
CLINICAL ARTICLES

Effective One-visit Therapy for the Acute Periapical Abscess

Tratamiento Efectivo en una Sola Sesión en Abscesos Periapicales Agudos

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Nineteen patients with acute periapical abscess, i.e. frank soft tissue swelling associated with an endodontically involved tooth, were treated using a single-visit endodontic protocol. Only teeth with one or two canals were included in case selection. The treatment consisted of (a) soft tissue incision and drainage of the fluctuant swelling; (b) standardized endodontic preparation and obturation procedures; and (c) proper antibiotic regimen. None of the patients treated according to this protocol experienced exacerbations of presenting signs and symptoms after treatment. Complete resolution of swelling was achieved within 3 to 7 days. All of the patients who were contacted at 24-h postoperatively gave the subjective impression that their initial pain had been significantly decreased or completely resolved. At the 1-yr recall appointment, 11 of the original 19 patients returned. All were asymptomatic and showed radiographic evidence of reduction in lesion size.

Diezinueve pacientes con absceso periapical agudo, por ej. franco edema de los tejidos blandos asociado a un diente con patología endodóntica fueron tratados en una sola sesión endodóntica. El tratamiento consistió en (1) incisión del tejido blando y drenaje del edema fluctuante, (2) preparación endodóntica estandarizada y obturación del o los conductos, y (3) indicación correcta de antibiótico. Ninguno de los pacientes tratados de esta forma experimentó exacerbaciones de los signos y síntomas presentes después del tratamiento. La resolución completa del edema se obtuvo entre los 3 y 7 días. Todos los pacientes con los que se puso en contacto a las 24 hs del postoperatorio, dieron la impresión subjetiva de que el dolor inicial había

disminuído significativamente o había desaparecido. Once de los 19 pacientes regresaron para un control postoperatorio al cabo de un año. Todos estaban asintomáticos y habia evidencias radiográficas de reducción en el tamaño de la lesión.

The methodologies for treating teeth with acute periapical abscesses, i.e. frank soft tissue swelling associated with an endodontically involved tooth, are perhaps as varied as the number of dentists rendering therapy (1). When such a clinical problem arises, the immediate objective is alleviation of pain and swelling for the patient. Various mechanical and medical regimens have been used depending on the circumstances and operator preferences. Each time, however, the clinician must make treatment decisions regarding methods of drainage and the amount of medication. Unfortunately, there is little data in the literature to guide us in making these decisions.

As a result of the tremendous success of conventional multiple-visit endodontic therapy, single-visit endodontic therapy has until recently been a neglected mode of therapy (2-5). In the case of an abscessed tooth, it is generally considered a contraindicated mode of therapy (6, 7). The purpose of this investigation was to evaluate a concise protocol for treating the abscessed tooth endodontically in a single visit.

MATERIALS AND METHODS

Case selection was limited to patients of the University of Chicago emergency dental service who presented with endodontically involved teeth with associated soft tissue fluctuant swelling. Fluctuant swelling is defined here as swollen soft tissue which when pal-

pated gives the sensation of a fluid-filled space. Only teeth with one or two canals were included in case selection. The sample size included 19 such patients. All patients received the single-visit protocol as soon after their first contact with the dental clinic as possible. Eight patients presented with their symptoms after clinic hours and were given pain medication and antibiotics (Penicillin V, 500 mg every 6 h, or erythromycin, 500 mg every 6 h), and appointed to the hospital dental clinic for therapy at 12 P.M. the following day.

The patient's oral temperature was taken prior to the examination. The single-visit endodontic treatment protocol consisted of first identifying the infected tooth via radiographs and clinical testing. Block anesthesia was then obtained to avoid injection through or into the associated swelling. A 1- to 1½-cm incision was made with a scalpel in the dependent fluctuant swelling and a curette or hemostat was inserted through this incision to establish communication with all parts of the swelling. After all drainage had been removed via manual manipulation of soft tissue, a sterile penrose drain was placed and a moist 4 × 4 sterile gauze was folded to fit in the vestibule over the incision site. The gauze absorbed further oozing from the wound during the remainder of the procedure, preventing any drainage from accumulating in the oral cavity.

A rubber dam was placed to achieve single tooth isolation of the involved tooth and endodontic access was created in the usual fashion. Prior to instrumentation, the canal was irrigated with 5 ml of 5.25% sodium hypochlorite. Gates Glidden rotary instruments sizes 2 through 6 created the coronal flare and K-type instruments prepared the apical portion of the canal, using standardized preparation sizes according to Roane (2). The canal was irrigated frequently with 5.25% NaOCl throughout the preparation procedures. Upon completion of instrumentation, the canal was dried with sterile paper points and visual inspection made to check for canal cleanliness as far apically as could be seen.

An oversized standardized gutta-percha cone was fitted using chloroform to within 1 mm of the apex, coated with sealer (Kerr Pulp Canal Sealer), replaced into the canal, and vertically condensed using heat (2). The access was closed with temporary filling material and the occlusion reduced where esthetically permissible. Rubber dam apparatus and sterile gauze were removed and a final check was made to ensure the rubber drain was in place. If not previously prescribed, 7 days of antibiotics (Penicillin V, 500 mg every 6 h, or erythromycin, 500 mg every 6 h) were ordered. The patient was instructed to return in 72 h for evaluation of swelling and for drain removal, unless their symptoms exacerbated, in which case they were instructed to return to our emergency service immediately. All patients were called at 24-h postoperatively to ascertain their condition with respect to pain experienced.

Patients were recalled at 3, 6, and 12 months to

assess the healing process via radiography and physical examination. The procedure was defined as successful if (a) the patient's signs and symptoms did not exacerbate after the one-visit protocol and (b) at the 1-yr recall, the tooth was asymptomatic and had radiographic evidence of a decrease in lesion size.

RESULTS

Nineteen patients were treated in a single visit according to the protocol described. No patient experienced exacerbation of swelling or pain requiring return to the emergency service. Twelve of the 19 patients were reached by telephone at 24 h postoperatively and all reported either a significant decrease or complete absence of pain. Sixteen patients returned at 72 h for drain removal, and all but three had total resolution of swelling. These three patients had reduction in the size of the initial swellings but these areas remained slightly swollen at day 3, and the drain was removed in each of these patients by day 7. The three patients that did not return at 72 h returned at days 4, 5, and 30, respectively, and had total resolution of their swellings at those times. Two of the 19 patients had elevated oral temperatures (39.0°C and 39.6°C) at the time of treatment.

After 1 yr, recall examination was completed on 11 of the 19 patients originally treated. All 11 were considered to be treated successfully according to the recall criteria. An example of reduction of lesion size is shown in Fig. 1.

DISCUSSION

In light of the single-visit endodontic data compiled by Dr. James B. Roane at the University of Oklahoma (2), this study was initiated to test the rationale of that technique in combination with soft tissue drainage to treat teeth with acute periapical abscesses.

Specifically, it is our opinion that the most effective and most predictable method of resolving an acute



Fig 1. Preoperative radiograph (*left*) of tooth #10 in a 10-yr-old male that presented clinically with labial vestibular swelling; 1 yr postoperative (*right*) depicting reduction of lesion size.

abscess is by incision and drainage of the soft tissue. The rationale, based on clinical experience, is that drainage through the tooth is not predictable enough because of the size of the apical foramen and the possibility of the foramen becoming obstructed. Furthermore, an abscess occasionally expands and dissects soft tissue further, even in the presence of a patent apex. This concept is generally accepted by many oral surgeons (8, 9) but is in disagreement with current endodontic teaching (6).

Second, it is our opinion that once drainage is obtained via soft tissue incision and drainage, there is no contraindication to instrumentation and obturation of the root canal system. An effective incision and drainage relieves periapical pressure and allows instrumentation of a dry root canal. Successful local anesthesia is crucial to enable the operator to perform this procedure. Block anesthesia (10, 11) utilized in this study gave profound anesthesia and allowed the patients to tolerate the procedure well.

A very interesting finding of this study was that only 2 of the 19 patients had elevated oral temperatures at the time of treatment. No special considerations were made for these two patients. Eisenbud and Klatell (12) reported 300 cases of acute alveolar abscess that required hospitalization. The incidence of admission temperatures in their sample of permanent teeth was 13% (37 to 37.8°C), 55% (37.9 to 38.9°C), 27% (39 to 40°C), and 5% (40.1°C up). The lower incidence of elevated initial oral temperatures found in this study may be accounted for by a difference in severity of the cases as our patients were not so debilitated by their swellings to require hospitalization.

A common source of controversy with the one-visit endodontic technique is the amount of associated pain the patient will experience. When comparing postoperative discomfort following only the obturation appointment, indeed there may be a slight increase associated with the single-visit technique. However, one must consider that there is frequently pain associated with intermediate steps in the multiple-visit technique. Pekruhn (3) compared the total number of "pain days" experienced by patients treated with multiple- or single-visit protocols and found no difference between the two approaches. Roane et al. (4) also studied this phenomenon and found that single-entry endodontic treatments resulted in a postoperative pain experience approximately one-half as often as when multiple-entry treatments were used. Soltanoff (7) hypothesized that severe preoperative inflammation increases the likelihood of postoperative pain with the single-visit versus the multiple-visit technique. The results of our study, however, do not support this assumption. The subjects in this study felt the procedures were successful in controlling or alleviating their pain.

One clear advantage of this technique is the number of appointments necessary for the clinician to complete

the procedure. Sixteen of our 19 patients required only two visits; the single-visit protocol appointment and the drain removal visit. The other three patients still had some swelling, although diminished from initial presentation, at day 3 and returned one additional visit for drain removal. The traditional method of treating this problem involves draining the abscess through the root canal space and leaving the tooth open for a period of time. With the use of that method, Weine (13) reports that the average number of appointments necessary to complete treatment was 5.11. Bence et al. (14) reported similar findings showing that 45.8% of opened teeth would not tolerate closure the first time. Compared with treatment in a single appointment, such repeated visits are an inconvenience to both the patient and the dentist. Further support to this logic is given in a study by August (15), where 311 abscessed teeth previously left open were instrumented and closed at the same appointment. His study showed that on the same appointment, instrumenting and closing a tooth that had been previously left open was successful 94.9% of the time.

Perhaps another controversial aspect to the treatment of the acute periapical abscess is whether or not to use antibiotics and which antibiotics to use. This study's protocol dictated the empirical choice of either Penicillin V or, if the patient was allergic, erythromycin in 500-mg doses every 6 h. Pallasch (16) has stated that antibiotics are never a substitute for adequate surgical drainage. Since incision and drainage was performed for each patient in this sample, the antibiotic regimen may have been unnecessary.

Finally, it is necessary to put the findings of this study in perspective relative to the overall care of the patient. Clearly no single technique is the answer for every clinical situation and for every patient. A good practitioner individualizes the therapy rendered by considering the medical and psychological state of the patient, the skill of the clinician, the time available, and the availability of supporting staff. The technique proposed was found to be a safe, effective, and well-tolerated method of treating a potentially serious medical problem. When indicated and correctly performed, it is tremendously beneficial to the patient.

CONCLUSIONS

1. Two of the 19 patients with acute periapical abscesses presented with an elevated oral temperature.
2. All of the patients who were contacted at 24 h postoperatively gave the subjective impression that their initial pain had been significantly decreased or completely resolved.
3. None of the patients treated according to this protocol experienced exacerbations of presenting signs and symptoms after treatment.
4. Eleven of the original 19 patients returned for a 1-yr recall examination. These patients were asymptomatic.

matic and showed radiographic evidence of reduction in lesion size.

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