

Impact of low dose dexamethasone in third molar surgery outcomes

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Abstract

Third molar surgeries are one of the most common oral surgical practices happening on daily basis. With evolution, the incidence of impacted third molars seems to have increased and requires frequent intervention. More frequently complains include pain, swelling and difficulty in opening of mouth in initial postoperative period. Such incidences discourage patients to seek opinion/treatment on follow up basis or even in terms of referral. Addition of low dose dexamethasone after third molar surgery as a part of treatment regime have shown better outcomes in initial postoperative period. The study compares the postoperative out comes in 2 different groups of patients.

Keywords: Dexamethasone, Third Molars, Trismus

Introduction

Surgery of lower impacted third molar can be quite traumatic to the patient especially during the postoperative phase regardless of the efficient or inefficient intraoperative phase. The lower impacted molars lies in an area which quite vascularized and invasive procedure in that area warrants an inflammatory sequelae which leads to pain, swelling and general oral dysfunction¹.

Trismus is one sign of pterygomandibular space infection, an area which is closely associated to the third molar which is characterized by presence of major vessels and loose areolar connective tissue².

It has been for long though that proper surgical technique including gentle manipulation of associated soft tissues and analgesic administration can lead to more tolerable

postoperative sequelae though pain sometimes is not controlled completely in most of the cases³.

Glucocorticoids have the ability to alter or affect most of the processes entailing inflammation. They are known to reduce the circulating lymphocytes, inhibit capillary dilatation and fibroblast proliferation. Further down they have the ability to alter prostaglandin and leukotriene synthesis which are directly mediating the inflammatory effects and hence clinically have been found to reduce the acute inflammatory conditions that occur post operatively⁴. Dexamethasone has been potent anti-inflammatory drug, with long half-life and is considered safe for shorter period of time even when the dosage is above physiological limit⁵.

Mandibular impacted molars are quite common to walk in oral surgical set up. The methods of retrieving these impacted teeth has evolved from chisel mallet to collar bone guttering using rotatory burs on low speed headpiece. Nowadays peizosurgery has found its application in third molar surgeries and have claimed to have better post-operative results as compared to conventional bone cutting/guttering method. However, change in armamentarium does not necessarily warrant a predictable outcome in terms of post-operative sequelae. A little pharmacological aid can help in long run to create awareness amongst patients and improve the acceptability of this relatively regular procedure.

Material and methods

20 patients were taken up with impacted third molars for the study with age ranging from 22-38 years that walked in between January 2021 to March 2021. Patients were followed up for 2 weeks after the surgery. Parameters like facial swelling, post-operative pain, wound healing, and mouth opening. The patients were followed up at immediate post op, 7 days and 14 days respectively.

After giving 2% lignocaine with 1:200,000 vasoconstrictor, Standard third molar surgery was performed which involved raising the flap, guttering of the bone around the tooth using rotatory burs on low speed hand piece with copious irrigation. According to the classification the tooth were either dived and then elevated or elevated immediately after bone removal. The socket was toiled with saline and silk sutures were given to achieve primary closure. 4 mg dexamethasone was injected into the surgical site submucosally, while the other group received plain saline in the same corresponding site. Time taken for each surgery was recorded from incision to final closure.

The patients were recalled after 1 week of surgery, when the suture removal was carried out followed by betadine irrigation. Mouth opening was quantified by interincisal opening. The pain was measured on visual analogue scale. Swelling was measured quantitatively by using silk suture to measure from the zygomatic arch to the inferior border of the mandible to measure the superoinferior dimension of the swelling, while suture was placed from the corner of the mouth to the posterior border of the mandible to measure the anteroposterior projection of the swelling.

The collected data was subjected to statistical analysis.

Results

Out of 20 patients reported, 8 were females and 12 males, according to Winters classification 9 were vertical impactions 3 distoangular, 4 horizontal impactions and 4 mesioangular impactions. According to Pell and Gregory, 14 were class 1 out of which 9 were position A, while 3 were position B and 2 were position C, 5 Class 2 out of which 3 were position A and 2 were position B, 1 Class 3 position B.

Youngest patient was that of 22 years and oldest patient treated was 38 years old.

Mean time taken for the surgery was 35.42 ± 2.16 mins in group A while time taken in group B was 33.78 ± 3.06 mins.

The visual analogue scale pain assessment was 6.54 ± 0.98 in first week of follow up while in 2nd week of follow up it was recorded as 3 ± 1.02 in group A while in group B it was found to be 7.1 ± 0.44 and 2.8 ± 1.67 respectively. The difference in the recording was found to be statistically significant when compared within the same group at 7th day and 14th day follow up.

30% patients from group A reported with wound dehiscence while there were no instances of the same in group B.

Mouth opening measured in group A in first week of follow up was 29 ± 2.1 mm while for second week it was 30 ± 0.9 mm. in case of group B the recordings were 27 ± 1.98 mm and 29 ± 0.87 mm respectively.

Swelling reported from group A superoinferior was 5.5 ± 1.6 mm while anteroposterior was 8.3 ± 1.6 mm while in group B 6.3 ± 2.40 mm and 9.5 ± 1.5 mm at the first week. Second week recording was 5.1 ± 2.1 mm and 7.9 ± 0.98 mm respectively while in group B 5.9 ± 2.67 mm and 8.9 ± 1.3 mm respectively.

All values recorded though differ in numeric representation in terms of improvement however were not found to be statistically significant.

Discussion

The said study was conducted as a pilot to a larger study which hopefully can deliver more concrete evidence than gathered from this study. While parameters do not have a statistical significance, subjective outcomes suggest that administering dexamethasone submucosally in the third molar surgical site do improve patient's experience. The drug was given submucosally to limit the absorption to systemic circulation which would have been true in case

of pterygomandibular space injection just like that of local anesthesia.

The longer operating time is typically associated with more pain, and the difficulty in operation may increase the pain^{1,6}. In our case though the operating time did not differ when compared between the groups, but however, the patient(s) in which time taken was comparatively longer (42 mins and 39 mins) did report with increased pain and swelling as compared to other patients.

The post-operative pain also seems to be dependent on soft tissue manipulation and the extent of hard tissue removal. The cleaner and swifter the surgery the better outcome was seen in the patient. In this study young patients with vertical impaction with partial soft tissue covering which was otherwise not inflamed and took less time (12 mins) seemed to have fared better in parameter assessment as compared to horizontal impaction which was class 3 position B which took 42 mins to complete but also did not have inflamed mucosa.

Wound dehiscence was reported in patients who were not given dexamethasone though were the patients who had inflamed over lying or surrounding mucosa. the dehiscence can be accounted to faulty suturing technique or simply because at the time of procedure the suture bite was taken on an otherwise friable tissue which did not hold later. Accumulation of exudates and causing local rise in pressure leading to tension on the sutured margins can also be accounted for the dehiscence. Dexamethasone since works by decreasing the amount of exudates^{4,5} hence can be accounted for no dehiscence in the other group. It is recommended that a larger trial is warranted to ascertain this assumption.

The role corticosteroid in pain management is controversial but the purpose of their administration is to reduce the accumulation of inflammatory mediators and reduce fluid transitions and edema which are often

mistaken by the patient when reporting in follow up. Swelling parameters in group A which received dexamethasone 4 mg submucosally shows better recovery from swellings than the patients in group B though the findings seem statistically insignificant.

Trismus usually occurs because of muscular spasm after prolonged opening, or even because of faulty injection technique⁷. Accumulation of transudates around in the muscular space limits the activity of the muscles and leading to limitation in movement¹. Patients who were compliant about post operative instructions pertaining to the mouth opening or early initiation of function seemed to be less affected by limited mouth opening in our study. However in case of faulty injection technique, trying to initiate function appeared debilitating to the patient and their mouth opening was found restricted by the end of follow up period. This patient was further advised mouth opening exercises and was doing well after revised instructions.

As mentioned earlier a larger trial is under way to put the following findings in a different perspective and better elucidation. However, initial findings do encourage the use of low doses dexamethasone in third molar surgeries.

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