Weighted Blankets May Help Reduce Preoperative Anxiety During Mohs Micrographic Surgery

Jack Lee, MD; Diem-Phuong D. Dao, MD; Mark A. Russell, MD; Darren J. Guffey, MD

PRACTICE **POINTS**

- Preoperative anxiety in patients during Mohs micrographic surgery (MMS) may increase intraoperative bleeding, complication rates, and recovery times.
- Using weighted blankets may reduce anxiety in patients undergoing MMS of the head and neck.

To the Editor:

Patients with nonmelanoma skin cancers exhibit high quality-of-life satisfaction after treatment with Mohs micrographic surgery (MMS) or excision.[1,2] However, perioperative anxiety in patients undergoing MMS is common, especially during the immediate preoperative period.[3] Anxiety activates the sympathetic nervous system, resulting in physiologic changes such as tachycardia and hypertension.[4,5] These sequelae may not only increase patient distress but also increase intraoperative bleeding, complication rates, and recovery times.[4,5] Thus, the preoperative period represents a critical window for interventions aimed at reducing anxiety. Anxiety peaks during the perioperative period for a myriad of reasons, including anticipation of pain or potential complications. Enhancing patient comfort and well-being during the procedure may help reduce negative emotional sequelae, alleviate fear during procedures, and increase patient satisfaction.[3]

Weighted blankets (WBs) frequently are utilized in occupational and physical therapy as a deep pressure stimulation tool to alleviate anxiety by mimicking the experience of being massaged or swaddled.[6] Deep pressure tools increase parasympathetic tone, help reduce anxiety, and provide a calming effect.[7,8] Nonhospitalized individuals were more relaxed during mental health evaluations when using a WB, and deep pressure tools have frequently been used to calm individuals with autism spectrum disorders or attention-deficit/hyperactivity disorders.[6] Furthermore, WBs have successfully been used to reduce anxiety in mental health care settings, as well as during chemotherapy infusions.[6,9] The literature is sparse regarding the use of WB in the perioperative setting. Potential benefit has been demonstrated in the setting of dental cleanings and wisdom teeth extractions.[7,8] In the current study, we investigated whether use of a WB could reduce preoperative anxiety in the setting of MMS.

Institutional review board approval was obtained from the University of Virginia (Charlottesville, Virginia), and adult patients undergoing MMS to the head or neck were recruited to participate in a single-blind randomized controlled trial in the spring of 2023. Patients undergoing MMS on other areas of the body were excluded because the placement of the WB could interfere with the procedure. Other exclusion criteria included pregnancy, dementia, or current treatment with an anxiolytic medication.

Twenty-seven patients were included in the study, and informed consent was obtained. Patients were randomized to use a WB or standard hospital towel (control). The medical-grade WBs weighed 8.5 pounds, while the cotton hospital towels weighed less than 1 pound. The WBs were cleaned in between patients with standard germicidal disposable wipes.

Patient data were collected from electronic medical records including age, sex, weight, history of prior MMS, and current use of antihypertensives and/or beta-blockers.

Drs. Lee and Russell are from the Department of Dermatology, University of Virginia, Charlottesville. Dr. Dao is from the School of Medicine, Virginia Commonwealth University, Richmond. Dr. Guffey is from Commonwealth Dermatology, Richmond.

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Correspondence: Diem-Phuong D. Dao, MD, School of Medicine, Virginia Commonwealth University, 1201 E Marshall St, Richmond, VA, 23298 (daopd@vcu.edu).

The eTable is available in the Appendix online at www.mdedge.com/dermatology.

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Data also were collected on the presence of anxiety disorders, major depression, fibromyalgia, tobacco and alcohol use, hyperthyroidism, hyperhidrosis, cardiac arrhythmias (including atrial fibrillation), chronic obstructive pulmonary disease, asthma, coronary artery disease, diabetes mellitus, peripheral neuropathy, and menopausal symptoms.

During the procedure, anxiety was monitored using the State-Trait Anxiety Inventory (STAI) Form Y-1, the visual analogue scale for anxiety (VAS-A), and vital signs including heart rate, blood pressure, and respiratory rate. Vital signs were evaluated by nursing staff with the patient sitting up and the WB or hospital towel removed. Using these assessments, anxiety was measured at 3 different timepoints: upon arrival to the clinic (timepoint A), after the patient rested in a reclined beach-chair position with the WB or hospital towel placed over them for 10 minutes before administration of local anesthetic and starting the procedure (timepoint B), and after the first MMS stage was taken (timepoint C).

A power analysis was not completed due to a lack of previous studies on the use of WBs during MMS. Group means were analyzed using two-tailed *t*-tests and one-way analysis of variance. A *P* value of .05 indicated statistical significance.

Fourteen patients were randomized to the WB group and 13 were randomized to the control group. Patient demographics are outlined in the eTable. In the WB group, mean STAI scores progressively decreased at each timepoint (A: 15.3, B: 13.6, C: 12.7) and mean VAS-A scores followed a similar trend (A: 24.2, B: 19.3, C: 10.5). In the control group, the mean STAI scores remained stable at timepoints A and B (17.7) and then decreased at timepoint C (14.8). The mean VAS-A scores in the control group followed a similar pattern, remaining stable at timepoints A (22.9) and B (22.8) and then decreasing at timepoint C (14.4). These changes were not statistically significant.

Mean vital signs for both the WB and control groups were relatively stable across all timepoints, although they tended to decrease by timepoint C. In the WB group, mean heart rates were 69, 69, and 67 beats per minute at timepoints A, B, and C, respectively. Mean systolic blood pressures were 137 mm Hg, 138 mm Hg, and 136 mm Hg and mean diastolic pressures were 71 mm Hg, 68 mm Hg, and 66 mm Hg at timepoints A, B, and C, respectively. Mean respiratory rates were 20, 19, and 18 breaths per minute at timepoints A, B, and C, respectively. In the control group, mean heart rates were 70, 69, and 68 beats per minute across timepoints A, B, and C, respectively. Mean systolic blood pressures were 137 mm Hg, 138 mm Hg, and 133 mm Hg and mean diastolic pressures were 71 mm Hg, 74 mm Hg, and 68 mm Hg at timepoints A, B, and C, respectively. Mean respiratory rates were 19, 18, and 18 breaths per minute at timepoints A, B, and C, respectively. These changes were not statistically significant.

Our pilot study examined the effects of using a WB to alleviate preoperative anxiety during MMS. Our results suggest that WBs may modestly improve subjective anxiety immediately prior to undergoing MMS. Mean STAI and VAS-A scores decreased from timepoint A to timepoint B in the WB group vs the control group in which these scores remained stable. Although our study was not powered to determine statistical differences and significance was not reached, our results suggest a favorable trend in decreased anxiety scores. Our analysis was limited by a small sample size; therefore, additional larger-scale studies will be needed to confirm this trend.

Our results are broadly consistent with earlier studies that found improvement in physiologic proxies of anxiety with the use of WBs during chemotherapy infusions, dental procedures, and acute inpatient mental health hospitalizations.[7-10] During periods of high anxiety, use of WBs shifts the autonomic nervous system from a sympathetic to a parasympathetic state, as demonstrated by increased high-frequency heart rate variability, a marker of parasympathetic activity.[6,11] While the exact mechanism of how WBs and other deep pressure stimulation tools affect high-frequency heart rate variability is unclear, one study showed that patients undergoing dental extractions were better equipped when using deep pressure stimulation tools to utilize calming techniques and regulate stress.[12] The use of WBs and other deep pressure stimulation tools may extend beyond the perioperative setting and also may be an effective tool for clinicians in other settings (eg, clinic visits, physical examinations).

In our study, all participants demonstrated the greatest reduction in anxiety at timepoint C after the first MMS stage, likely related to patients relaxing more after knowing what to expect from the surgery; this also may have been reflected somewhat in the slight downward trend noted in vital signs across both study groups. One concern regarding WB use in surgical settings is whether the added pressure could trigger unfavorable circulatory effects, such as elevated blood pressure. In our study, with the exception of diastolic blood pressure, vital signs appeared unaffected by the type of blanket used and remained relatively stable from timepoint A to timepoint B and decreased at timepoint C. Diastolic blood pressure in the WB group decreased from timepoint A to timepoint B, then decreased further from timepoint B to timepoint C. This mirrored the decreasing STAI score trend, compared to the control group who increased from timepoint A to timepoint B and reached a nadir at timepoint C. Consistent with prior WB studies, there were no adverse effects from WBs, including adverse impacts on vital signs.[6,9]

The original recruitment goal was not met due to staffing issues related to the COVID-19 pandemic, and subgroup analyses were deferred as a result of sample size limitations. It is possible that the WB intervention may have a larger impact on subpopulations more prone to perioperative anxiety (eg, patients undergoing MMS for the first time). However, the results of our pilot study suggest a beneficial effect from the use of WBs. While these preliminary data are promising, additional studies in the perioperative setting are needed to more accurately determine the clinical utility of WBs during MMS and other procedures.

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APPENDIX

eTABLE. Patient Demographics

	Weighted Blanket Group (n=14)	Control Group (n=13)
Mean age, y	71.3	71.7
Sex, n (%)		
Male	9 (64.3)	8 (61.5)
Female	5 (35.7)	5 (38.5)
Mean weight, lb	182.4	166.5
History of MMS		
Yes	9 (64.3)	9 (69.2)
No	5 (35.7)	4 (30.8)
Current antihypertensive use		
Yes	8 (57.1)	6 (46.2)
No	6 (42.9)	7 (53.8)
Current beta-blocker use		
Yes	4 (28.6)	6 (46.2)
No	10 (71.4)	7 (53.8)
Anxiety disorder		
Yes	2 (14.3)	3 (23.1)
No	12 (85.7)	10 (76.9)
Major depression		
Yes	3 (21.4)	4 (30.8)
No	11 (78.6)	9 (69.2)
Fibromyalgia		
Yes	0 (0.0)	0 (0.0)
No	14 (100.0)	13 (100.0)
Tobacco use within past year		
Yes	2 (14.3)	1 (7.7)
No	12 (85.7)	12 (92.3)
Weekly alcohol use		
Yes	6 (42.9)	7 (53.8)
No	8 (57.1)	6 (46.2)

Abbreviation: MMS, Mohs micrographic surgery.