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Original Research Article

Comparison of Post-Obturation Pain between Single and Multiple Visit Root Canal Treatment

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ABSTRACT

Aim: This study was conducted to compare the incidence of post-obturation pain after single-and multiple-visit root canal treatment (RCT).
Materials & Methods: The study was conducted in Umm-Al Qura University Hospital. The selected patients were systemically free of any disease. Offending teeth tender to touch were excluded.
The sample size was determined as 40, divided according to number of visits of RCT into two groups, Group I: single visit RCT cases, Group II: cases where RCT was completed in multiple visits.
The relevant features and conditions of each case were recorded from the patient's files in the endodontic chart adjusted for the study
Following adequate chemo-mechanical instrumentations and obturation, a visual analogue pain scale was given to each patient to record pain immediately post operative and after 6, 12, 24 hours.
Results: Incidence of severe-pain in group I was 85% immediately postoperatively and 80% in group II while 6 hours postoperatively 90% of both groups experienced pain. After 12 hours 75% of group I and 60% of group II experienced pain and after 24 hours postoperatively 55% of group I experienced pain in contrast to 60% in group II
Conclusion: Under the limitations of this study it was concluded that Post-obturation pain is likely to occur in the first 24hr and it further reduces as time passes. The intensity of post-obturation pain experienced following single- or multiple-visits RCT were not significantly different

Keywords: Post-obturation pain, Single visit, Multiple visit, Root canal treatment.

INTRODUCTION

Pain is considered one of the major problems in dentistry, Loeser JD 2008 *et. Al* [(1)] defined pain as 'Displeasing sensation accompanied with real or possible tissue damage' post-obturation pain is the main concern to Endodontics whether adequate anesthesia is given or not. A successful endodontic treatment is obtained when there is an omission or decreasing in the post-obturation pain, some clinical studies concluded that there were different amounts of pain extent from 25% to 40%. [(2-5)]

In comparison between single-visit root canal treatment over multi-visit root canal treatment in their advantages single-visit root canal treatment have the advantage of reducing the number of mechanical procedures and time, elimination of the bacterial seepage between appointments through provisional restorations and flare-up rate, more suitable to the travelling and busy patient as well as it's inexpensive.

Meanwhile, completion of root canal treatment in single-visit or multi-visit is still

controversial if it's going to make any variation in the clinical and radiographic outcomes or the possibility of complexities, so the present study was carried out to compare the post-obturation pain after single and multiple visits root canal treatment

Aim of the Work

This study was conducted to compare the incidence of post-obturation pain after single-and multiple-visit root canal treatment (RCT).

MATERIALS AND METHODS

Selection of the patients:

The study was conducted in Umm-Al Qura University Hospital and king Faisal hospital "shisha- Makkah". Patients were recruited from the regular pool of patients visiting Umm-Al Qura University Hospital and King Faisal hospital "Shisha- Makkah" for their conventional endodontic treatment during the period of the investigation.

Inclusion criteria:

The selected patients were systemically free of any disease, had no allergic reactions and between 20-45 years of age.

Exclusion criteria:

- Pregnant females, patients taking antibiotics or corticosteroids at the time of treatment, immune-compromised patients, patients with complicating systemic disease, or under 20 and above 45 years of age were excluded.
- Offending Teeth tender to touch, with extensive intracanal calcifications or incompletely formed apices were excluded.

Sample Size:

The sample size was determined as 50.

Grouping of the patients:

Patients were divided according to number of visits of RCT into two groups, each of 25 patients.

Group I: single visit RCT cases.

Group II: cases where RCT will be completed in multiple visits.

Procedures

The relevant features and conditions of each case were recorded from the patient's files in the endodontic chart adjusted for the study. These included: the tooth type, the number of roots, any history of pre-operative pain preceding the first treatment session, pulpal sensitivity, and the presence of periapical radiolucency in periapical radiographs.

Post-obturation Pain measurement

Following adequate chemo-mechanical instrumentations and obturation, [(2)] a visual analogue pain scale [(6)] was given to each patient after modification to record pain immediately post operative and after 6, 12, 24 hours. All patients were instructed to take analgesics only if they experienced pain. The patients had to record the maximum pain level before they take the analgesics

Visual analogue scale

The patient's mark on the horizontal scale represented the intensity of pain experienced at the selected time according to the following criteria:

1) No pain: the treated tooth felt normal.
2) Slight pain: the tooth involved was slightly painful for a time, regardless of the duration, but there was no need to take analgesics.
3) Moderate pain: the tooth involved caused discomfort and/or pain, which was either tolerable or was rendered tolerable by analgesics.
4) Severe pain: the pain caused by the treated tooth disturbed normal activity or sleep and analgesics had little or no effect.

RESULTS

Ten patients were excluded from the analysis of the results, as they did not submit the pain scale they were given. Of the remaining forty patients, twenty patients were treated in a single visit (Group I) and twenty patients were treated in multiple visits (Group II).

The overall post-operative pain immediately after RCT and during the follow-up period of, 6 h, 12 h and 24 h was

assessed according to patient's record in the modified VAS. (Table 1-2)

Group I:

The percentage of pain intensity in group I single-visit RCT is shown in table 1, figure 1. Where (15%) of the patients (n=3) had no pain, and (40%) of the patients (n=8) experienced severe pain immediately after obturation, after 6 hours (10%) of the patients (n=2) had no pain and only (5%) patients (n=1) experienced severe pain, after 12 h (25%) of the patients (n=5) had no pain, and only (5%) of the patients (n=1) experienced severe pain, while after 24 hours (45%) patients (n=9) had no pain, and no patients experienced severe pain (Table 3, fig.1).

Table 1: Patients marks on the (VAS) of group I

Patient number	Immediately	After 6	After 12	After 24
1	0	6	6	6
2	5	2	0	0
3	1	1	1	1
4	2	5	0	0
5	2	0	0	0
6	2	0	0	0
7	6	4	2	0
8	2	1	1	0
9	6	3	1	0
10	7	6	5	3
11	7	8	7	5
12	8	4	2	2
13	7	5	5	3
14	7	5	4	4
15	7	5	3	2
16	7	6	5	4
17	8	6	5	3
18	5	2	1	1
19	0	1	0	0
20	0	2	1	0

Table 2: Patients marks on the (VAS) of group

Patient number	Immediately	After 6	After 12	After 24
1	0	2	0	0
2	4	5	3	0
3	5	0	0	0
4	2	1	0	0
5	0	2	0	2
6	3	2	0	0
7	1	2	0	0
8	2	2	0	0
9	10	8	8	6
10	9	8	7	5
11	6	4	4	2
12	7	6	6	4
13	6	7	6	6
14	9	7	6	5
15	0	1	5	2
16	9	5	2	2
17	7	5	5	4
18	4	1	4	1
19	7	7	4	8
20	0	0	0	0

Group II:

Immediately after obturation, (20%) of the patients of this group (n=4) and (35%) of the patients (n=7) experienced severe pain, after 6 h postoperatively only (10%) of the patients (n=2) had no pain, and (25%) of the patients (n=5) experienced severe pain, 12 h postoperatively (40%) of the patients (n=8) had no pain, and only (10%) of the patients (n=2) experienced severe pain, while after 24 h (40%) of the patients (n=8) had no pain, and only (5%) of the patients (n=1) experienced severe pain (table 4, fig.2) .

Table 3; The percentage of postoperative pain intensity in group I (single-visit RCT) at all study intervals

Time Intensity of pain	Immediately	After 6h	After 12h	After 24h
No	15%	10%	25%	45%
Mild	25%	35%	40%	35%
Moderate	20%	50%	30%	20%
Severe	40%	5%	5%	0%

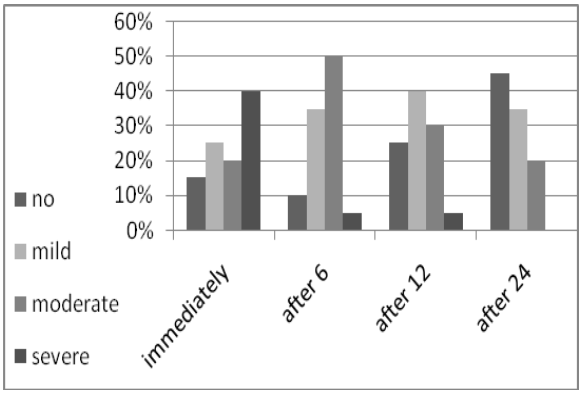

Fig.1 A bar chart showing the percentage of postoperative pain intensity in group I single-visit RCT at all study intervals

Table 4: The percentage of postoperative pain intensity in group II (multiple-visit RCT) at all study intervals

Time Pain incidence	Immediately	After 6h	After 12h	After 24h
No pain I	15%	10%	25%	45%
No pain II	20%	10%	40%	40%
Pain I	85%	90%	75%	55%
Pain II	80%	90%	60%	60%

The incidence of pain in both groups was shown in table 5, figure 3. Where (85%) of the patients of group I (n=17) experienced pain in contrast to 80% in group II (n=16) immediately after obturation. 6 hours postoperatively (90%) of the patients of both groups (n=18) experienced pain, after 12 hours (75%) of the patients of group I (n=15) and (60%) of the patients of group II (n=12) experienced

pain. After 24 hours postoperatively (55%) of the patients of group I (n=11) experienced pain in contrast to (60%) in group II (n=12).

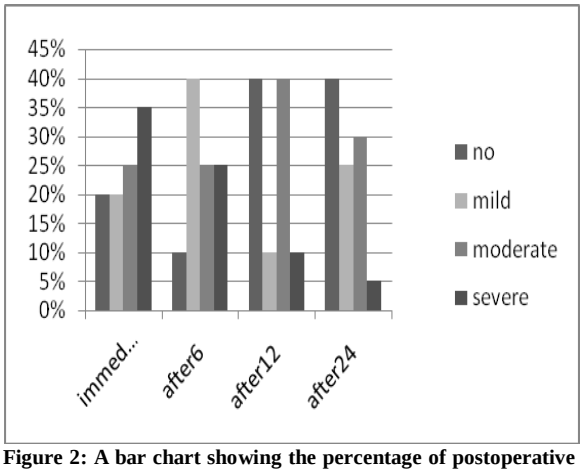

Figure 2: A bar chart showing the percentage of postoperative pain intensity in group II (multiple-visit RCT) at all study intervals

Table 5: The incidence of pain in both groups (I and II)

Time Intensity of pain	Immediately	After 6h	After 12h	After 24h
No	20%	10%	40%	40%
Mild	20%	40%	10%	25%
Moderate	25%	25%	40%	30%
Severe	35%	25%	10%	5%

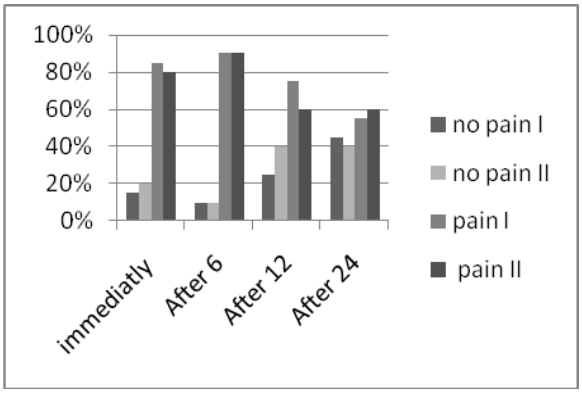

Figure 3: A bar chart showing the incidence of pain in both groups (I and II)

Table 6: The pain immediately, after 6, after 12 and after 24 effect on both single and multi-visits RCT

	Immediately	After 6hr.	After 12hr.	After 24hr.
	mean ± SD	mean ± SD	mean ± SD	mean ± SD
Single	4.45 ± 2.94	3.60 ± 2.34	2.45 ± 2.32	1.70 ± 1.94
Multi	4.55 ± 3.42	3.75 ± 2.75	3.00 ± 2.82	2.35 ± 2.56
t (p value)	0.099 (0.922)	0.185 (0.854)	0.671 (0.506)	0.90 (0.37)
ANOVA (P value)	0.01 -0.92	0.03 -0.85	0.45 -0.5	0.81 -0.37

Statistical analysis by independent t-test of the pain immediately after obturation and, after 6, after 12 and after 24 postoperatively in both single and multi-visits RCT showed no statistically significant differences at all study intervals: (*P*=0.92) between both the groups immediately after obturation, (*P*=0.85) after 6 h, (*P*=0.5) after 12 h and (*P*=0.37) after 24 h. (Table 6)

DISCUSSION

This study was conducted to compare post-obturation pain after single and multiple visit root canal treatment. One-visit therapy has several advantages over multiple visits. [(15)] Several studies compared postoperative pain after single and multiple visit root canal treatment but the results were contradictory. [(2,3,7,5,8-14)]

It should be noted that the results of our study (related to postoperative pain evaluation) were based mainly on the patients' own perception which is highly subjective and could be influenced by many factors. [(15)]

One of the problems faced by endodontists is that patients often experience postoperative pain, even after successful endodontic therapy, this may be due to difference in pain perception among people and the preoperative condition of the tooth. [(15)]

Fifty patients participated in this study, this sample size was close to that selected in a previous study done by to Farzanaet. Al 2011. [(8)] All selected patients were free of any systemic disease that might interfere with the results of our study. The age of all patients ranged between 20-45 years old. Pregnant females or patients taking antibiotics or corticosteroids were excluded.

Offending teeth that were tender to touch, with extensive intracanal calcifications or incompletely formed apices were also excluded as the condition of the teeth might interfere with the intensity of pain especially after single visit root canal treatment. [(5)]

Endodontic chart used in our study was designed to include all the informations

needed to be recorded about the offending teeth included in the study.

A modified visual analog scale (VAS) was chosen as it is a valid and reliable scale for evaluation of pain beside that it is easy to be understood by all age groups in agreement with previous studies. [(2,5,12,14)] Each patient was asked to mark on the scale that assigned a value between 0 to 10 to represent their intensity of pain.

The follow up period in our study was the first 24 hours after treatment as in a previous study done by Direnzo et al. [(5)]

Ten patients were eliminated from the analysis of the results as they did not submit the pain scale they were given.

In this investigation, overall incidence of post-operative (severe) pain in group I RCT was 85% immediately postoperatively, in contrast to 80% in group II. 6 hours postoperatively (90%) of the patients of both groups (n=18) experienced pain. After 12 hours (75%) of the patients of group I (n=15) and (60%) of the patients of group II (n=12) experienced pain. After 24 hours postoperatively (55%) of the patients of group I (n=11) experienced pain in contrast to (60%) in group II (n=12) The results indicated a higher frequency of pain following treatment completed in single visit as compared to that reported for those completed in multiple visits at all time intervals except the postoperative pain after 24 hours a decreased frequency of pain following treatment completed in single visit as compared to that reported for those completed in multiple visits There was no significant differences in postobturation pain between the two groups, and this comes in agreement with previous studies like Roane et al. 1983, DiRenzo et al. 2002, Sathorn et al. 2005,Ince et al. 2009, Wang et al. 2010, Singh et al. 2012, [(4,5,6,16,15)] Only Jabeen et al, 2014 concluded that the post-obturation pain in the single visit treatment group was more significant than in multi-visit treatment group. [(17)]

CONCLUSION

Under the limitations of this study it was concluded that Post-obturation pain is likely to occur in first 24 h, which further reduces as time passes. The intensity of post-obturation pain experienced following single- or multiple-visits RCT were not significantly different.

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