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The Effect of the Design of the Irrigation Needle Used During Endodontic Treatment on Postoperative Pain: A Randomize Clinical Trial

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Abstract

Objective: The aim of this study is to evaluate the effect of irrigation needles with different designs on postoperative pain during endodontic treatment
Method: This randomized clinical study was conducted on 66 patients with symptomatic irreversible pulpitis of the mandibular molars. The patients were divided into 3 groups according to the design of the irrigation needle used during root canal treatment. Open-ended irrigation needle was used in group 1, side-port closed-ended irrigation needle was used in group 2, and double side-port closed-ended irrigation needle was used in group 3. After completion of root canal treatment, preoperative and postoperative pain levels were evaluated at 6, 24, 48, 72 hours and 7 days. The data were analyzed by the Pearson chi-square test and Fisher's exact tests.
Results: Postoperative pain was highest at 6 hours in all groups. A significant decrease in pain over time was observed in all groups ($p < 0.05$). No statistically significant differences in postoperative pain were found between the groups at any time point ($p > 0.05$).
Conclusion: The design of irrigation needles used during endodontic treatment does not appear to affect postoperative pain levels.
Key words: side-vented needle, conventional needle irrigation, irrigation needle design, postoperative pain

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Clinical trial registration: Registration number is "NCT07080918" .

Introduction

Root canal treatment is performed to manage pulpal and periapical diseases and to restore long-term comfort while preventing reinfection. This requires proper shaping, cleaning, obturation, and restoration of the canal system (1). However, complete removal of pulp tissue—especially in complex anatomical areas such as isthmuses, apical deltas, and canal irregularities—may be difficult, and residual microorganisms may persist despite instrumentation, making mechanical preparation alone insufficient for effective disinfection (2).

Effective irrigation is essential in root canal treatment to eliminate microorganisms and remove organic tissues, debris, and the smear layer.(3)Although various activation techniques exist, conventional needle irrigation remains the most widely used method. Its effectiveness largely depends on the depth and design of the needle, which can influence solution distribution, the risk of apical extrusion, and potential postoperative symptoms.(4,5)

Postoperative pain experienced after root canal treatment is an important problem that affects quality of life. During root canal therapy, the apical extrusion

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of pulp remnants, debris, or irrigation solutions can cause inflammation in the periapical tissues, leading to postoperative pain.(6,7,8) Studies(9,14) investigating different irrigation needle designs have shown that open-ended needles generate greater apical pressure, and one study(10) found that open-ended needles also result in increased apical extrusion of debris. Although *in vitro* studies examining the effects of different needle designs on apical extrusion have been published, there are no clinical studies investigating the effects of needle designs on postoperative pain in permanent teeth. It is necessary to investigate the effects of different irrigation needle designs used during endodontic treatment on postoperative pain to increase patient comfort and to develop more effective treatment protocols. Thus, this study aimed to compare the effects of different irrigation needle designs used during endodontic treatment on postoperative pain and to provide information on which needle designs may be more advantageous in clinical applications. The null hypothesis of our study is that irrigation needles with different designs used during endodontic treatment have no effect on postoperative pain.

Methods

Study design and ethical aspects

This study was designed as , randomized, single-blind clinical trial. This study was approved by the Clinical Research Ethics Committee of the Faculty of Medicine, Akdeniz University (143/2024), and registered at ClinicalTrials.gov (NCT07080918) on 22 July 2025. We used the CONSORT checklist when writing our report. The study adhered to the Declaration of Helsinki principles, and all participants provided a written and signed inform consent to participate in the trial.

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Participants

This study included patients aged 18–65 years who were diagnosed with symptomatic irreversible pulpitis in their mandibular molars and underwent a root canal treatment at the Endodontics Clinic of Akdeniz University Faculty of Dentistry between January 2024 and January 2025. Each patient was given a postoperative pain assessment form to indicate their pain levels at various times after the treatment. These forms were returned at the 7-day follow-up.

Sample Size calculation

The sample size was calculated *a prior* using G*Power 3 after examining relevant reference articles and sample studies.(11) Considering a 95% confidence level, 80% power, and an effect size of 0.4, each group would need to have at least 20 teeth. To address potential loss to follow, each group included 22 teeth.

Randomization and allocation concealment

Randomization was performed using computer-generated random sequence (www.randomization.com), it was conducted by an independent individual with no involvement in the study procedures. Allocation numbers were prepared and placed into opaque, sealed envelopes to ensure allocation concealment. The envelopes were opened immediately prior to needle insertion

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and irrigation. All participants received information regarding the study; however, they were blinded to their assigned intervention group. The clinician was informed of which needle to use at the irrigation stage. All treatments were performed by the sama clinician. Also due to the nature of the interventions, the operator could not be blinded. The data collector was also blinded.

Inclusion and exclusion criteria

The inclusion criteria were:

- Healthy patients aged 18–65 years;
- Patients with a preoperative pain score from moderate to severe (i.e., 4–10), measured with a visual analogue scale (VAS, ranging from 1 to 10);
- The teeth had an exacerbated and prolonged response to the cold thermal test,
- The mandibular molar diagnosed with symptomatic irreversible pulpitis.
- The mandibular molars with three canals

The exclusion criteria were:

- Patients with systemic diseases;
- Pregnancy or lactation;
- Teeth with no pulp vitality
- Teeth with periapical lesions;
- Teeth that had previously undergone a root canal treatment;
- Teeth with calcified canals;
- Teeth with periodontal diseases;
- Teeth sensitive to percussion and palpation;
- Teeth with bruxism/traumatic occlusion;
- Teeth with crown or root fractures;
- Teeth with internal or external resorption;
- Teeth with an immature/open apex;
- Patients who had taken antibiotics in the last two weeks;
- Patients who had taken analgesic or anti-inflammatory drugs within the last 12 hours;
- Patients who did not sign the consent form or return the follow-up form recording their postoperative pain.

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Treatment Procedure

Each root canal treatment was performed by a single dentist at the endodontics clinic of the Akdeniz University Faculty of Dentistry. The age, gender, systemic diseases, root canal structure, periapical condition, irrigation needle design used during endodontic treatment, and pre- and post-treatment pain severity of the patients included in the study were obtained from the patient records and follow-up forms.

Before the procedure, each patient's medical and dental histories were taken, and the preoperative pain level was recorded with a VAS. Each patient received an inferior alveolar nerve block using 2 ml of a local anaesthetic solution (Ultracain D-S forte, Sanofi, France) containing 80 mg of articaine hydrochloride and 0.024 mg of epinephrine hydrochloride. After the teeth were isolated with a rubber dam, caries and any existing restorations were removed using diamond burs, and a standard endodontic access cavity was prepared.

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To determine the canal length, #10 K-type (Perfect, China) hand files were used. The working length was determined with an electronic apex locator (Woodpecker, Endo Radar Pro, China) and confirmed radiologically.

The root canal was prepared using an endodontic motor (Woodpecker, Endo Radar Pro) and a nickel-titanium rotary instrument system (Scope Endodontic System, Turkey) at a speed of 300 rpm and a torque of 2 N/cm. Apical preparation was completed to a size three times larger than the initial apical file. During the shaping procedure, when apical resistance was encountered, excessive torsional loading was prevented by removing the files from the canal, cleaning the debris from the files, and irrigating the root canal.

During shaping, the root canal was rinsed with 2 ml of 2.5% sodium hypochlorite (NaOCl) after each file change, followed by recapitulation with a #10K file. After preparation was completed, each canal was rinsed with 5 ml of 2.5% NaOCl, and the NaOCl solution was activated using an endoactivator (three 20-s cycles). Next, 5 ml of distilled water was applied to remove NaOCl residues from the canal. Then, 2 ml of 17% EDTA (Endo-Solution, Cerkamed, Poland) was applied for 1 min. The EDTA residue was neutralised by irrigating each canal with 5 ml of distilled water.

The irrigation procedure was performed with needles of different designs(figure 2), each 30G:

- **For group 1**, an open-ended notched irrigation needle (Endo-Top, Cerkamed) was used.
- **For group 2,** a closed-ended single orifice irrigation needle (Scope Endo Fx Ject, Turkey) was used
- **For group 3**, a closed-ended double orifice irrigation needle (Double Sideport, Raito, China) was used.

The irrigation needles were 2 mm shorter than the working length.

Each root canal was shaped using appropriate paper points (Meta Biomed, Korea). It was filled with gutta-percha (Diadent Group International, Canada) and epoxy resin-based root canal paste (Dentac, Turkey) using the lateral condensation technique. The permanent restoration was completed with a light-cured composite (Coltene Whaledent Brilliant Ng, Switzerland), and occlusal interferences were identified and adjusted accordingly. The patients were prescribed 400 mg of ibuprofen and advised to use it when absolutely necessary’.

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Evaluation of postoperative pain

The patients were given a postoperative pain assessment form that included a VAS to evaluate their postoperative pain levels. They were asked to record their pain levels and analgesic usage on the provided form at 6, 24, 48, and 72 h and 7 day after their root canal treatment. The patients attended a follow-up session 7 days after their treatment, at which time the forms were collected.

Outcomes

The primary outcome of the study was the comparison of postoperative pain intensity, measured using the VAS, among the three groups at 6, 24, 48, and 72 hours, and on day 7. The secondary outcomes included the effects of gender, age, and tooth number on postoperative pain, as well as the timing and total

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consumption of analgesics within and between groups. All outcomes were assessed according to predefined protocols, and patients were instructed to report analgesic intake and pain levels at each follow-up time point.

Statistical analysis

IBM SPSS Statistics 23.0 was used to statistical analysis. The data are presented with descriptive statistics, namely the frequency, percentage, mean, standard deviation, median, minimum, and maximum. The Mann–Whitney U test was used to analyse differences in numerical data between two groups. The Kruskal–Wallis H test and one-way analysis of variance were used to analyse differences in numerical data among three or more groups. The Pearson chi-square test and Fisher's exact test were used to analyse differences in categorical data. The Friedman test was used to examine differences between time-dependent measurements. When the specific test returned a significant result, the Bonferroni–Dunn procedure was applied for pairwise comparisons. A p-value < 0.05 was considered to indicate a statistically significant difference.

Results

Our study analyzed patients diagnosed with symptomatic irreversible pulpitis who presented to the Endodontics clinic at Akdeniz University Faculty of Dentistry and underwent root canal therapy on their mandibular molars. A total of 66 patients were included in the evaluation, with 22 in each group (Figure 1). The distribution of patients included in the study by gender and their mean ages are presented in Table 1. There was no statistically significant difference regarding gender distribution and mean age between the groups ($p > 0.05$).

When the effect of gender on pain levels was evaluated independently of the groups, a statistically significant difference was found only for preoperative pain ($p < 0.05$). Preoperative pain intensity was higher in women. However, gender did not have a significant effect on postoperative pain at other time intervals ($p > 0.05$) (Table 5).

The distribution of tooth numbers evaluated in the study across groups is presented in Table 3. No statistically significant difference was found in postoperative pain levels with respect to tooth numbers ($p > 0.05$) (Table 4). No statistically significant difference in postoperative pain was found between the groups at any time point ($p > 0.05$). The time-dependent change in postoperative pain levels was statistically significant within all groups ($p < 0.01$). Postoperative pain was highest at 6 hours in all groups, whereas by day 7, almost no pain was reported. The preoperative and postoperative pain levels of the groups are presented in Table 2 and Figure 3. *A statistically* significant decrease in analgesic use was observed within all groups ($p < 0.05$). However, no statistically significant difference in analgesic use was found between the groups at any time interval ($p > 0.05$). The distribution of analgesic use across groups is presented in Table 1 and Figure 4. Regardless of group, no statistically significant difference in analgesic use was observed between genders at any time point ($p > 0.05$) (Table 6).

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Discussion

During root canal treatment, traditional needle irrigation is the most commonly used method, and needle design can affect solution distribution, the risk of apical extrusion, and postoperative symptoms. (5)Although previous studies have generally compared needle irrigation with other methods, the effect of different needle designs on postoperative pain has not been investigated.(12-15)In our study, no significant differences were found between the groups, supporting the null hypothesis.

The denser trabecular structure of the lower jaw compared with the upper jaw can lead to reduced blood flow and delayed healing, resulting in more postoperative pain. Additionally, it has been reported that the level of postoperative pain increases as the teeth are positioned from anterior to posterior (16,17). To prevent potential differences in postoperative pain levels due to the position of the teeth in the lower or upper jaw, we only examined mandibular molars in the lower jaw.

As the NaOCl concentration increases, the effectiveness of the solution, particularly its tissue-dissolving capacity, also increases (18,19). While Demenech et al. (20) concluded that using NaOCl at different concentrations did not significantly affect postoperative pain, Vitali et al. (21) reported that the use of 2.5% NaOCl caused less postoperative pain compared with the use of 8.25% NaOCl. We used 2.5% NaOCl and 17% EDTA to minimise complications in case of possible extrusion, and we applied the irrigation solution protocol uniformly to all teeth.

Traditional needle irrigation is one of the most preferred irrigation methods by dentists (22). The effectiveness of this method can be influenced by factors such as the depth at which the needle is placed in the root canal, the diameter of the needle, and its design (4,23). As the diameter of the irrigation needle decreases, the flow rate also decreases (24,25). A smaller irrigation needle diameter allows for the needle to be positioned more apically. Therefore, the use of relatively small-diameter irrigation needles has been recommended (19,25). Given that there are published studies on postoperative pain when using 30G irrigation needles (22–24), we used 30G irrigation needles for all patients in the present study.

Increasing the depth at which the irrigation needle is placed in the root canal improves the cleaning and disinfection of the root canal system, but it also increases the risk of extrusion of the irrigation solution into the periapical region (26). Boutsioukis et al. (4) evaluated the effect of irrigation needle depth on solution flow and recommend using closed-end irrigation needles 1 mm shorter than the working length and open-end irrigation needles that were 2–3 mm shorter than the working length. They did not recommend placing open-ended needles that were 1 mm shorter than the working length due to high apical pressure (4). In two studies evaluating the effect of different irrigation methods on postoperative pain, the authors used a closed-tip double-holed irrigation needle in the traditional needle irrigation group, and they used a needle that was 2 mm shorter than the working length (15,4). There are also studies on postoperative pain using a closed-end single-hole irrigation needle for traditional needle irrigation. In a few of these studies (14,23), irrigation was performed with a needle that was 2 mm shorter than the working length, while in others (27,28), irrigation was performed with a needle that was 1 mm shorter than the working length.

The effectiveness of an irrigation solution is thought to be limited when it is used alone during a root canal. Solution activation is more effective in removing pulp and hard tissue debris (4,29). Some studies have reported that patients

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treated with an endoactivator (to activate the solution) experienced less postoperative pain compared with patients treated with traditional needle irrigation (9,24). However, Kumar et al. (30) reported no significant difference between these treatment approaches. We used an endoactivator for all treatments to apply a standardised procedure and to ensure the patients could benefit from solution activation.

An issue with pain evaluation is its subjective nature – that is, the patient is responsible for rating their pain. Therefore, the design of the pain assessment form is important: it should be easily understood by the patients and interpretable by the researchers (31,32). There are various methods used to measure and assess pain levels. In our study, we used a VAS (100 mm), ranging from 0 to 10, to measure pain intensity. This scale is easily understood by patients and provides reliable and valid results when used appropriately. It has been used extensively in previous endodontic studies to assess postoperative pain (8,9,33). We provided each patient with a detailed explanation regarding when and how to document their pain with the VAS, ensuring accurate postoperative pain recording.

There is no consensus as to whether there is a gender-specific difference in postoperative pain levels. While some studies indicate that female patients are more sensitive to pain (34,35), others have found no difference between the genders (36). In our study, postoperative pain did not differ between the genders.

Pain (unpleasant sensations) can occur after a root canal treatment commences and can be quite high by the end of the procedure (37). Pain usually decrease from moderate within 1 day after a root canal treatment to minimal within 7 days (38) – a pattern supported by many published studies (12,13,23). Consistently, we noted a significant decrease in pain levels over time for all three groups.

In two *in vitro* studies comparing the effect of closed-end and open-end irrigation needles on apical extrusion (all needles were 3 mm shorter than the working length), there was greater debris extrusion in the patients treated with open-end needles (10,39). Two *in vitro* studies reported similar debris extrusion when using a closed-end double-orifice or single-orifice irrigation needle, but lower debris extrusion compared with the use of an open-end irrigation needle (40,41). We found no significant difference in postoperative pain between the double- and single-hole groups, nor between the open-ended group and the other groups. We think that the lack of a significant difference between the groups may have resulted from the normal periapical structures observed in the teeth included in our study—irreversible pulpitis cases without periapical pathology—which may prevent the extrusion of solution and debris (23), as well as from the fact that in vitro studies cannot fully replicate clinical conditions .

Topçuoğlu et al. (42) examined the effect of using different irrigation needle designs during pulpectomy in primary teeth on postoperative pain. They reported that open-ended irrigation needles resulted in greater postoperative pain compared with closed-ended single-hole irrigation needles at 6, 12, and 24 h after the treatment. However, there was no significant difference between the needle designs at 48 and 72 h and 7 days after the treatment. Differently, in our study there were no significant differences in postoperative pain between the groups at any time. The difference between the studies could be due to the anatomical differences of deciduous teeth from permanent teeth in terms of size and external and internal morphology (43).

Based on the literature, the use of analgesics is most intense within the first 24 h following a procedure and decreases over time (13,14). Consistently, we observed the highest use of analgesics with the first 6 h and 6–24 h after the root canal treatment. Moreover, there was no analgesic use after 48 h. Analgesic use did not differ significantly between the groups. Note that it is impossible to

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control all potential sources of pain, so despite taking precautions (14), it is unclear whether the pain the patients experienced was due to the root canal treatment.

This study has some limitations that need to be acknowledged. The presence of postoperative pain after root canal treatment can be related to apical trauma due to excessive instrumentation and extrusion of materials into the periapical tissues. However, pain can also develop as a result of damage to the soft tissues from the application of a rubber dam and injection of the local anaesthetic. These factors are limitations of studies evaluating postoperative pain following root canal treatment (29,14). The other limitation of this study is the use of a VAS which may not fully capture the subjective nature of pain. Therefore, future studies may evaluate pain using additional biomarkers alongside conventional pain scales. Additionally, the dentist who performed each root canal treatment was not blind to the irrigation needle design.

Within the limitations of our study, it can be concluded that needle design does not have a clinically significant effect on postoperative pain or analgesic requirements when performing treatment on teeth with irreversible pulpitis. In such cases, the selection of the irrigation needle should be based on ease of use and accessibility. On the other hand,the highest level of postoperative pain was observed at the 6th hour. Patients can be informed that they may experience postoperative pain on the first day. Future clinical studies with larger sample sizes, incorporation of relevant biomarkers, and investigation of different irrigation needles under various pulpal and periapical conditions are warranted to confirm these findings

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Data Availability

All data are available upon reasonable request to the corresponding author.

Conflicts of interest/Competing interests

The authors declare they have no financial interests
The authors have no conflicts of interest to declare that are relevant to the content of this article.

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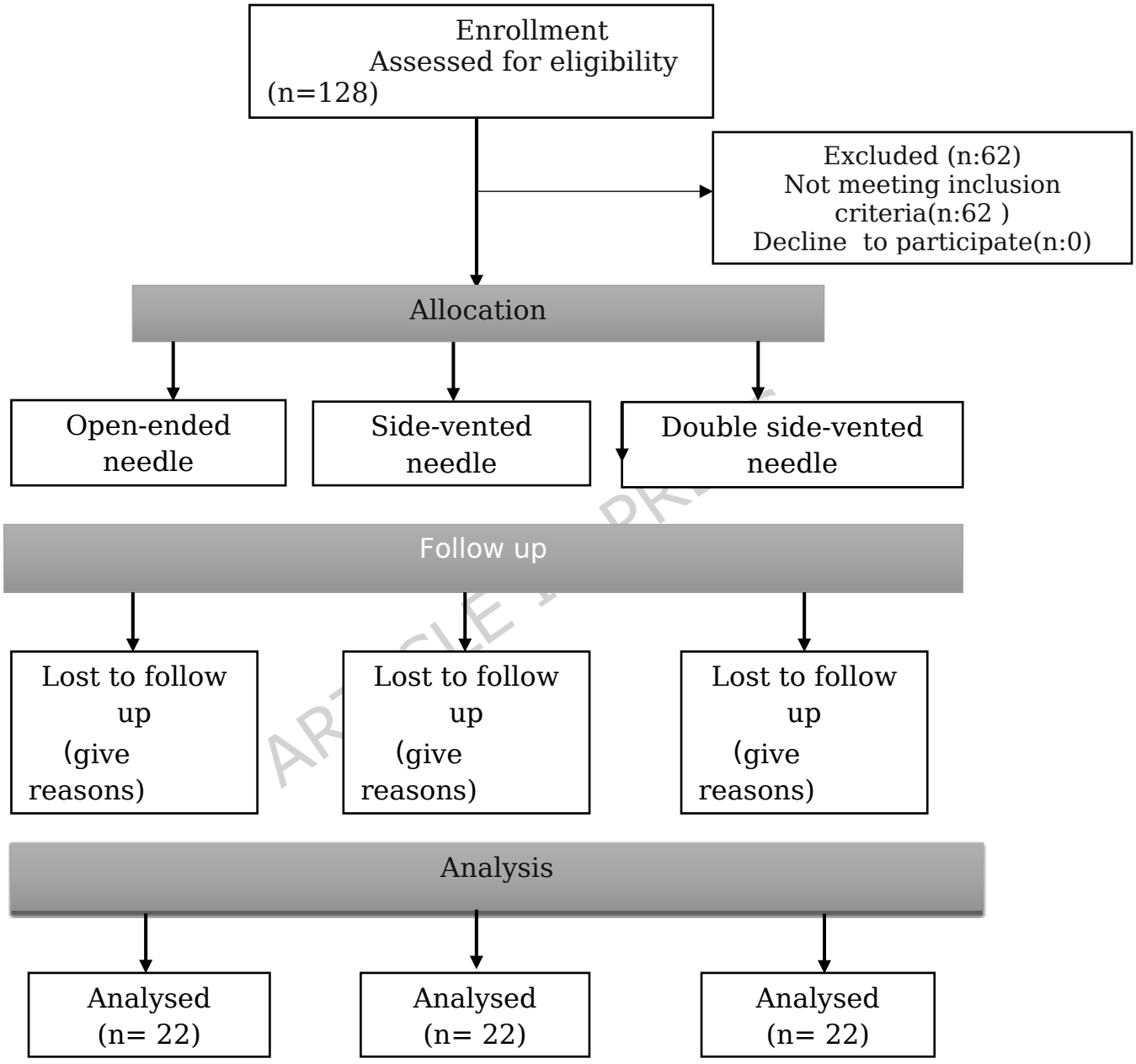
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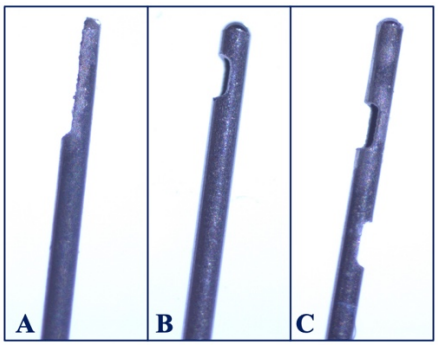
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Figure 1. Flow diagram CONSORT for randomized clinical trials



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Figure:2 Images of the irrigation needle tips used in the study under a stereomicroscope: (A) Open-ended notched irrigation needle, (B) Closed-end single-hole irrigation needle, (C) Closed-end double-hole irrigation needle. (2.5× Magnification)



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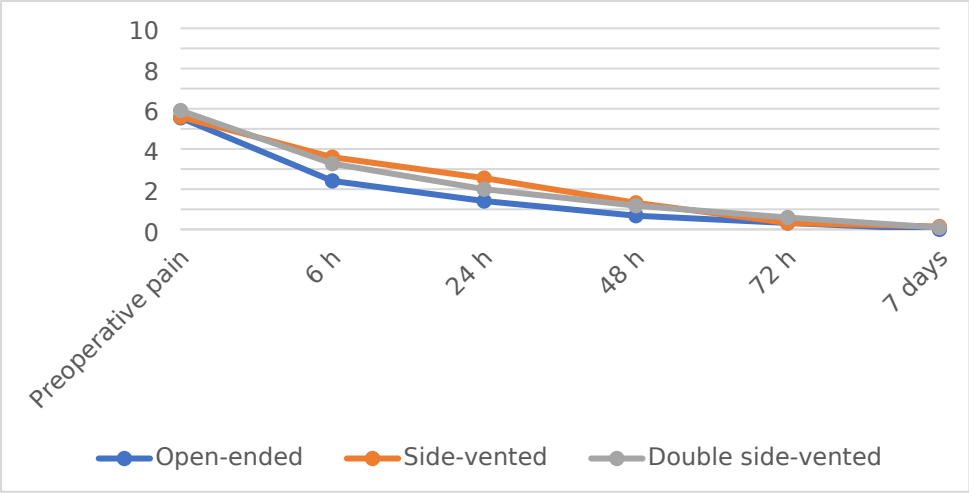


Figure 3. The variation in the mean pain levels of the groups over time

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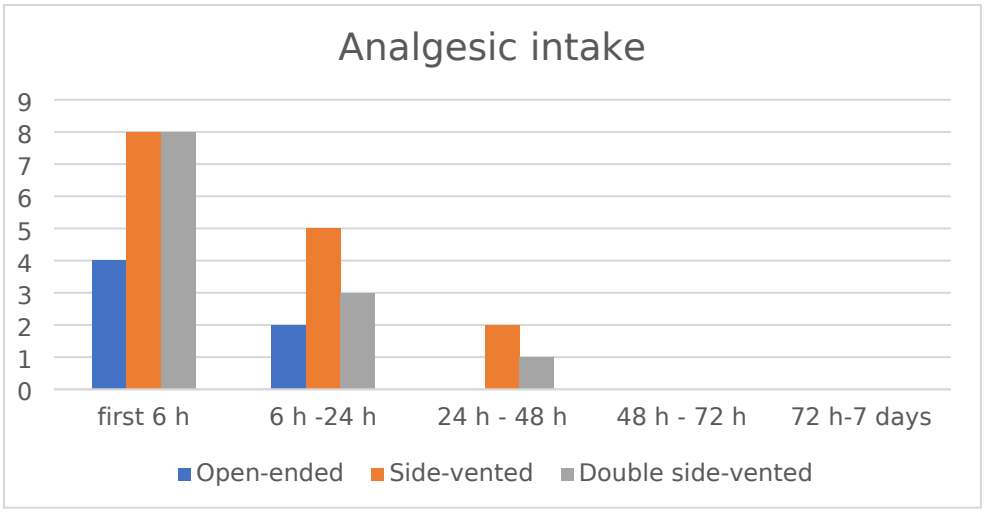


Figure 4.. Distribution of analgesics taken by groups

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Table 1. Distribution of groups by gender, age and analgesic intake

		Open-ended	Side-vented	Double side-vented	Total	P value
Gender	Female(%)	13 (59,1)	14 (63,6)	16 (72,7)	43 (65,2)	0,627*
	Male(%)	9 (40,9)	8 (36,4)	6 (27,3)	23 (34,8)	
Age (years)		39,12 ± 12,06	37,64 ± 11,68	35,82 ± 13,71	37,59 ± 12,41	0,652*
Analgesic intake	First 6 h	4	8	8	20	0,317*
	6h - 24 h	2	5	3	10	0,578*
	24 h - 48 h	0	2	1	3	0,767*
	48 h – 72 h	0	0	0	0	-
	72 h -7 days	0	0	0	0	-

*not statistically significant (*p* value less than 0.05 considered statistically significant)

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Table 2. I Pain intensity values summarized as median (interquartile range, IQR) across study timepoints.

	Open-ended			**Side-vented**			**Double side-vented**			**P of intergroup comparison**	**Effect size**	**95%CI effect size**	
	Median	n	IQR	Median	n	IQR	Median	n	IQR			Lower bound	Upper bound
Preoperative pain	4,50	22	3,75	6,00	22	2,5	5,00	22	2,75	0,523 (NS)	-0,011	-0,12	0,10
Postoperative pain at 6 h	3,00	22	3,75	3,50	22	6,75	3,00	22	4,25	0,521 (NS)	-0,011	-0,11	0,12
Postoperative pain at 24 h	0,50	22	2,0	2,00	22	4,0	0,50	22	4,00	0,369 (NS)	-0,0001	-0,09	0,09
Postoperative pain at 48 h	0,00	22	0,75	0,00	22	1,75	0,00	22	1,75	0,454 (NS)	-0,006	-0,10	0,11
Postoperative pain at 72 h	0,00	22	0,00	0,00	22	0,00	0,00	22	0,75	0,555 (NS)	-0,013	-0,12	0,12
Postoperative pain at 7 days	0,00	22	0,00	0,00	22	0,00	0,00	22	0,00	0,362 (NS)	0,0005	-0,08	0,09
P value of intragroup comparison	Pre×6h**:**0,000 **(**significant**)** 6h×24h:0,000 **(**significant**)** 24h×48h:0,006 **(**significant**)** 48h×72h:0,058 (NS) 72h×7days:0,065 (NS)			Pre×6 h:0,008 **(**significant**)** 6h×24h:0,039 **(**significant**)** 24h×48h:0,001**(**significant**)** 48h×72h:0,01 **(**significant**)** 72h×7days:0,285 (NS)			Pre×6h:0,001 **(**significant**)** 6h×24h:0,043 **(**significant**)** 24h×48h:0,024 **(**significant**)** 48h×72h:0,070(NS) 72h×7 days:0,039**(**significant**)**						

CI: Confidence interval, IQR: Interquartile range, NS: Nonsignificant

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Table 1. Distribution of tooth numbers by groups

	Open-ended		**Side-vented**		**Double side-vented**		**Total**	
Tooth number	N	%	N	%	N	%	N	%
36	6	27,3%	6	27,3%	9	40,9%	21	31,8 %
37	5	22,7%	6	27,3%	2	9,1%	13	19,7 %
46	1	4,5%	5	22,7%	7	31,8%	13	19,7 %
47	10	45,5%	5	22,7%	4	18,2%	19	28,8 %
Total	22	100%	22	100%	22	100%	66	100 %

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Table 4. Mean and standard deviation values of preoperative and postoperative pain levels at different time intervals according to tooth numbers, and average ages

	36		**37**		**46**		**47**		**P value**
	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median	Mean ± SD	Median	
Age (years)	34,57±12,47	34	42,92±12,19	46	32,23±11,03	30	40,95±11,79	41	0,057
Preoperative pain	5,62±1,56	5,00	5,69±1,65	5,00	5,69±1,84	5,00	5,74±1,73	6,00	1,000
Postoperative pain at 6 h	3,57±2,68	3,00	2,38±2,02	2,00	3,08±2,87	3,00	3,05±3,08	3,00	0,779
Postoperative pain at 24 h	2,43±2,50	2,00	1,38±1,33	1,00	2,31±2,90	0,00	1,68±2,38	0,00	0,746
Postoperative pain at 48 h	1,57±2,42	1,00	0,31±0,63	0,00	1,31±1,93	0,00	0,84±1,61	0,00	0,244
Postoperative pain at 72 h	0,43±0,87	0,00	0,15±0,55	0,00	0,92±1,55	0,00	0,21±0,71	0,00	0,153
Postoperative pain at 7 days	0,10±0,44	0,00	0,23±0,60	0,00	0,00±0,00	0,00	0,00±0,00	0,00	0,180

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Table 5. Mean and standard deviation values of preoperative and postoperative pain levels at different time intervals according to gender, and average ages

	Female		Male		P value
	Mean ± SD	Median	Mean ± SD	Median	
Age (years)	37,19±12,64	37	38,25±12,21	41	0,757
Preoperative pain	5,98 ± 1,67	6,00	5,13 ± 1,49	4,00	0,030
Postoperative pain at 6 h	3,23 ± 2,74	3,00	2,83 ± 2,66	3,00	0,599
Postoperative pain at 24 h	1,98 ± 2,33	2,00	2,00 ± 2,45	1,00	0,927
Postoperative pain at 48 h	1,02 ± 1,88	0,00	1,13 ± 1,89	0,00	0,808
Postoperative pain at 72 h	0,51 ± 1,08	0,00	0,22 ± 0,74	0,00	0,126
Postoperative pain at 7 days	0,12 ± 0,45	0,00	0,00 ± 0,00	0,00	0,198

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Table 6. The situation of analgesics taken by gender

	Female	**Male**	**P value**
First 6 h	10 (%23,3)	10 (43,5)	0,088*
6 h – 24 h	7 (%16,3)	3 (%13)	0,999 **
24 h – 48 h	3 (%7)	0 (%0)	0,546 **

*Pearson Chi-Square Test, **Fisher's Exact Test

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