Benefits of not Prescribing Prophylactic Antibiotics After Third Molar Surgery

Anchal Prajapati^{1,2} · Aalap Prajapati¹ · Swati Sathaye¹

Received: 7 February 2015 / Accepted: 29 May 2015 / Published online: 5 July 2015
© The Association of Oral and Maxillofacial Surgeons of India 2015

Abstract

Aim and Objective The aim of the study is to reinstate the fact that antibiotics are not required as prophylaxis for third molar surgery. So the standard of care after extraction of mandibular third molar surgery for all healthy patients should be a good anti-inflammatory regimen rather than a antibiotic prophylaxis.

Context Surgical removal of impacted mandibular third molar is the most common procedure and many complications are usually encountered in this procedure like—pain, trismus, infection, swelling, inflammation and nerve damage. Now, the question that arises is does the age old practice of prescribing postoperative antibiotics solve these problems or adds on some new. The data collected and analysed in our observational study, however, reinstates that instead, it is the proper aseptic precautions and good anti-inflammatory regimen that are more important than the prophylactic antibiotics (Pasupathy and Alexander in J Craniofac Surg, 2011). Moreover, giving antibiotics means opening up the loopholes to bacterial resistance.

Settings and Design A retrospective analysis of the data collected from 40 patients coming to the department of Dental and Implant Surgery, Karamsad, Anand between October 2014 and December 2014, operated for third molar surgery was carried out.

Materials and Methods Data from 40 patients requiring disimpaction of mandibular third molar was analysed.

Postoperatively, only anti-inflammatory medication was prescribed to all the patients.

Results None of the patients showed any of the signs or symptoms of infection.

Keywords Impacted mandibular third molar · Postoperative prophylactic antibiotic · Surgical site infection

Introduction

The surgical removal of impacted third molar is one of the most common procedures performed in dental clinics [2]. Antibiotics were used as an age old practise to reduce the complications associated with the same. Unfortunately, the use of antibiotics without appropriate indications (immunocompromised patients, uncontrolled diabetes mellitus, risk of bacteremias and endocarditis) can result in development of many of resistant organisms, secondary infections, damage to intestinal membranes, toxicity and allergic reactions.

Literature supports ample data which states that antibiotic prophylaxis after third molar surgery is of no much help to healthy patients. But alas, till date there still have been many randomised controlled trials done across the globe to reinstate the fact that use of postoperative antibiotics after third molar surgeries is unnecessary. Then, why not apply it as our standard of care and put an end to the futile randomised controlled trials in this subject which is putting at least one group at risk of side-effects of antibiotics?

We in our Department of Dental and Implant Surgery, Karamsad put in our routine practise of not giving postoperative antibiotics after mandibular third molar surgery

✉ Anchal Prajapati
anchal2002359@gmail.com

¹ Department of Dental and Implant Surgery, Pramukh Swami Medical College and Hospital, Karamsad, Gujarat, India

² 12/C Shivam Society Channi Jakat Naka, Vadodara, Gujarat, India

and have collected data retrospectively for this study. Our study shows that there were no complications to patients after third molar surgery by our routine standard of care (not giving any antibiotics postoperatively after mandibular third molar surgery).

Materials and Methods

The study included collecting data retrospectively from 40 patients coming to the department of Dental and Implant Surgery for extraction of their third molar. The study has received approval from Human Research Ethical Committee of Pramukh Swami Medical College, Karamsad.

The data was collected between October 2014 and December 2014.

Inclusion Criteria were (1) Patients above 18 years of age, (2) Patients with partially bony impacted mandibular third molar with or without pericoronitis or caries, (3) Patients not receiving any antimicrobials for at least 6 weeks prior to the procedure.

The Exclusion Criteria were (1) Immunocompromised patients or those with any systemically compromised diseases, (2) Patients having local pathology such as a cyst or tumor associated with impacted tooth, (3) Patients with irradiated maxillofacial region, (4) Patients who have received antibiotics for recent systemic infection about 6 weeks ago, (5) Mentally challenged patients and patients unable to come for follow up visits, (6) Patients in whom the surgical phase extended for more than 2 h.

Methodology

Data from 40 patients were included according to the above inclusion and exclusion criterias. The mean (SD) age of patients was 31.80 (6.20) (range 23–40 years). Presurgical evaluation of pain, facial measurement and mouth-opening were made. Aseptic precautions were made available for all the patients (painting the patient with betadine and drapping the patient, autoclaved instruments, using sterile gloves and masks and use of No touch technique of sterilization). All the patients were given the following set of instructions: (1) Apply ice pack for the first 48 h after surgery—10 min per every 2 h in the first 24 h, and then twice a day for the next 24 h, (2) Avoid sleeping on the operated side, (3) Take cold soft, liquid/semi solid diet, (4) Take the prescribed analgesics (50 mg of tab diclofenac bid for 2 days).

Evaluation of Pain was by VAS method: Visual Analogue Scale [3, 4].

A: Score 0—No pain. B: Score 1—Slight pain; If patient is distracted he/she does not feel pain. C: Score 2—Mild pain; The patient feels pain even if concentrating on some activity. D: Score 3—Severe pain; The patient is very

disturbed but nevertheless can continue with the normal activities. E: Score 4—Very severe pain; The patient is forced to abandon normal activities. F: Score 5—Extremely severe pain; The patient must abandon every type of activity and feel the need to lie down.

Evaluation of Facial Measurement Swelling was measured using a horizontal and a vertical guide with a measuring ruler. The horizontal distance being the distance between the oral commissure and the lowest part of ear lobe and the vertical distance between the external canthus of the eye and angle of mandible. The average of the two determined the facial measurement. Swelling not commensurating with the inflicted surgical injury and/or not diminishing between 3rd and 4th day post-operatively was considered infective in nature.

Assessment Of Mouth Opening Greater than 2 fingers mouth opening is expected on 3rd day of surgery. But reduced mouth opening <2 fingers is not always a sign of infection if it is not accompanied by fever, pus discharge and increasing swelling.

Procedure

All patients selected by the above method were posted for the surgical procedure. All the procedures were performed under local anesthesia by the same technique. Complete aseptic precautions were used and the instruments used were autoclaved. Constant copious irrigation with saline was used during ostectomy and odontomy using micromotor with straight handpiece. Sectioning of the tooth was done when indicated. Primary closure was accomplished with 3–0 Mer-silk (Ethicon by Johnson and Johnson Ltd) sutures. All patients were given the same set of postoperative instructions.

Results

No severe complication like persistent pain and swelling, fever, lymphadenopathy and purulent discharge were seen in any of the patients. The results calculated were on the basis of paired t test. The *p* value was <0.001 in all the three measurements which have been taken, so the result is significant. There was significant decrease in pain, significant improvement in facial measurement and increase in mouth opening from 3rd to 7th day after surgical procedure (Table 1).

Discussion

We conducted this study in view of the growing concerns about the over-prescription and misuse of antibiotics, considering the implications regarding adverse effects in

Table 1 Paired samples statistics

	Mean	N	Std. (SD) deviation	Std. error mean
Pair 1				
VAS (post op day 3)	1.75	40	.670	.106
VAS (post op day 7)	.83	40	.747	.118
Pair 2				
Facial assessment (post op day 3)	105.40	40	4.623	.731
Facial assessment (post op day7)	102.63	40	3.279	.518
Pair 3				
Mouth opening (post op day 3)	31.28	40	2.660	.421
Mouth opening (post op day 7)	40.08	40	2.246	.355

The VAS Score postoperative day 3 to postoperative day 7 has decreased significantly. The mean (SD) has decreased from 1.75 (.67) to .83 (.75)

The facial measurement postoperatively from day 3 to day 7 has decreased significantly from mean (SD) 105.40 (4.62) to 102.63 (3.20)

The mouth opening for the patient has increased significantly from mean (SD) 31.28 (2.66) at 3rd day postoperative to 40.08 (2.25) at 7th day postoperatively

Statistical analysis showed significant decrease in pain and facial measurement and increase in mouth-opening i.e. $p < 0.001$ in all the cases

individual patients and increasing antimicrobial resistance within the community. This becomes very true when patients get exposed to life threatening infections and antibiotics fail to play their expected role. Also, significant financial implications should be considered when considering the high price spent on unjustified prescription of antibiotics, and the need for more expensive antibiotics when serious infections happen [5].

Poeschl et al. [6] suggested that specific postoperative oral prophylactic antibiotic treatment after the removal of lower third molars does not contribute to a better wound healing, less pain, or increased mouth opening and could not prevent the cases of inflammatory problems after surgery, and therefore is not recommended for routine use. Siddiqui et al. [7] questioned the value of prophylactic antibiotics in third molar surgery. Curran et al. [3] in a double-blind study, concluded that the use of prophylactic antibiotics in third molar surgery was unnecessary unless specific systemic factors were present. Arteagoitia et al. [8] concluded that postoperative treatment with amoxicillin/clavulanic acid could reduce inflammatory complications after third molar surgery, but should not be prescribed in all cases. MacGregor et al. [9] did not recommend the use of prophylactic antibiotics for third molar surgery except in very difficult cases. The estimated rate of infection after removal of third molar is $<1\%$, so the usage of such drugs is questionable [3]. Ren [10] reviewed 12 published clinical trials on 2396 patients for effectiveness of antibiotic prophylaxis and 1286 subjects received placebo. Post-operative complications occurred in 4% of antibiotic group and 6.1% of those on placebo.

So, there is a plethora of studies that disapprove the use of antibiotics in the removal of third molar surgery [11] as,

there appears to be very little clinical gain by the administration of a postoperative oral antibiotic and therefore it cannot be recommended.

Conclusion

Lower third molar removal is a common surgical procedure performed in dentistry that often results in pain, swelling, trismus, bleeding, nerve dysfunction, and postoperative infection. In addition, antibiotic therapy after impacted lower third molar removal is common and, until recently, universally accepted. Some evidence exists supporting routine prophylactic use of antibiotics to reduce postoperative complications after third molar surgery [12], yet several studies have revealed an insignificant gain in a patient's postoperative condition after using antibiotics [2, 7, 11, 13]. In this context, in an effort to reduce the development of drug-resistant and cross-resistant bacteria, clinicians must carefully consider the prophylactic use of antibiotics for invasive procedures. That is, antimicrobials should be administered only to treat bacterial infections or prevent bacterial infections in patients who are either immunocompromised or have a significant risk of postoperative infection.

The current evidence questions the benefits of routine prophylactic antibiotic therapy which does not appear to overcome the risk of undesirable outcomes after third molar removal. In our opinion there is no justification for routine antibiotic prophylaxis for third molar surgery, as it is the inflammatory component that plays a role after surgical extraction which can easily be controlled by a good

anti-inflammatory regimen rather than prophylactic antibiotic.

Ethical standard The study which has been proposed as the paper above has been approved under the name of proposal: “Outcome of not using postoperative antibiotics after mandibular third molar surgery: a retrospective analysis of patients of department of dental and implant surgery, Karamsad” and has been approved by Human Research Ethical Committee of Charutar arogya mandal, Karamsad, Gujarat. This committee has been registered as the Institutional Ethics Committee, HM Patel Centre for Medical Care and Education situated at Gokul nagar, Karamsad -388325, Gujarat, India with registration No. ECR/331/Inst/GJ/2013 as per provisions of rule 122DD of the Drugs and Cosmetics Rules, 1945.

References

1. Pasupathy S, Alexander M (2011) Antibiotic prophylaxis in third molar surgery. *J Craniofac Surg* 22(2):551–553
2. Kaczmarzyk T (2009) Abuse of antibiotic prophylaxis in third molar surgeries. *J Oral Maxillofac Surg* 67(11):2551–2552
3. Curran JB, Kenneth S, Young AR (1974) An assessment of the use of prophylactic antibiotics in third molar surgery. *Int J Oral Surg* 3:1–6
4. Berge TI (1988) Visual analogue scale of postoperative pain and swelling. *Acta Odontol Scand* 46:233–240
5. Olusanya AA, Arotiba JT, Fasola OA, Akadiri AO (2011) Prophylaxis versus pre-emptive antibiotics in third molar surgery: a randomised control study. *Niger Postgrad Med J* 18(2):105–110
6. Poeschl PW, Eckel D, Poeschl E (2004) Postoperative prophylactic antibiotic treatment in third molar surgery—a necessity? *J Oral Maxillofac Surg* 62(1):3–8
7. Siddiqi A, Morkel JA, Zafar S (2010) Antibiotic prophylaxis in third molar surgery: a randomized double-blind placebo-controlled clinical trial using split-mouth technique. *Int J Oral Maxillofac Surg* 39(2):107–114
8. Arteagoitia I, Diez A, Barbier L, Santamaría G, and Santamaría J (2005) Efficacy of amoxicillin/clavulanic acid in preventing infectious and inflammatory complications following impacted mandibular third molar extraction. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 100(1):e11–8
9. MacGregor AJ (1990) Reduction in morbidity in surgery of third molar removal. *Dent update* 17:411
10. Ren Y-F, Hans S (2007) Effectiveness of antibiotic prophylaxis in third molar surgery: a meta-analysis of randomized controlled clinical trials. *J Oral Maxillofac Surg* 65(10):1909–1921
11. Rohit S, Reddy P (2014) Efficacy of postoperative prophylactic antibiotic therapy in third molar surgery. *J Clin Diagn Res JCDR* 8(5):ZC14–ZC16
12. Oomens MAE, Forouzanfar T (2012) Antibiotic prophylaxis in third molar surgery: a review. *Oral Surg Oral Med Oral Pathol Oral Radiol* 114(6):e5–12
13. Adde CA, Soares MS, Romano MM (2012) Clinical and surgical evaluation of the indication of postoperative antibiotic prescription in third molar surgery. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 114(5):S26–31.30