

The Effects of Bio Adhesive Chlorhexidine Gel, NSAIDs on Post-operative Sequelae after Periapical Surgery of Upper Anterior Teeth

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Abstract Although dropping need for apicoectomy as the modern endodontic therapy carry greatly promising outcomes but it is regularly done in dental clinics and may accompanied by some bothering points as ache, edema, so the main goal of this research is to evaluate the usefulness of dissimilar modalities in reducing edema and pain succeeding to the periapical surgery. Materials and Methods: This research done by involving twenty cases with periapical lesion need apicoectomy. Ten of them was given Chlorhexidine 0.2% (PerioKIN) gel to operative area and the other 10 patients given Diclofenac sodium (Voltarin) tablet 50mg, 3 periods a day for 7 days. Edema was assessed by a subjective clinical examination, ache using a visual analogue scale. Estimations done in the first 24 hours and on 72 hours and on 7 days. Results: No significant alterations were recognized for the edema but significant differences observed at seventh day after operation, pain values there was a highly significant difference at day three and day one and day seven there wasn't important differences between study groups after operation. Conclusions: Administration of PerioKIN in form of gel showed effects resemble to diclofenac tablets in dropping the edema and pain readings, Chlorhexidine could be used as an additional therapy in some medical conditions like heart diseases or with active pulmonary illnesses or gravid women or with stomach sore or inability of prescribing NSAIDs that is utilized empirically to diminish pain and edema consequent to periapical surgical procedures.

Keywords: Chlorhexidine gel, Diclofenac sodium, periapical surgery

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1. Introduction

Although dropping need for apicoectomy as the modern endodontic therapy carry greatly promising outcomes but still recommended in some sporadic cases. The periapical surgery, periradicular surgery, apicoectomy, apical surgery, endodontic surgery, parodontic surgery, are terms regarded to different operations done in the dental periapices to reestablish its practical state. In which comprises "removal of pathological conditions, amputation, reparation, and retro filling or curettage of the radicular apex". [1,2,3,4] also it could be used in some cases when the teeth with root canal therapy associated with periradicular lesions when the prognosis of other modalities are doubtful. [5,6] As a normal sequence to any surgical intervention a tributary consequence may occurs like ache (pain) and oedema, the amount depends on degree of tissue damage [7]. Alterations could happen in soft tissue through endogenously secreted biological mediators that are come out from the red and white blood corpuscles and injured tissue during inflammatory process like "histamine, serotonin, kinin and prostaglandin". [8,9]

Post-surgical swelling is a sequel of tissue trauma during surgical intervention and detachment of muscular tissues and arise as a result of direct injury to blood and lymphatic vessels. The extent of oedema depends on the quantity of soft tissue trauma. Oedema frequently highest level reach up to 12-48 hours' post-surgical intervention, but may completely resolve in 5-7 days. [9] Chlorhexidine CHX is a cationic biguanide with very little aquatic solubility, it is effective against vegetative microorganisms and mycobacteria and has moderate activity against fungus and viruses [10]. CHX is presently regarded as a typical oral antiseptic with fluoride, as proved by many researches as a protective agent in dental treatment [11]. Furthermore, its effective on "dental plaque and gingivitis, and in the inhibition and treatment of dental caries" [12,13]; also it can inhibits super add infections post oral surgery maintain health of the tissues around the implant. Also diminishes the microbial number in sprays of hand piece and turbine in addition to decreases bacteria in blood post dental intervention. CHX is particularly indicated in cases with orthodontic devices and disabled population, and immunologically threatened patients [14]. It also preserves its effectiveness in the attendance of blood, injuries and blisters [15]. Diclofenac is "known to possess

both painkilling and anti-inflammatory effects". Previous studies have proven that Diclofenac sodium reduces pain and swelling more, if not equally effective, when compared with other single anti-inflammatory drugs and/or fixed drug combinations after surgical work [16-20] It can therefore be used as an agent to control post-operative sequelae. Of its three dispensable forms, namely intravenous infusion, soft gel and tablets, per-oral tablets were favored because of the short half-life and coasty usage with infusions and gel [21,22]. The purposes of this study are observing the effects of topically applied perioKIN gel on post-surgical sequels like pain and edema which is used as a parameter in upper anterior teeth periapical surgery and make a comparison with oral Diclofenac and local measurers post operatively.

2. Materials and Methods

The research had been done at the "University of Mosul, dentistry college, Oral and MaxFax Department, with an ethic approval get with a special data sheet considered for this research was prepared, 20 healthy cases were haphazardly chosen with an age variation between 18-43 years of both sexes". Included patients who required surgical removal of periapical lesion and root apex resection of involved tooth under local anesthesia and judgement was constructed on clinical findings and periapical radiography. Criteria of involving cases includes: single upper anterior tooth affected by established periapical lesion and medically fit not allergic to penicillin with good oral hygiene with no clinical infective stage at operative work, rejection criteria: any medical disorder, sensitivity or hypersensitive reaction to the medicines involved in this research, or currently taking non-steroidal anti-inflammatory drugs Expectant or lactating ladies, and patients refusal or cannot attend or take other medications. The surgical works had been accomplished by one operator, all the apicoectomies done under local anesthesia infiltration. The operation was performed by making a three sided flaps. The flap was watered with normal saline. Following operation, closing of the flap was completed. Cases were distributed to; group 1 included ten cases; the flap would be closed by sling suture and simple interrupted suture and given oral

Diclofenac sodium tablets and group 2 ten patients the interior flap pasted by Chlorhexidine 0.2% (perioKIN) gel and closed by sling and simple interrupted suture and patient had been given perioKIN) gel two gm and container size two ml to be applied three times daily on operation site for 7 days, on accomplishment of surgical work entirely the cases were prescribed antibiotic "Amoxicillin 500mg cap. three times a day for 3 days for control group and study group, and Diclofenac sodium 50mg tablets three times a

day for three days for control group only, both groups will be observed in respect to healing by evaluation of post-operative ache subjectively using the visual analogue scale, which is consists of a ten cm representing pain severity. The involved case grades on the line the tentative degree of ache strength and recorded". [23] Extent of edema was also instinctively evaluated by clinical examination according to criteria below:

Grade zero= No swelling.

Grade one= intraorally localized to the surgical field obvious swelling.

Grade two= intraorally beyond the surgical field.

Grade three= extraorally visible swelling (nasolabial fold not obliterated).

Grade four= massive swelling. [24]

Then the readings taken of the pain and edema parameters documented for 1st day, 3^{ed} day and 7th day after surgical intervention. Analysis of the readings statistically was computed by means of "SPSS soft wear program version 22 windose 2013. A significant difference was measured at p value ≤ 0.0001 ".

3. Results

The Analysis between two treatment groups, usage of chlorhexidine (PerioKIN) gel and Voltarin tablets group shows no statistical differences correlated to the two parameters pain and edema at day one and day three and day seven as investigated by "independent T test" as presented in Table 1 by rank of means, also there was no statistical difference in pain day one (0.062) and day 3 (0.018) means significant result and day 7 (1) and also for swelling at day 1,3,7 (1, 0.45, 0.001) respectively as shown in Table 2 means significant at day 7.

Table 1. Descriptive statistics of tested parameters in the chlorhexidine and diclofenac sodium groups

Parameter and time	treatment	Mean	Standard Deviation	Standard Error Mean
Pain Day1	Chlorhexidine PerioKIN®	3.3	0.48305	0.15275
	Diclofenac sodium 50mg	3.9	0.8756	0.27689
Pain Day3	Chlorhexidine PerioKIN®	1.8	0.91894	0.29059
	Diclofenac sodium 50mg	1.5	0.52705	0.16667
Pain Day7	Chlorhexidine PerioKIN®	0.4	0.5164	0.1633
	Diclofenac sodium 50mg	0.6	0.5164	0.1633
Swelling Day1	Chlorhexidine PerioKIN®	1.6	0.5164	0.1633
	Diclofenac sodium 50mg	1.8	0.63246	0.2
Swelling Day3	Chlorhexidine PerioKIN®	1.2	0.42164	0.13333
	Diclofenac sodium 50mg	1	0.4714	0.14907
Swelling Day7	Chlorhexidine PerioKIN®	0	0	0
	Diclofenac sodium 50mg	0.2	0.42164	0.13333

Table 2. Pain and edema parameters related to chlorhexidine and Voltarin groups

		P-value	Significant (2-tailed)
Pain DAY 1	PerioKIN®	0.062	0.074
	Voltarin		0.079
Pain DAY 3	PerioKIN®	0.018*	0.382
	Voltarin		0.385
Pain DAY 7	PerioKIN®	1	0.398
	Voltarin		0.398
Swelling DAY 1	PerioKIN®	1	0.449
	Voltarin		0.449
Swelling DAY 3	PerioKIN®	0.45	0.331
	Voltarin		0.331
Swelling DAY 7	PerioKIN®	0.001*	0.151
	Voltarin		0.168

* P value significant at ≤ 0.05 .

Demographical analysis showed mean age 30.5 years with equal preponderates of male and female patients.

4. Discussion

A clinical study done by comparing "CHX with no treatment, placebo, another formulation of CHX in patients undergoing oral surgery without antibiotics, the results were not statistically different so it regarded to has a good property post-surgical work" [25,26], CHX as a gel can eliminate postsurgical pain in cases with or without alveolar osteitis. CHX can be used during all phases of endodontic therapy, including disinfection of the operative area, because of its ability to kill harmful microorganisms and substantively possessions. It may be a second option for to sodium hypochlorite (NaOCl), due to its biological compatibility, or in hypersensitivity interrelated to decolorizing agents [27,28,29] using CHX showed slightly significant differences in pain parameter in day 3 probably due to subsidence of inflammatory mediators and the frank and prolonged effect of antibiotic activity of CHX but the significant difference related to oedema that was observed at day 7 may be due to early effect of CHX on oedema in comparison with NSAIDs also may be due to decreasing the inflammatory mediators locally. Results of the presented research showed that CHX had an anti-bacterial properties post periapical surgery, also pain parameters showed significant reduction that prove using perioKIN gel could be used as an additional therapy in some medical conditions like cardiac diseases or with active pulmonary disorder or gravid women or with stomach sore or inability of prescribing NSAIDs that is used empirically to diminish pain and edema consequent to periapical surgical procedures which is familiarized to diminish pain and swelling, and effects on swelling post operatively had less clinical effects.

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