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Emergency Pulpotomy: Pain Relieving Effect with and without the Use of Sedative Dressings

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Seventy-three teeth with acute irreversible pulpitis were subjected to emergency pulpotomies. After removal of the coronal portion of the pulp, a sterile cotton pellet or zinc oxide-eugenol cement was placed against the remaining pulp tissue. The cotton pellet was either dry or moistened with camphorated phenol, cresatin, eugenol, or isotonic saline. This gave six different groups of treatment following the pulpotomy. All teeth were sealed with zinc oxide-eugenol cement. By means of questionnaires, symptoms were recorded after the anesthetic effect was gone and also at 1, 7, and 30 days after treatment. A total of 70 patients (96%) reported pain relief. Three patients did not experience relief and returned for pulpectomy. After the first postoperative day, no pain was reported by any of the patients. The frequency of discomfort decreased from 11% 1 day postoperatively to 1% 30 days after the emergency treatment. There was no difference in recorded symptoms among the six treatment groups. Thus, removal of caries, pulpotomy, and sealing of the cavity apparently was a reliable means to relieve pain. The use of the various dressings did not contribute to the relief of pain.

Acute pain from pulpal inflammation often reaches such a magnitude that emergency treatment becomes necessary. There is a general agreement that, if endodontic therapy is needed, the treatment of choice is a complete removal of the pulp (1–6). However, because pulpectomy is a time-consuming procedure less time-consuming pain-relieving procedures are needed because emergency patients most frequently are unscheduled. Pulpotomy, including sealing of sedative and antibacterial dressings in the pulp chamber, has been advocated in emergency situations (2, 3, 6, 7). Among the dressings that have been recommended for this purpose are camphorated phenol (1, 7), cresatin (3), and eugenol (6).

Inasmuch as the outcomes of endodontic emergency procedures rarely have been evaluated, the aim of this study was to investigate the pain-relieving effect of pulpotomy with special reference to the influence of sedative dressings.

MATERIALS AND METHODS

Seventy-three patients seeking emergency treatment because of pain from pulpal inflammation were studied. All teeth were vital and had either spontaneous pain or lingering pain after contact with hot or cold foods and drinks. The teeth were anesthetized (Xylocaine with epinephrine, 20 mg/ml, 12.5 μg/ml; Astra, Södertälje, Sweden). All caries and leaking fillings were removed. After the access preparation, the coronal portion of the pulp was removed by means of round burs in a slow-speed handpiece to the level of the canal orifice. When the bleeding had stopped, a cotton pellet moistened with eugenol, cresatin, isotonic saline, or camphorated phenol was placed on the remaining pulp tissue. Alternately, cotton pellets used dry, without any medication were also placed on the pulp tissue. The access cavities were then sealed with zinc oxide-eugenol cement. In some instances the zinc oxide-eugenol cement was placed directly on the remaining pulp tissue without the use of a cotton pellet. Thus, there were six different ways of treatment (eugenol, cresatin, isotonic saline, camphorated phenol, dry pellet, and zinc oxide-eugenol cement). The type of treatment was chosen randomly. The distribution of teeth and treatment methods used are shown in Table 1.

TABLE 1. Composition of experimental material

Teeth	Camphorated Phenol	Eugenol	Cresatin	Zinc Oxide-Eugenol	Saline	Dry Pellet
Incisors	2	1	1	0	1	2
Premolars	4	2	2	3	2	2
Molars	6	8	8	10	9	10
Total	12	11	11	13	12	14

After completion of treatment each patient received three questionnaires in which postoperative symptoms were to be recorded. The first questionnaire was filled in when the anesthetic effect had disappeared. The second questionnaire was completed 1 day and the third 7 days after the emergency treatment. The patients were asked to check on the questionnaire whether the tooth was tender, aching, or free from symptoms. The patients were given a recall appointment 30 days after the emergency treatment. At this appointment symptoms were recorded again and a pulpectomy was performed.

TABLE 2. Symptoms after pulpotomy

Days after Treatment	No. of Patients	Pain	Discomfort	No Symptoms
0	73	16	33	24
1	70	0	8	62
7	70	0	5	65
30	68	0	1	67

RESULTS

When the anesthetic effect was gone 16 patients (22%) still reported pain (Table 2). Three of these patients (4%) immediately returned for treatment. Pulpectomies were carried out and these patients were excluded from the continued study. Thirty-three patients (45%) reported tenderness, whereas 24 (33%) reported no symptoms at all. One day after emergency treatment none of the patients had any pain. Eight patients reported tenderness. Of the 68 patients who returned on day 30, only one reported tenderness (Table 2). Data from the six groups of patients subjected to the different ways of treatment

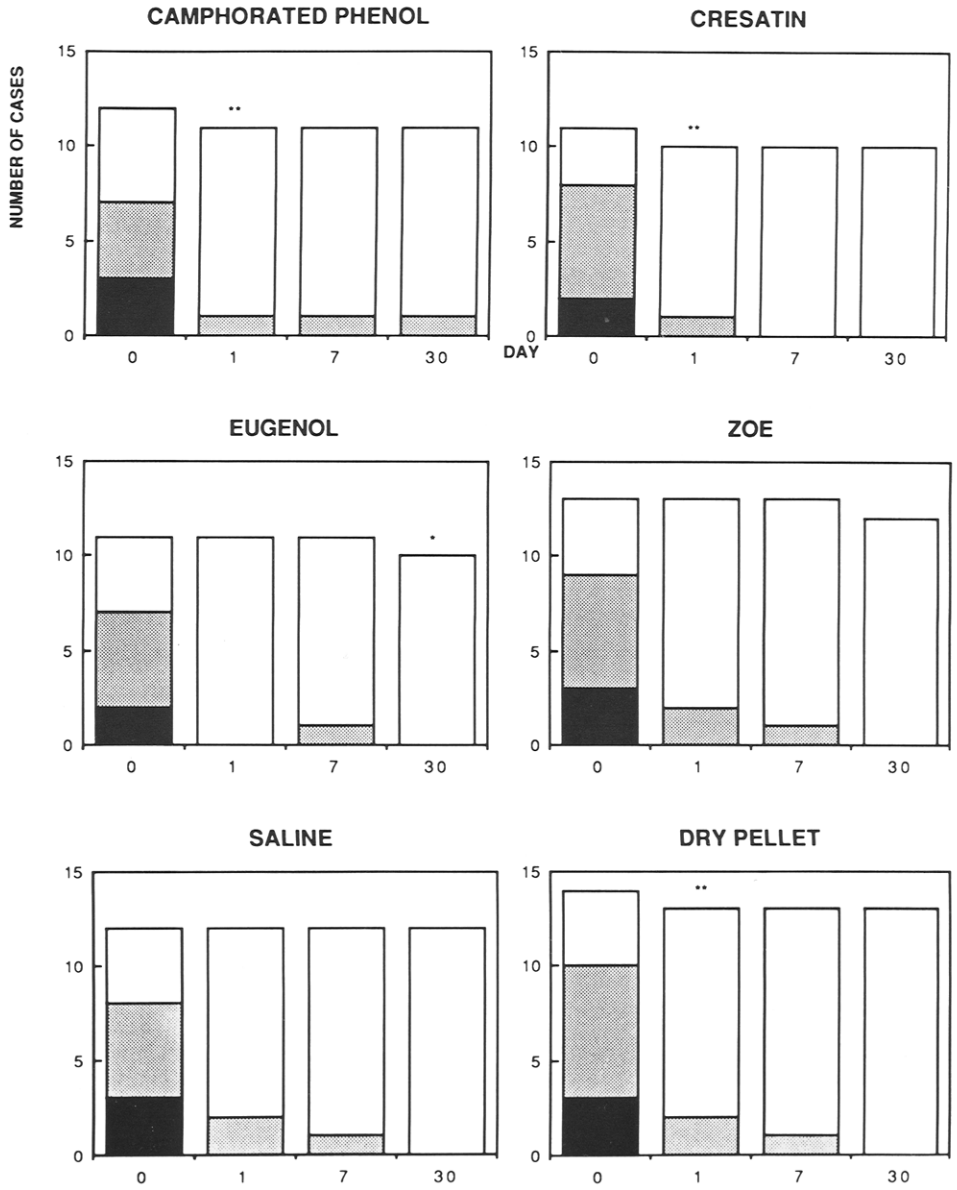

FIG 1. Recorded symptoms related to the various dressings used. ■, pain; ▨, discomfort; □, no symptoms. *Two stars*, patient needed further emergency treatment; *one star*, patient did not show up at 30-day clinical examination.

are shown in Fig. 1. There were no differences among the six groups.

DISCUSSION

The use of sedative dressings has been advocated when inflamed pulp tissue is left in a tooth (2, 3, 6, 7). Included in the present investigation were traditional medicaments for this purpose such as camphorated phenol (1, 7), cresatin (3), and eugenol (6). Zinc oxide-eugenol cement has been found to promote healing in exposed, inflamed pulp tissue (8). The sterile, isotonic saline was added to this study as a nonmedicament comparison. Also, at some dental schools (e.g. University of Connecticut and Columbia University) a dry, sterile, cotton pellet is used after pulpotomy to avoid adverse effects from a dressing on the remaining pulp tissue. Because of positive reports about this kind of treatment it was included in this study.

The emergency pulpotomies had a favorable effect on the registered pain level. Seventy of the patients (96%) reported sufficient pain relief immediately after treatment. This result confirms the findings of Bjerkén et al. (7), who, using camphorated phenol as dressing, found relief of symptoms in 93% of cases subjected to emergency pulpotomy. One day after emergency treatment none of the remaining 70 patients in our study reported pain.

The various dressings had no influence on the accomplished pain relief. This is in keeping with the results of a study of treatment of exacerbating periapical inflammation (9). In that study it was found that the cleaning of the root canal and the placement of a temporary filling to avoid reinfection was the major cause of pain relief whereas no contribution was obtained by the use of different intracanal dressings.

Discussing treatment of irreversible pulpitis, Natkin (1) assumed that "the probability of eliminating pain is directly related to the extent of tissue removal." This view is partly supported by Bjerkén et al. (7), who have reported pain relief in 99% of the patients subjected to pulpectomy treatment; 93% experienced pain relief after pulpotomy and 82% after a mere trephination into the pulp chamber. However, when pulpectomy was initiated but not completed, only 84% of the patients experienced pain relief (7). Thus, it appears that if there is not sufficient time for a complete removal of the pulp tissue, pulpotomy will give superior pain-relieving effect when compared with incomplete canal instrumentation.

Sometimes there may be a long time period between the emergency pulpotomy and the pulpectomy treatment. In such instances there is a risk that the remaining part of the pulp will become infected through a defective temporary filling. The placement of zinc oxide-eugenol cement directly on the pulp tissue, thus filling the whole access cavity, will decrease the risk for leakage.

In conclusion, the important parts of emergency treatment of pulpitis are the removal of irritants, e.g. caries, the removal of the most inflamed part of the pulp tissue, and the placement of a temporary filling to avoid reinfection. The use of different sedative dressings seem to have no pain-relieving effect.

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