Pain in dermatologic surgery: A prospective quantitative study

To the Editor: The number of surgical procedures in dermatology has increased substantially during the last decades.[1] Intraoperative pain is still scantly reviewed in dermatologic surgery.

The objective of this prospective observational study was to assess the prevalence and degree of intraoperative pain in outpatient dermatologic surgery and to identify patient and treatment characteristics associated with an increased risk of severe intraoperative pain. The study was conducted at the Dermatology Department of the Maastricht University Medical Centre+, Maastricht, The Netherlands, and approved by the center's medical ethics board. Between October 1, 2016, and January 31, 2017, patients undergoing a surgical treatment (Mohs or conventional excision) under local anesthesia were asked to complete a pain assessment questionnaire after giving written informed consent. Patients rated their pain using the pain intensity numeric rating scale (PI-NRS)-11 (with 0 indicating no pain and 10 indicating the worst pain imaginable).[2] Local anesthesia consisted of a 10:1 mixture of lidocaine 1% with epinephrine 1:100,000 and sodium bicarbonate 8.4%. Patients undergoing Mohs surgery had additional bupivacaine 0.5% after each stage. Dermatology surgeons and residents were educated on pain-minimizing techniques in local anesthesia before the start of the study.[3]

A total of 199 patients were included, 163 (81.9%) with 1 and 36 (18.1%) with more than 1 surgical site. The baseline characteristics of patients with 1 site are presented in Table I. In total, 169 of 199 (84.9%) patients reported pain (PI-NRS, ≥1) during injection of local anesthetics, with the majority of scores on the lower end of the spectrum (Table I). Overall, 27 of 199 (13.6%) reported severe pain (PI-NRS, ≥6). During surgery, 77 of 199 patients (38.7%) reported pain (PI-NRS, ≥1), with predominantly low scores of 1 or 2. Severe pain was reported by 8.5%. The risk of severe intraoperative pain was significantly increased in patients with high pain expectation, preference for sedation, and PI-NRS score of ≥6 during anesthesia (Table II). Furthermore, the relative risk of severe pain was especially high in patients with melanoma requiring a deep excision compared to patients treated with a superficial excision for nonmelanoma skin cancer (relative risk, 21.7).

In general surgery, the association of pain expectation and anxiety with postoperative pain has previously been reported.[4] The explanation for the observed high risk of severe pain in patients with melanoma may be that in our center, these patients

Table I. Patient and treatment characteristics of patients with 1 surgical site

Patient/treatment characteristic	Value (n = 163)*
Sex, n (%)	
Male	84 (51.5)
Female	79 (48.5)
Age, y, mean ± SD	67.1 ± 14.6
Location, n (%)	
Nose	29 (17.8)
Ear	16 (9.8)
Lip	5 (3.1)
Periocular	9 (5.5)
Frontotemporal	13 (8.0)
Cheek	11 (6.7)
Skull	15 (9.2)
Neck	3 (1.8)
Trunk	30 (18.4)
Extremities	32 (19.6)
Defect size, mm, mean ± SD	26 ± 17.2
Type of surgery, n (%)	
Mohs surgery	42 (25.8)
Conventional excision, surgical level	
Subcutaneous fat	92 (56.4)
Subgaleal, periosteum, or cartilage	12 (7.4)
Muscular fascia	17 (10.4)
Diagnosis, n (%)	
Nonmelanoma skin cancer	140 (85.9)
Melanoma	12 (7.4)
Benign tumor	11 (6.7)
Pain scores during local anesthesia, n (%)	
0	26 (16.0)
1	33 (20.2)
2	34 (20.9)
3	22 (13.5)
4	14 (8.6)
5	14 (8.6)
6	4 (2.5)
7	5 (3.1)
8	8 (4.9)
9	1 (0.6)
10	2 (1.2)
Pain scores during surgery, n (%)	
0	103 (63.2)
1	19 (11.7)
2	12 (7.4)
3	5 (3.1)
4	8 (4.9)
5	2 (1.2)
6	5 (3.1)
7	3 (1.8)
8	2 (1.2)
9	1 (0.6)
10	3 (1.8)

SD, Standard deviation.

*Only pain scores of patients with 1 lesion are reported. The distribution of pain scores in patients with more than 1 lesion was similar (results not shown).

Table II. Relative risks (RR) with 95% confidence intervals (CI) of severe pain associated with patient, tumor, and treatment characteristics

Characteristics	n (n = 163)	PI-NRS, n (%)		RR (95% CI)	*P* value*
		≥6	<6		
Sex					
Male	84	6 (7.1)	78 (92.9)	ref	
Female	79	8 (10.1)	71 (89.9)	1.42 (0.51-3.90)	.689
Age, y					
0-70	86	9 (10.5)	77 (89.5)	ref	
>70	77	5 (6.5)	72 (93.5)	0.62 (0.22-1.77)	.533
Pain expectation					
0-5	133	8 (6.0)	125 (94.0)	ref	
6-10	30	6 (20.0)	24 (80.0)	3.33 (1.25-8.88)	.030
Sedation preference					
No	145	6 (4.1)	139 (95.9)	ref	
Yes	18	8 (44.4)	10 (55.6)	10.74 (4.20-27.45)	<.001
Pain score anesthesia					
0-5	143	6 (4.2)	137 (95.8)	ref	
6-10	20	8 (40.0)	12 (60.0)	9.53 (3.69-24.64)	<.001
Defect size, mm					
0-20	59	6 (10.2)	53 (89.8)	ref	
>20	104	8 (7.7)	96 (92.3)	0.76 (0.28-2.01)	.801
Diagnosis					
NMSC	140	8 (5.7)	132 (94.2)	ref	
Benign	11	1 (9.1)	10 (90.9)	1.60 (0.22-11.60)	.635
Melanoma	12	5 (41.7)	7 (58.3)	7.30 (2.82-18.84)	.001
Diagnosis and excision type					
NMSC, superficial	76	2 (2.6)	74 (97.4)	ref	
NMSC, Mohs	42	4 (9.5)	38 (90.5)	3.62 (0.69-18.94)	.139
NMSC, deep†	22	2 (9.1)	20 (90.9)	3.46 (0.52-23.13)	.251
Benign, superficial	11	1 (9.1)	10 (90.9)	3.46 (0.34-35)	.378
Benign, deep†	0	—	—	—	—
Melanoma, superficial (diagnostic)	5	1 (20.0)	4 (80.0)	7.6 (0.82-70.2)	.185
Melanoma, deep† (therapeutic)	7	4 (57.1)	3 (42.9)	21.71 (4.80-98.34)	<.001
Re-excision					
No	146	8 (5.5)	138 (94.5)	ref	
Yes, melanoma	7	4 (57.1)	3 (42.9)	10.43 (4.11-26.44)	<.001
Yes, other	10	2 (20.0)	8 (80.0)	3.65 (0.89-14.96)	.145

CI, Confidence interval; *NMSC,* nonmelanoma skin cancer; *PI-NRS,* pain intensity numeric rating scale; *ref,* reference; *RR,* relative risk.
**P* values were derived from the Yates corrected chi-square test or from the mid-*P* exact test in the case of at least 1 expected value (row total × column total/grand total) of less than 5.
†*Deep* includes all conventional excisions beyond the level of the subcutis (muscular fascia, subgaleal, periosteum, or cartilage).

receive surgery in the short term and may have high anxiety levels. The hypothesis that anxiety contributes to higher risk of severe pain could not be evaluated in this study because we did not use a validated anxiety scale.

Maastricht University Medical Centre+ is an academic hospital with a regional function and serves a broad spectrum of patients having dermatologic surgery, but as this is a single-center study, generalizability of the results may be a concern.

In conclusion, most patients report only minor pain during dermatologic surgery under local anesthesia. A small group experiences severe intraoperative pain. Awareness of risk factors for severe pain helps improve pain management and selection of candidates for pain-reducing interventions. High-risk patients might benefit from conscious sedation (limited to the hospital setting) or oral anxiolytics.[5]

Eva van Loo, MD,[a,b] Gabrielle Westerveld, MD,[c] Patty J. Nelemans, PhD,[d] and Nicole W. J. Kelleners-Smeets, MD, PhD[a,b]

From the Department of Dermatology, Maastricht University Medical Centre+[a]; School for Oncology & Developmental Biology, Maastricht University[b]; Maastricht University Faculty of Health, Medicine, and Life Sciences[c]; and

Department of Epidemiology, Maastricht University Medical Centre+, Maastricht, The Netherlands.[d]

Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Reviewed and approved by medical ethical review committee of Maastricht University Medical Centre+ (METC 16-4-172).

Reprints are not available from the authors.

Correspondence to: Dr Eva van Loo, Maastricht University Medical Centre+, Department of Dermatology, PO Box 5800, 6202 AZ Maastricht, The Netherlands

E-mail: eva.van.loo@mumc.nl

REFERENCES

1. Ahn CS, Davis SA, Dabade TS, Williford PM, Feldman SR. Noncosmetic skin-related procedures performed in the United States: an analysis of national ambulatory medical care survey data from 1995 to 2010. *Dermatol Surg*. 2013;39:1912-1921.
2. Breivik H, Borchgrevink PC, Allen SM, et al. Assessment of pain. *Br J Anaesth*. 2008;101:17-24.
3. Glass JS, Hardy CL, Meeks NM, Carroll BT. Acute pain management in dermatology: risk assessment and treatment. *J Am Acad Dermatol*. 2015;73:543-560.
4. Sobol-Kwapinska M, Babel P, Plotek W, Stelcer B. Psychological correlates of acute postsurgical pain: a systematic review and meta-analysis. *Eur J Pain*. 2016;20:1573-1586.
5. Ravitskiy L, Phillips PK, Roenigk RK, et al. The use of oral midazolam for perioperative anxiolysis of healthy patients undergoing Mohs surgery: conclusions from randomized controlled and prospective studies. *J Am Acad Dermatol*. 2011;64:310-322.

https://doi.org/10.1016/j.jaad.2020.05.019

Worsening skin damage in patients with cutaneous lupus erythematosus may predict development of systemic lupus erythematosus

To the Editor: Up to 20% of patients with cutaneous lupus erythematosus (CLE) will develop systemic lupus erythematosus (SLE).[1,2] Prior studies have compared patient characteristics and clinical findings at baseline to identify risk factors for developing SLE.[2-4] However, variables that change over time, such as skin disease severity, have not been studied. Our study objective was to identify variable risk factors that predispose patients with CLE to develop SLE.

We performed a retrospective cohort study of patients with CLE seen in outpatient dermatology clinics of the University of Texas Southwestern Medical Center and Parkland Health and Hospital System between December 2008 and December 2019. Exclusion criteria included SLE diagnosis at initial visit, coexisting autoimmune disease, and less than 6 months of follow-up. Patient demographics, Cutaneous Lupus Activity and Severity Index (CLASI) scores, Physician Global Assessment (PGA) scores, and American College of Rheumatology (ACR) SLE diagnostic criteria were collected. Baseline characteristics were compared using Fisher's exact test or Wilcoxon rank sum test between patients with CLE only and patients who progressed from CLE to SLE. Longitudinally, PGA scores and SLE diagnostic criteria at each 6-month interval from baseline to year 3 and each 12-month interval afterward were compared using Wilcoxon rank sum tests or *t* tests. To compare CLASI activity and damage trends over time, the average change scores of CLASI activity and damage or the mean of differences between scores from baseline to each follow-up visit[5] was calculated and analyzed via Fisher's exact test.

Of the 69 patients meeting all criteria, 57 (82.6%) remained with CLE (CLE only), and 12 (17.4%) progressed to SLE (CLE to SLE). At baseline, CLE-to-SLE patients had greater ACR SLE diagnostic criteria, immunologic disorders more frequently, worse PGA overall skin scores, and more generalized DLE than patients with CLE (Table I). Longitudinally, more CLE-to-SLE patients (41.7%) showed worsened skin damage than patients with CLE only (15.8%) ($P = .04$), based on average change scores for CLASI damage (Fig 1). CLE-to-SLE patients had worse PGA overall skin scores at month 6 and year 3 ($P = .01$), more ACR SLE criteria ($P < .05$), more immunologic disorder ($P = .01$), and higher frequency of taking prednisone 10 mg/d or more ($P = .01$). No statistical difference existed for CLASI activity average change scores between groups.

We found that more CLE-to-SLE patients showed worsened CLASI damage scores over time than patients with CLE only. Skin damage can accumulate from prior episodes of high skin disease activity. Although CLE-to-SLE patients did not more frequently show worsening disease activity trends than patients with CLE only, many CLE-to-SLE patients had waxing and waning skin activity courses that likely contributed to their higher skin damage scores. Although we suspect that CLE flares may be an indicator of SLE progression, the lack of a common definition of a CLE flare prevented us from measuring this. Small patient sample size, treatment differences, and limited follow-up duration were additional study limitations. Nonetheless, we have shown that information from baseline and follow-up visits can comprehensively identify risk factors in CLE-to-SLE patients. Earlier