Effect of Low-Concentration Povidone Iodine on Postoperative Complications After Third Molar Surgery: A Pilot Split-Mouth Study

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Purpose: Povidone iodine is used primarily as an antiseptic to decrease surgical site infection. Its hemostatic and antiedematous properties in oral surgery also have been investigated recently.

Patients and Methods: A randomized controlled clinical trial was performed in 30 patients undergoing mandibular third molar removal in a split-mouth design. In the study group, a povidone iodine solution with a concentration of 0.5 mg/mL was used as the coolant and irrigant solution, whereas normal saline was used in the control group. Swelling (orotragus and mentotragus distances), trismus (maximum interincisal opening), and pain (visual analog scale score) were evaluated on postoperative days 2 and 7.

Results: In the study group, a significant decrease in swelling and trismus was observed at the 2 postoperative visits ($P = .00$) compared with the control group. The decrease of pain in the study group was not statistically significant at either postoperative visit ($P > .05$). More patients (63%) were subjectively satisfied with the side treated with povidone iodine.

Conclusion: Povidone iodine irrigation is an inexpensive and safe method to lessen the postoperative sequelae of third molar surgery.

J Oral Maxillofac Surg 73:18-21, 2015

Surgical removal of impacted teeth is one of the most common operations performed by oral and maxillofacial surgeons. Postoperative sequelae such as pain and swelling are common and bothersome to patients; therefore, surgeons have sought different techniques to decrease these sequelae. Inflammation is the major cause of these complications; thus, different agents have been tested for their anti-inflammatory properties. Polyvinylpyrrolidone iodine (PVP-I; povidone iodine) is a highly potent antiseptic solution known for its bactericidal activity against a wide spectrum of pathogens.[1] In more recent studies, its hemostatic[2] and antiedematous[3] properties have been investigated, with successful results. With this in mind, the

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Received December 27 2013

Accepted June 30 2014

0278-2391/14/01113-6

http://dx.doi.org/10.1016/j.joms.2014.06.454

authors performed a prospective randomized split-mouth study of patients undergoing surgical removal of impacted mandibular third molars to evaluate whether diluted povidone iodine used as an irrigant and coolant has any effect on common postoperative sequelae, including swelling, pain, and trismus.

Patients and Methods

A prospective, randomized, clinical, split-mouth trial was designed to eliminate biasing factors such as interpersonal differences in response to surgical trauma. Thirty patients were selected from those referred to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Tehran University of Medical Sciences (Tehran, Iran) for surgical removal of their impacted mandibular third molars from March 2012 to September 2012. The study design was approved by the ethics committee of the Tehran University of Medical Sciences and informed consent was obtained from all participants. The sample size was determined based on a pilot study consisting of 5 cases.

To promote uniformity in patient enrollment, healthy patients (18 to 25 yr old) with bilateral impacted mandibular third molars with similar position and degree of impaction (according to panoramic radiograph) were recruited. Exclusion criteria were presence of systemic disease, use of antibiotic or anti-inflammatory medications within 2 weeks before surgery, presence of any pathologic or inflammatory condition in the area of the impacted teeth, and a history of iodine hypersensitivity.

One impacted mandibular third molar in the first patient was randomly allocated to the study side by using a coin (coin randomization) and the other side served as the control. In the next patient, the opposite sides were allocated to the study and control groups, respectively. Likewise, the right side in 15 patients and the left side in the other 15 patients served as the control. The first author performed all the surgeries using the exact same technique. The teeth were removed under local anesthesia with 2% lidocaine and 1:80,000 epinephrine. To gain access to the impacted teeth, full-thickness mucoperiosteal triangular flaps were elevated. Ten percent povidone iodine 1 mL was diluted in normal saline 20 mL to obtain a 0.5% concentration of povidone iodine. Ten milliliters of this solution was diluted in normal saline 1,000 mL to obtain the povidone iodine concentration of 0.5 mg/mL. This solution was used as a coolant and irrigant during bone removal and tooth sectioning with burs in the study side, whereas sodium chloride 0.9% was used in the control side. After the removal of each tooth, the sockets were irrigated with equal amounts of irrigant. Wound closure was achieved using 4 3-0 black braided silk sutures. All surgeries were performed in less than 30 minutes. Because it was possible for the irrigant solution to reach the opposite side, the surgeries were performed at different sessions at a 3-week interval.

Postoperatively, amoxicillin 500 mg every 8 hours for 24 hours and ibuprofen 400 mg every 6 hours for 48 hours were prescribed for all patients. All patients used the prescribed medications as ordered. No steroid was administrated to any patient. Patients were instructed to rinse their mouth twice daily with 0.2% chlorhexidine mouthwash. To assess the swelling, before surgery and on postoperative days 2 and 7, orotragus and mentotragus distances (the distance from the most inferior part of the tragus to the oral commissure and to the soft tissue menton, respectively) on the operated side were measured. To evaluate the degree of trismus, the distance between the incisal edge of the maxillary and mandibular central incisors was measured during unassisted maximum opening of the mouth preoperatively and on postoperative days 2 and 7. All measurements were performed by another surgeon who was blinded to this study and were repeated 3 times and the average value was recorded. For assessing postoperative pain, patients were provided a visual analog scale (VAS) with scores from 0 to 10 and were asked to record the amount of pain experienced postoperative days 2 and 7. A score of 0 indicated no pain, whereas a score of 10 indicated extremely severe pain. Moreover, subjective patient satisfaction measurements were obtained and recorded (patients were asked to declare which side was more comfortable). Statistical analysis was carried out using the *t* test, Wilcoxon signed-rank test, and the McNemar test using SPSS 16 for Windows (SPSS, Inc, Chicago, IL).

Results

Thirty candidates requiring surgical removal of bilateral bony impacted mandibular third molars were selected for this study (Table 1). The patients' mean age was 22 years, and 17 patients were women (56.6%) and 13 were men (43.3%). Most removed teeth exhibited mesioangular impaction (76.7%), whereas distoangular impaction was the least frequent (3.3%; Fig 1).

Table 1. PATIENTS STUDIED (N = 30)

Variable	Patients, n (%)
Gender	
Male	13 (43.3)
Female	17 (56.7)
Age (yr)	
Mean	22
Range	18-26

Mahmoud Hashemi et al. Povidone Iodine and Third Molar Surgery. J Oral Maxillofac Surg 2015.