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AUG 82 P S GROVER, L LORTON, J HOLLINGER

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Pain or discomfort as a consequence of one-visit restorative dental treatment may occur because the dental structures along with perioral structures were abused, or even managed according to classically acceptable techniques. This study relates some typically one-visit dental procedures to post-treatment pain or discomfort instances.

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Incidence of pain or discomfort following one-visit operative treatment: a clinical study

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Pain or discomfort as a consequence of one-visit restorative dental treatment may occur because the dental structures along with perioral structures were abused, or even managed according to classically acceptable techniques. The purpose of this study is to relate some typically one-visit dental procedures to post-treatment pain or discomfort instances.

METHODS AND MATERIALS

Seventy patients were selected at random from a population of restorative patients at a military dental clinic which served both active duty personnel and dependents. Operative procedures included Classes I, II, and V amalgams in posterior teeth and Class III, IV, and V composite restorations in anterior teeth. The patients were randomly assigned to four different operators. Basic principles of cavity design and pulp pulp protection were discussed, but no attempt was made to reach concensus decisions on correct treatment procedures. The criteria for treatment were as follows:

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1. Only where all procedures were done on succedaneous teeth would the patient be included in the study.

2. Only one-quadrant procedures were completed during the test appointment.

3. All teeth were isolated by rubber dam whenever possible.

4. Slow-speed round burs or hand-spoon excavators were used for excavating decay. High-speed rotary cutting instruments with water spray were used for cavity preparation.

5. The assessment of the depth of the cavity preparation (in mm) was made using a peridontal explorer by measuring the deepest preparation from the dentoenamel junction.

The use of pulp protective agents, matrix and wedges and the type of anesthetic injection technique were left to the judgment of the operators.

The operators completed a standard form that described the treatment variables, such as type of injection, tooth number and surface treated, material used, type of pulp protection, etc. At the end of the procedure, the patient received a standard questionnaire and instructions to answer the questions within 12 hours after the anesthetic effects had disappeared, and return the questionnaire to the clinic. The results of the two sets of questionnaires were merged and analyzed.

RESULTS

Seventy sets of questionnaires were gathered. Some patients did not answer all the questions and thus the total respondents for any particular question may not total to 70.

The questions (in abbreviated form) answered by the patients and their frequency of each answer is as follows:

1.	Length of duration of anesthesia:	less than 1 hour	3%
		more than 1 hour	97%
2.	Any postoperative pain?	none	9.6%
		mild	78.9%
		severe	11.5%
3.	Pain was confined to:	head	81%
		neck	12.7%
		both of above	4.2%
		back	2.1%
		all of above	0
4.	Pain lasted:	less than 1 hour	15.5%
		more than 1 hour	84.5%
5.	Muscles of jaw were sore:	yes	55.9%
6.	Difficulty was experienced in opening mouth?	yes	50%
7.	There was pain at site of injection?	yes	58.8%
8.	There was soreness in the gums around site?	yes	54.4%
9.	Tooth is now sensitive to sweets?	yes	23.5%
10.	Tooth is now sensitive to hot or cold?	yes	50%
11.	The tooth or filling feels "high"?	yes	22%

12.	An oral analgesic was taken?	yes	41%
13.	There was time lost from work due to the after affects of this procedure?	no	92.6%

Table I summarizes the type of treatment provided during restorative procedures.

When cross tabulations were made of the treatment modalities, several interesting relationships were noted. There seemed to be no relationship between depth of preparation and whether the tooth was ultimately sensitive to thermal shock. However, the incidence of pain and the need to take an analgesic increased with the depth of the preparation (Table II). The use of different pulp protective agents showed some tendency towards effectiveness (Table III).

There was no increase in soreness of the gingiva when a wedge was used. However, 55% of those patients (32/58) who had a wedge/matrix used during the restorative procedure experienced gingival soreness. Soreness was also present in 62% (5/8) of those patients who did not have wedge used, but who did have a rubber dam used to isolate the teeth.

Difficulty in mastication was experienced by approximately the same number of patients regardless of the type of injection administered: infiltration 46% (6/13), block 53% (8/15), both 62% (13/21).

Those with a history of pain in the treated area had postoperative pain at a higher rate 93% (14/15) than those with no preoperative pain 75% (31/41). This difference is significant at only $\beta.27$ level of probability, using a x^2 test.

The incidence of postoperative pain was no different among the patients treated by different operators.

DISCUSSION

It is difficult to assess the degree of effect that the questioning process had upon the subjects in their subjective evaluation of their postoperative pain. It is significant to our concerns about the need for patient acceptance of dental care that patients be instructed about the high probability (90%) of some type of postoperative distress. If the patient is warned that some discomfort may be expected, even though all possible efforts have been made to forestall it, the patient will be mentally prepared and the clinician will have demonstrated his awareness of the results of his treatment.

Based upon the data collected in this clinical study, it was apparent that there was an increase in the incidence of post-treatment pain with an increase in preparation depth with dentin. Even with what may be considered as a shallow dental restoration, 50% of the patients surveyed reported mild post-treatment discomfort.

The different pulp protective agents did not appear to appreciably reduce or mitigate against thermal sensitivity 12 hours post-treatment. The increased incidence of thermal sensitivity when cavity preparations were treated with calcium hydroxide and copal varnish contrasted with a lower post-treatment sensitivity when only calcium hydroxide was used. This phenomenon has also been reported in another clinical study.[1]

The incidence of pain in neck and back, which may be construed to be related to the amount of time spent in the dental chair, is low (19%). This may indicate that a short procedure (maximum 1 hour) was not a

significant contributing factor to patient discomfort. The discomfort upon mastication, irrespective of the type of injection administered, implies that some discomfort was due to the strain of "staying open" rather than local trauma at the injecting site.

Pain at the site of injection was experience by 59% of the patients. This is most probably caused by traumatic injury by the needle to the muscle and surrounding soft tissue. Although it has been traditionally accepted that difficulty in opening after operative procedures on the mandible is caused by the trauma of the injection, the percentage experiencing opening difficulty with infiltration (46%) was essentially equivalent to that percentage of the patients who had blocks (53%).

The gingival soreness that was experienced by 55% (32/58) of the patients who had a matrix and wedge used, agrees with previous observations.[2] There was some gingival irritation around teeth which had no matrix or wedge 62% (5/8). This may be attributed to the rubber dam, the carving of the restoration, or the mechanical irritation of particulate matter left in the sulcus after restoration placement.

CONCLUSIONS

Within the first 12 hours following a one-visit dental restorative treatment, some type of discomfort was experienced by 90% of 70 dental patients questioned. Masticatory muscle soreness, soreness at injection site, and thermal sensitivity were all experienced by more than 50% of the patients. Discomfort became so severe that an oral analgesic was taken for relief by 41% of the patients. It is therefore advisable for the dentist to be aware of the high incidence of post-treatment pain and discomfort that will probably occur following dental treatment, and

prepare the patient for the possibility of such sequillae.

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Table I. Treatment modalities

	Percentage	No. of patients
A. Mode of anesthesia		
Infiltration anesthesia	46	28/61
Infiltration and block	36	22/61
Block alone	26	16/61
B. Method of isolation		
Cotton roll	40	25/62
Rubber dam	60	37/62
C. Material used		
Amalgam alloy	82	51/62
Composite resin	13	8/62
Temporary restorative material	8	3/62
D. Previous history of pain		
Yes - pain in the treated tooth/teeth	26	16/62
No - pain in the treated tooth/teeth	74	46/62
E. Pulp protection used		
Cal. Hydroxide	54	36/66
Cal. Hydroxide & Copal Varnish	29	19/66
Copal Varnish	11	7/66
Cal. Hydroxide, Copal Varnish and Zinc Phosphate Cement	6	4/66
F. Matrix/wedge used	88	58/66
No matrix/wedge used	12	8/66
G. Number of anesthetic cartridges used	1.6 average	0.5-3.0 range

Table II. Estimated depth of preparation from dentoenamel junction

	1 mm	2 mm	3 mm	>3 mm
% with pain	50 (5/10)	68.8 (22/32)	85.7 (12/14)	100 (2/2)
% needing analgesic	9.1 (1/11)	34.2 (13/38)	85.7 (12/14)	100 (2/2)
% sens. to cold/hot	46 (5/11)	49 (18/37)	60 (9/15)	50 (1/2)

Table III. Pulp protective agent & post-treatment sensitivity

	Cal. Hydroxide	Cal. Hydroxide + Copal Varnish	Cal. Hydroxide, Copal Varnish & Zinc Phosphate Cement
% sens. to temperature	40% (14/35)	68% (13/19)	55% (6/11)
% sens. to sweet	14% (5/35)	35.0 (7/20)	33% (3/9)