, including the inherent limitations of any retrospective study. One additional potential limitation is that this study only included patients who were willing to undergo WALANT. There may be the presence of selection bias as one may wonder whether there might be a higher rate of patients that opt for WALANT or are deemed acceptable candidates based on the absence or presence of a mental health diagnosis. This being said, all patients are offered and recommended WALANT unless the patient feels fearful after the surgeon reviews how WALANT works. Furthermore, the two participating surgeons report from their experience that the vast majority of their patients elect for WALANT when offered both options. Additionally, our decision to combine all patients with presence of at least one psychiatric diagnosis into the same cohort instead of a subgroup analysis might limit our potential to assess whether there are any specific mental health diagnoses or combinations thereof that would lead to different results. We felt our study would be underpowered to pursue such a subgroup analysis and thus performed the study as specified. Furthermore, another limitation exists in the size of our patient sample, which may not fully represent the entire population involved. Further studies of similar design assessing larger patient populations are likely warranted. Potential confounders also exist in factors that potentially contributed to patient satisfaction, as oftentimes within medical care patient satisfaction can be multifactorial and include variables, such as how expeditiously patients were treated or how patients were treated by nursing and nonsurgeon staff.[20] Despite these limitations, we believe our results to be valid.

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