



# Comparison of Patient and Surgeon Assessments of Pain in Oral and Maxillofacial Surgery

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**ABSTRACT** Pain perception is a physical sensation interpreted in the light of experience and is influenced by a great number of interacting factors. Clinicians are constantly required to combine subjective and objective information to determine optimal treatment of pain. In this study, the authors prospectively compare patients' subjective complaints of pain using the visual analog scale to the surgeons' assessment of pain using standard history and physical examination findings.

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Pain is one of the most common reasons why many individuals seek medical care. It is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."<sup>1</sup> Pain perception is a physical sensation interpreted in the light of experience and is influenced by a great number of interacting physical, mental, biological, physiological, psychological, social, cultural, and emotional factors. Each individual learns the application of the word through experiences related to injury early in life.<sup>1</sup> The response to pain is very variable both subjectively, behaviorally (crying, yelling, teeth clenching, wincing), and physiologically through various individual ranges of

sympathetic nervous system manifestations (hypertension, tachycardia, nausea, pupillary dilation, pallor, perspiration).

A remarkable aspect of pain perception is the extreme variability of reactions that it evokes. Many factors affect the perception of pain. Comparison of pain perception in civilians and soldiers showed that 83 percent of civilians about to undergo major surgery asked for pain killers, but only 32 percent of wounded soldiers requested pain medications.<sup>2</sup> Stress plays a key role in pain perception. Stress-induced analgesia is the reduction of pain that results when people are under stress.<sup>3</sup> This is partially explained by the effect of the sympathetic nervous system on pain. Anxiety can also have a profound effect. The greater the anxiety of the

individual, the more likely that the response to a stimulus is interpreted as painful.<sup>4</sup> Additionally, the pain threshold is lowered with increasing anxiety.<sup>4</sup>

The perception of pain can also be affected by individual cognitive and psychological factors. In one study, volunteer subjects received a series of increasingly intense electric shocks while in the presence of experimental models who appeared to be getting similar intensity electric shocks. Some experimental models reacted tolerantly to the shocks while others reacted intolerantly. They found that subjects reported less pain and accepted more intense shocks when in the presence of a tolerant model.<sup>5</sup>

The influence of gender on pain assessment and management was reviewed by Nevin.<sup>6</sup> Her findings suggest a trend toward women reporting a lower pain threshold and tolerance and higher pain intensity than men. A more recent study by Cepeda in 2003 looked at gender differences in pain perception in a prospective cohort including 423 women and 277 males emerging from general anesthesia after surgical procedures. The level of pain was reported on a Visual Analog Scale, VAS. Equal doses of morphine were administered until the VAS rating was  $\leq 4$ . They concluded that women experience more pain and require more morphine than men to achieve a similar degree of analgesia.<sup>7</sup>

Todd reviewed pain assessment and ethnicity and found very inconsistent results in the literature.<sup>8</sup> The need for accurate and specific categorization of ethnicity and measurement of variables such as socioeconomic status and acculturation, in addition to ethnicity was highlighted. In a previous study, Todd looked at the effects of ethnicity on physician estimates of pain severity in patients with isolated extremity trauma.<sup>9</sup> It was concluded

that the physicians' ability to assess pain severity does not differ for Hispanic and non-Hispanic white patients.

Previous emergency room studies have suggested that physicians need to be more attentive to their patients' analgesic needs.<sup>10-12</sup> In a study comparing patient and practitioner assessments of pain from commonly performed emergency department procedures, it was found that practitioners and patients easily identified painful procedures. However the correla-



tion between patient and practitioner pain assessments was highly variable.<sup>12</sup> They suggested that practitioners need to be more attentive to anesthetic needs of patients before performing painful procedures. Patient and physician evaluations of outcome after total hip arthroplasty was studied by Lieberman.<sup>13</sup> Their study highlighted a discrepancy between patient and physician evaluations that was greater when the patient was not satisfied with the outcome.

Oral and maxillofacial surgeons commonly diagnose and treat patients with head and neck pain. The decision to treat pain is based on subjective and

objective findings and can present as a great challenge. Despite the availability of many different pharmacological agents, postoperative pain remains a negative and feared consequence of surgery. This may serve as a deterrent for many patients to seek a necessary surgical procedure. Until better methods are available to quantify pain, clinicians have to rely on subjective parameters and their perception of the patient's response to their physical examination techniques. A patient's vital signs are monitored routinely in hospital wards and clinics. Any deviation of the vital signs from the expected parameters triggers an investigation or intervention by the treating healthcare personnel. A subjective change in the patient's report of pain may also trigger an intervention. The assessment of pain has been introduced as the fifth "vital" sign in addition to the traditional four (temperature, pulse, blood pressure, and respiratory rate).<sup>14</sup> The VAS is a frequently used method to quantify pain severity in pain research.<sup>15</sup> This is a simple tool that can be easily applied by physicians and research assistants, providing reproducible results.<sup>15</sup> It has been validated for use in adults and children as young as age 5.<sup>16,17</sup>

There are several possible explanations for the undertreatment of pain: (1) pain is subjective not objective; (2) the causal basis of pain is often poorly understood; (3) pain is regarded as a symptom, not a disease; (4) there is frequently no definitive treatment for pain; (5) pain does not always fit a scientific model<sup>18</sup>; (6) clinicians face legal and regulatory pressures to restrict the use of narcotics; (7) concerns of side effects and development of tolerance and abuse (narcotics); (8) doctors may assume that patients are overemphasizing their pain level; and (9) adequate funding for pain control is not available

via third-party payers.<sup>18</sup> Undertreatment of pain can have serious consequences to the patients, their families, and society. A decrease in the quality of life and productivity, deterioration of social interactions, increased cost of treatment, prolonged recovery time and the potential for developing chronic pain syndromes. A first step for better treatment of patients' pain is an improved perception of their level of pain.

The objective of this study was to compare the patients' perception of their pain to the surgeons' impression of the patient's pain based on standard history and physical examination techniques during routine consultations, preoperative and postoperative visits at the Emory Clinic, Division of Oral and Maxillofacial Surgery.

## Materials and Method

All patients over the age 18 presenting to the oral and maxillofacial surgery clinic at the Emory Clinic in Atlanta for consultation, preoperative or postoperative assessment, were enrolled prospectively for comparison of patient and clinician assessment of pain. Data was collected on 12 clinic days, only when the first author (Bagheri) was available to consistently document the VAS scores. Upon arrival to the clinic, patients were asked by the same investigator to rate their level of pain on a 10 cm VAS. Subsequently, standard history and physical examination techniques were used by faculty or resident surgeons to conduct routine patient evaluations. The evaluating surgeons were asked by the same author to rate his/her perception of the patient's pain on a separate 10 cm VAS. All evaluating surgeons were blinded to the initial pre-evaluation VAS pain rating. The following parameters were also collected: age, gender, race, and the presence of a patient companion in the examination room.

Patients presented to the clinic for a wide range of clinical and surgical

conditions at various stages of treatment or consultation. The patients mostly presented for dentoalveolar surgery, disorders of the temporomandibular joint, dentofacial deformities, head and neck infections, obstructive sleep apnea, and other pathologic conditions of the oral and maxillofacial region.

## Results

One-hundred twenty-seven patients (N=127) (average age 37.1, range 18-65) presenting to the Emory Clinic OMFS unit were enrolled in the study. **TABLE 1** outlines the demographics of the study group. Patients were enrolled consecutively when the first author was available to conduct the preoperative VAS assessment and document the surgeon's postexamination VAS score. Patient and surgeon VAS scores were compared using the Wilcoxon-signed rank test. A value of  $p < 0.05$  was considered statistically significant. **TABLE 2** provides the raw data for the patient and surgeon assessments of pain using the VAS.

The mean pre-examination patient VAS score for the study (N=127) group was  $2.4 \pm 3.1$  (range 0-10) compared to  $1.5 \pm 1.8$  (range 0-6) for the surgeon. The difference was statistically significant ( $p < 0.001$ , Wilcoxon signed-rank test). Sixty-five patients reported a pain level of zero on the VAS. Among the 62 patients with some initial pain (VAS  $\geq 1$ ), 43 (69.3 percent) perceived their pain one or more VAS units higher compared to the surgeon. The median difference in pain perception was 2 VAS units higher for the patient compared to the surgeon ( $p < 0.001$ ).

The pain assessments of the patient and surgeon were not different between males and females ( $p = 0.40$ , Wilcoxon rank-sum test) or whites and blacks ( $p = 0.16$ ). The discrepancies between patient and surgeon scores were not

TABLE 1

### Patient Demographics

N = 127	
Males	42
Females	85
Average age	37.1
Age distribution	18-65
Race	
White	78
Black	27
Other	22
Patient accompanied	44
Patient alone	83

significantly different whether the assessments were performed by residents or attendings ( $p = 0.63$ ). The patient's age was not associated with pain assessment differences ( $p = 0.28$ , Spearman rank correlation coefficient). No differences in pain were found based on the presence or absence of a patient companion in the examination room ( $p = 0.44$  Spearman rank correlation coefficient).

## Discussion

Previous studies in the literature report that physicians frequently underestimate pain.<sup>10-13,18</sup> The results of this study suggest that surgeons underestimate the patients' level of pain and may therefore contribute to inadequate treatment. It is important to notice that the patients evaluated in this study represent a wide range of conditions in oral and maxillofacial surgery. It can be argued that the profile of patients presenting with different categories of problems such as those with temporomandibular joint disorders are significantly different to patients presenting for dentoalveolar surgery or obstructive sleep apnea. Future studies could compare the differences in patients' and surgeons' assessments of pain in different categories of patients. The authors hypothesize that clinicians underestimate the patients' perception

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TABLE 2

## Patient and Surgeon Assessments of Pain in Oral and Maxillofacial Surgery

Patient No.	Age	Sex	Patient type	Escort	Patient VAS	Doctor VAS
1	27	F	Orthognathic	No	0	0
2	64	F	Pathology	Yes	4	1
3	25	M	Other	No	0	1
4	22	M	Orthognathic	Yes	2	0
5	36	F	Dentoalveolar	No	0	0
6	29	F	Dentoalveolar	No	5	2
7	56	F	Orthognathic	Yes	3	2
8	18	F	Dentoalveolar	Yes	3	4
9	18	F	Orthognathic	Yes	0	0
10	47	F	TMJ	No	10	6
11	51	F	Dentoalveolar	Yes	7	2
12	64	M	Dentoalveolar	No	0	0
13	24	M	TMJ	Yes	2	2
14	46	F	Orthognathic	No	8	4
15	39	M	Orthognathic	Yes	3	3
16	40	F	TMJ	Yes	8	0
17	45	F	TMJ	No	6	5
18	34	M	Trauma	No	5	2
19	45	F	Orthognathic	No	2	2
20	18	F	Orthognathic	No	5	0
21	20	F	Other	No	8	3
22	20	M	Trauma	Yes	5	3
23	22	F	Other	No	0	0
24	55	F	Dentoalveolar	No	0	0
25	21	M	Trauma	No	0	1
26	77	F	Other	Yes	3	2
27	37	M	Orthognathic	No	0	0
28	65	F	Other	No	0	0
29	24	F	Dentoalveolar	No	1	0
30	18	M	Other	Yes	4	4
31	65	F	Dentoalveolar	No	10	3
32	48	F	Pathology	No	0	0
33	18	M	Other	Yes	0	0
34	25	F	Dentoalveolar	No	3	1
35	32	F	Dentoalveolar	No	0	0
36	43	M	Orthognathic	No	0	0
37	28	F	Pathology	Yes	2	1
38	22	M	Dentoalveolar	No	0	0
39	43	F	TMJ	No	5	6
40	32	M	Other	Yes	0	0
41	54	F	Orthognathic	No	2	0
42	30	M	Pathology	No	0	0

CONTINUES

TABLE 2 CONTINUED

## Patient and Surgeon Assessments of Pain in Oral and Maxillofacial Surgery

Patient No.	Age	Sex	Patient type	Escort	Patient VAS	Doctor VAS
43	59	F	Dentoalveolar	No	10	1
44	43	F	Pathology	No	1	1
45	29	M	Dentoalveolar	No	4	1
46	57	M	TMJ	Yes	5	2
47	22	M	Implant	Yes	0	3
48	42	M	Trauma	No	2	3
49	48	F	TMJ	No	6	3
50	29	F	Orthognathic	No	0	1
51	26	F	Implant	No	0	0
52	56	F	Other	No	2	2
53	64	M	Implant	No	0	0
54	56	F	Dentoalveolar	No	0	0
55	52	M	Other	No	0	0
56	38	F	Dentoalveolar	No	0	0
57	19	F	Orthognathic	No	0	0
58	18	F	Orthognathic	Yes	0	0
59	59	F	Other	Yes	10	5
60	45	F	Other	No	0	0
61	52	F	Pathology	No	4	6
62	40	F	TMJ	Yes	10	5
63	25	F	TMJ	Yes	5	2
64	25	M	Dentoalveolar	No	10	5
65	18	F	Dentoalveolar	No	4	3
66	43	M	Pathology	No	0	0
67	31	M	Trauma	No	5	5
68	28	F	Orthognathic	Yes	0	0
69	38	M	Dentoalveolar	No	4	2
70	18	M	Pathology	Yes	0	0
71	19	F	Orthognathic	Yes	0	0
72	65	F	Dentoalveolar	No	2	1
73	31	M	Orthognathic	No	0	0
74	54	F	Orthognathic	No	4	4
75	18	F	Dentoalveolar	Yes	0	0
76	58	F	Other	No	0	1
77	54	F	Orthognathic	No	5	2
78	23	M	Dentoalveolar	No	0	0
79	18	M	Implant	No	0	0
80	29	F	Dentoalveolar	No	0	0
81	38	F	Dentoalveolar	No	0	2
82	18	F	Orthognathic	Yes	0	0
83	82	F	Pathology	Yes	4	6
84	24	F	Dentoalveolar	No	0	0

CONTINUES

TABLE 2 CONTINUED

## Patient and Surgeon Assessments of Pain in Oral and Maxillofacial Surgery

Patient No.	Age	Sex	Patient type	Escort	Patient VAS	Doctor VAS
85	60	M	Pathology	No	0	0
86	22	F	Other	No	7	4
87	25	F	Dentoalveolar	No	6	6
88	28	M	Dentoalveolar	No	0	0
89	18	F	Orthognathic	Yes	0	1
90	52	F	Dentoalveolar	No	0	0
91	38	M	Dentoalveolar	No	0	1
92	32	M	TMJ	Yes	6	3
93	28	F	Dentoalveolar	Yes	4	1
94	38	F	TMJ	No	0	1
95	30	M	Other	No	8	4
96	28	M	Dentoalveolar	No	0	0
97	31	F	Dentoalveolar	No	0	0
98	53	F	Pathology	No	8	6
99	39	M	Orthognathic	Yes	3	2
100	43	F	Implant	No	0	0
101	64	M	Implant	Yes	0	0
102	26	F	Orthognathic	No	2	0
103	63	F	Dentoalveolar	No	0	0
104	33	F	TMJ	No	6	6
105	22	F	Dentoalveolar	Yes	0	0
106	19	M	Orthognathic	Yes	0	0
107	28	M	Dentoalveolar	No	0	0
108	25	F	TMJ	No	0	0
109	47	F	TMJ	No	5	3
110	65	F	Dentoalveolar	Yes	0	0
111	29	F	TMJ	No	3	3
112	49	F	Pathology	Yes	0	0
113	52	F	Orthognathic	No	7	3
114	38	F	Orthognathic	No	1	2
115	27	F	Orthognathic	Yes	0	0
116	48	M	Orthognathic	No	0	0
117	49	F	Other	Yes	0	0
118	25	F	Dentoalveolar	No	10	3
119	22	F	TMJ	Yes	5	2
120	27	F	Pathology	Yes	4	4
121	29	F	Dentoalveolar	Yes	0	0
122	52	F	Pathology	No	1	2
123	25	F	Dentoalveolar	No	0	0
124	38	F	Pathology	No	0	0
125	42	M	Pathology	No	0	0
126	30	M	Pathology	Yes	10	3
127	18	F	Pathology	Yes	0	2

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of pain irrespective of the presenting condition. However, a larger sample size is required to confirm this hypothesis.

The results of this study need to be interpreted with caution. The treatment of pain is complex and has puzzled physicians through history. It is not the intention of this study to suggest more aggressive pharmacological treatment of pain. Each case needs to be evaluated independently. However, recognition of the patient's pain level is a critical step in adequate treatment. Psychodynamic psychotherapy is one of the prevailing theories in psychiatry popularized by Sigmund Freud in the early 1900s.<sup>49</sup> It proposed that patients frequently experience improvement in their mental condition through recognition and discussion (free association) of their problems without any active intervention (psychiatric or medical). One can hypothesize a similar relationship with pain. Perception and adequate acknowledgment of pain by clinicians can potentially be therapeutic for the patient. Additionally, the clinician would make treatment recommendations that are more adequate given the patient's condition.

The reported range of pain assessment by the patients on the VAS was from 0 (no pain) to 10 (worst possible pain). However, the highest VAS score by the evaluating surgeon was only 6. The visual analog scale clearly describes a level of pain designated at 10 as the "worst possible pain." One would assume that a patient experiencing a pain of this intensity would show behavioral cues (crying, wincing, moaning, doubling over, clenching the teeth, or covering up the area of pain) that conform to this description of pain. Eight patients (6.3 percent) reported a VAS score of 10. The average VAS score for the same group of patients by the surgeons was 3.9 (range 1-6). It is clear that the assessment differences are

increased on the higher end of the VAS.

Munchausen syndrome (factitious disorder) is well described in the literature.<sup>20</sup> In this disorder, patients overstate their pain for a secondary gain (nonfinancial). The incidence of this disorder is 0.5-1 percent.<sup>21</sup> Therefore, its prevalence does not explain the authors' observation. Malingering is a different condition where patients fake or exaggerate their pain for a primary gain (such as financial gain, work excuse, workers' compensation, insurance, litigation). In a study by Mittenberg using a survey of 33,531 cases of personal injury, 29 percent involved probable malingering and symptom exaggeration.<sup>22</sup> Only a small percentage (3.9 percent) of the patients presented secondary to personal injury. This also would not account for the discrepancy in the authors' observation. However, a more elaborate study on the etiology of injury and the ability of clinicians to perceive the patient's level of pain would be necessary to shed answers to this question.

Enormous health care costs can arise from both of these conditions or the undertreatment of pain regardless of etiology. It is important to conduct careful history and physical examinations to identify patients that may exhibit either of these conditions and prevent unfavorable treatments and outcomes.

No difference in the assessment of pain between whites and blacks was identified in this study.

The review of the literature by Todd for pain assessment and ethnicity found very inconsistent results in the literature.<sup>8</sup> It would appear a very large sample size would be required to identify any possible ethnic differences in the assessment of pain between clinicians and patients. Sixty-seven percent (85) of the patients in this group were females. That is consistent with previous reports in the literature documenting that females are commonly

present to their doctors for the evaluation of pain.<sup>23-25</sup> In the authors' study, surgeons underestimated the patients' perception of pain irrespective of their gender.

The complex anatomy of the head and neck region and the close proximity of multiple specialized tissues and neurovascular structures can make the diagnosis and treatment of pain challenging. Oral and maxillofacial surgeons need to have a low threshold for the referral of patients with chronic pain for evaluation by pain specialists, especially if no surgical etiology is identifiable.

## Conclusions

Clinicians using standard history and physical examination techniques in patients reporting a pain intensity  $\geq 1$  on the visual analog scale in oral and maxillofacial surgery underestimated a patient's subjective report of pain in more than two-thirds of patients. We also need to be cognizant of other disorders or possible motivations for patients to overstate their pain. ■■■■

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