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EVALUATION OF POSTOPERATIVE PAIN AFTER ENDODONTIC TREATMENT IN PATIENTS OF THE DENTAL CLINIC

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Abstract: Endodontic treatment involves the chemical and mechanical preparation of a tooth with pulp inflammation or necrosis. Postoperative pain and difficulty in periradicular lesion regression may develop during endodontic treatment. Therefore, this study aims to evaluate whether the type of irrigating solution used in the endodontic treatment of single-cone filled teeth influences postoperative symptoms and periradicular lesion regression. This is a clinical, exploratory, qualitative, quantitative, and descriptive study involving 70 patients with necrotic and asymptomatic teeth at the multidisciplinary clinics of ITPAC-Porto Nacional. After endodontic treatment, patients were monitored for 24 hours, 48 hours, 2, 3, and 6 months to assess postoperative pain and periradicular lesion regression. During the follow-up periods, all 70 patients did not experience postoperative pain. This study concludes that endodontic treatment performed at ITPAC-Porto Nacional yields favorable results and is pain-free.

Keywords: Postoperative pain. Preservation. Endodontic treatment.

INTRODUCTION

The success of endodontic treatment is related to the effectiveness of chemical and mechanical decontamination and shaping of contaminated canals. This is followed by a filling to provide a hermetic seal, preventing the spread of new infection and ultimately causing the patient unsatisfactory postoperative pain (TEXEIRA, 2017).

Treatment effectiveness is correlated with scientific, mechanical, and biological monitoring. Pain control is essential, as pain may be related to the mechanical action of the instruments, the chemistry of the irrigants, auxiliary chemicals, and microbial activity in the periradicular region (ATTAR *et al* ., 2008).

Endodontic treatment techniques improve with each passing year. The goal is to provide quality treatment to the patient, eliminating pain and swelling, which are the main causes during the anamnesis. Understanding the patient's medical history and daily medication use is crucial to avoid drug interactions and to reduce pain control. According to Cohen (2011, 10th ed.), "the medical history must be updated periodically (at least annually or as needed)."

The essential goal of endodontic treatment is to ensure that teeth maintain their function without affecting the patient's health. The emergence of new materials, methods, and technology has elevated endodontic treatment to a high level of success, but it is not uncommon to find patients with treatment failure, with evident signs and symptoms. According to Rocha *et al* . (2020), even with efforts to achieve clinical success, failures are still subject to the possibility of endodontic interventions to maintain dental function.

There is a similar condition, known as " *flare-up* ", which results in a post-operative complication, which can occur both in single-session treatments and those performed with the use of intracanal medication (more than one surgical session) and which require a necessary intervention consultation to control the pain caused, arising from complications during a root canal treatment, generally associated with acute infectious processes (HARGREAVES; COHEN, 2011).

According to Rocha *et al* . (2020), the reasons for some endodontic treatment failures include: "persistence of bacteria in the root canal, lack of technical expertise on the part of the professional, unsatisfactory filling, untreated canals, incorrectly filled canals, exposure to saliva and loss of temporary sealing, inadequate restorations, microleakage, iatrogenic perforations, and instrument fractures." These may also be due to inappropriate techniques or inefficient chemical and mechanical mechanisms. "Resulting in tooth darkening, leakage of filling material, patient frustration, and, in some cases, the need for endodontic reintervention to maintain tooth function" (ROCHA *et al.,* 2020).

Endodontic treatment is viewed negatively by a large portion of the population due to its association with pain before, during, and after treatment. Endodontics is the specialty directly involved in the control and treatment of pulp and periapical diseases, which are associated with pain. Endodontic treatment directly addresses pain, taking into account the inflammatory and/or infected state of the pulp tissue (SANTOS, 2018).

According to Lopes *et al* . (2010 and 2015), in some situations, despite completed endodontic treatment, the patient reports discomfort when chewing, percussion, and/or palpation, and the symptoms may last for days, weeks, or even months. This condition does not represent a dental emergency, as the pain can be chronic, tolerable, and usually provoked. The cause is often not apparent, leading the professional to attribute the pain to psychological factors.

Given the context, this study aims to evaluate postoperative pain after endodontic treatment in patients at the ITPAC – Porto Nacional dental clinic.

METHODOLOGY

This is an observational, exploratory, descriptive study with a qualitative and quantitative approach, where pain will be evaluated after endodontic treatment of 70 patients treated by dentistry students in the multidisciplinary clinics of ITPAC Porto Nacional .

Patients were approached in the triage sector of the multidisciplinary clinic at ITPAC Porto Nacional .

Subsequently, patients were taken to a secluded room at ITPAC Porto Nacional , where they were explained the endodontic treatment technique in clear, accessible language. At this point, they were invited to participate in the study . Adequate time was given for participants to participate and reflect, consulting, if necessary, with family members or other individuals who could assist them in making a free and informed decision. After the patients' consent was obtained, the informed consent forms were signed.

The patients were treated by dentistry students from the multidisciplinary clinic of the dentistry course, who had teeth requiring endodontic treatment. After completion of endodontics, the patients were followed up for a period of 24 hours, 48 hours, 2, 3, and 6 months to assess postoperative pain and regression of the periradicular lesion, through questionnaires and the VAS pain scale (Table 01).

Table 01 - EVA pain scale.

Data from 24 hours, 48 hours, 2, 3, and 6 months were collected by phone or WhatsApp using the Pain Scale form. All data will be stored confidentially and analyzed using descriptive statistics, using absolute and percentage frequencies for categorical variables and means for pain scores.

RESULTS

Analysis of data collected using the Visual Scale Analog (EVE), composed put one line numbered of 0 the 10, where 0 represents absence of pain and 10, pain unbearable collected put telephone contact or via WhatsApp, applied to 70 patients revealed that all participants (100%) did not have any postoperative pain after endodontic treatment within 24 hours, 48h, 2, 3 and 6 months . As per **Table 2** , it shows the distribution of periods and postoperative pain.

DISCUSSION

MOREIRA *et al.* (2017) aimed to evaluate the clinical and radiographic examination, the postoperative pain index, and current pain in endodontically treated teeth. They used 194 patient records and analyzed (vital pulp, pulp necrosis with or without lesions, and pulp retreatment with or without lesions). They obtained a success rate related to vital pulp, necrosis, and retreatment of 80.85%, failure rate was 12.76%, and 6.38% were cases with inconclusive repair.

Evaluation Period	Pain-Free Participants (n)	Pain-Free Participants (%)
24 hours	70	100%
48 hours	70	100%
2 months	70	100%
3 months	70	100%
6 months	70	100%

Table 2 – Report of pain in the postoperative period (n=70).

Source: Research data (2025).

Of 14 (29.78%) patients, only two reported postoperative pain in single-session treatment, and of a total of 33 (70.21%) patients who received treatment in multiple sessions, four patients reported post-treatment pain. They concluded that the incidence of postoperative pain and current pain of the treated elements was higher in treatments performed in multiple sessions.

Based on the work of WASKIEVICZ *et al.* (2013), they conducted a study to evaluate postoperative pain in endodontically treated teeth, regardless of the number of sessions, pulp condition, or technique used. The sample consisted of 302 patients undergoing endodontic treatment. The patients responded whether they experienced pain and its intensity. During the study period, of the 302 medical records evaluated, 30.80% experienced postoperative pain; in contrast, 69.20% experienced no pain. A percentage of 30.8%, that is, 93 patients out of 302 asked to return for follow-up had postoperative pain; of these, 82.8% (77 patients) had tolerable intensity and 17.2% (16 patients) had unbearable intensity. It was found that unbearable pain, when present, was associated with live pulp and that further research should be carried out with the intention of analyzing this additional postoperative pain. Based on the results presented in this study, it was observed that the method used in the research, along with intracanal calcium hydroxide medication, was effective in completing each endodontic treatment performed at the multidisciplinary clinic of Afya Faculdade Porto Nacional.

ROSA (2020) developed a study to compare the occurrence and intensity of pain after single- or multiple-session endodontic treatment in necropulpectomy cases and to investigate the link between patient anxiety regarding the procedure and pain perception. The total group consisted of 67 patients, with 34 in the single-session group and 33 in the multiple-session group. The inclusion criteria were being over 18 years of age, in good physical and psychological condition, and not using anti-inflammatories, analgesics, or antidepressants. Based on the results, we can conclude that the number of sessions was not related to a higher occurrence of postoperative pain. However, patients with moderate levels of anxiety showed a greater association with postoperative pain. During the follow-up period, each patient had no complaints of postoperative pain at 24 hours, 48 hours, 2 months, 3 months, and 6 months. By delving deeply into our bibliographical references for the development of this research, along with the theoretical and practical knowledge of the cited authors, along with our technique, the present study can be considered an effective method for implementing endodontic treatment in relation to postoperative pain.

SOUSA *et al* . (2021) aimed to gather data from the literature explaining the occurrence and intensity of postoperative pain in endodontic treatment, using 43 scientific articles . Painful symptoms in endodontics are reported in approximately half of cases; postoperative pain is strongly associated with endodontic treatment. The incidence of this symptom is higher in live dental pulp. Foraminal enlargement is more associated with pain. Calcium hydroxide, chlorhexidine, and antibiotic pastes were shown to be important intracanal agents, and sodium hypochlorite, chlorhexidine, and ethylenediaminetetraacetic acid were satisfactory irrigation solutions. It is concluded that all variants were associated with postoperative pain in endodontics, although they were not

significantly present, suggesting that further studies on this topic are needed.

OLIVA *et al.* (2017) focused primarily on research into postoperative pain reported by patients after treatment, using the VAS pain scale. Given complaints of postoperative pain, they began collecting data at the following time points after the procedure: time 0h, 24h, 48h, and 72h, from a total of 34 patients. A total of 14 patients were treated in a single session, and 20 patients were treated in multiple sessions. Based on the data collected, they concluded that the number of sessions does not directly affect the pain reported by patients. The study in question aimed to evaluate postoperative pain in 70 patients with necrotic and asymptomatic teeth treated at the Afya Faculdade Porto Nacional clinics. The main objective was to determine whether the interventional therapy adopted could minimize patient pain after the procedure. The pain-free result corroborates the hypothesis that the methodology, including the use of calcium hydroxide as an intracanal medication, is successful in this regard. The study adds that it is a clinical validation of a specific approach in an academic context.

ALVES *et al.* (2022) invited 99 patients to participate in this study. Postoperative pain intensity was reported and monitored after 24, 48, and 72 hours. Before starting endodontic treatment, they performed palpation, vertical percussion, and horizontal percussion tests. During the follow-up period, pain rates were low at 24, 48, and 72 hours, respectively. Furthermore, these rates decreased significantly after 72 hours. The presence of pain on palpation, the use of reciprocating files , and the use of 2.5% sodium hypochlorite influenced the results, increasing changes in postoperative pain. It was concluded that the incidence and intensity of postoperative pain monitored in the residency program significantly reduced after 72 hours. Postoperative pain was associated with pain on palpation, the use of reciprocating files , and irrigation with 2.5% hypochlorite.

Rosso *et al.* (2012) analyzed the presence of postoperative pain in infected teeth with single- and multiple-session endodontic treatment. Research was conducted in MEDLINE (Medical Parameters) cataloging sources between 1966 and February 20, 2011. They evaluated painful symptoms in live and necrotic pulps, only after single-session obturation and after intracanal medication. They concluded that teeth that received calcium hydroxide (medication) presented lower postoperative pain intensity and had higher rates of postoperative discomfort, regardless of single or multiple sessions. Overall, the study findings indicate that the specific clinical protocol adopted is a safe and predictable method for preventing postoperative pain in necrotic teeth. The main contribution of the research is to provide clinical evidence supporting the use of calcium hydroxide as an intracanal medication for pain control, offering a practical counterpoint to the complexity and, at times, lack of consensus found in the scientific literature on the subject.

FINAL CONSIDERATIONS

It is possible to conclude from this study that the endodontic treatment performed at ITPAC- Porto Nacional presents favorable results and absence of postoperative pain.

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