

## Adjuvant Pain Control Using Parental Intramuscular Ketorolac in Office Rhinology Procedures

Gary J. Nishioka, MD, DMD, FARS, FAAOA\*

Willamette Ear Nose and Throat and Facial Plastic Surgery, Salem, Oregon, USA



### Abstract

Balloon sinuplasty (BSP), also known as balloon sinus dilation (BSD), has seen a significant percentage of cases that would generally be performed in the operating room transition to the office setting. This has resulted in a dramatic increase in the number of rhinology procedures performed in the office setting creating a new category commonly referred to as office rhinology. As surgeon experience and comfort has grown with office rhinology procedures, performing more extensive and complex procedures with ethmoidectomies, middle and inferior turbinate reduction, and septoplasty combined with BSD procedures is emerging. While patient selection is paramount for determining who should or should not undergo office rhinology procedures, effective pain and anxiety control is essential. There are many topical and infiltrative local anesthesia regimens with or without sedation available to the surgeon, but one adjuvant pain control measure which has not been examined or discussed for office rhinology is the use of intramuscular (IM) ketorolac. Ketorolac is a non-opioid analgesic medication and when given intramuscularly has the same efficacy as morphine and meperidine. It has been used effectively in the emergency department setting. This communication examines anecdotal experience with IM ketorolac in patients who underwent more extensive and complex office rhinology procedures and patients with significant anxious concerns about pain control who still desire their procedures be performed in the office setting. A small group of office rhinology patients with these features were casually examined who received IM ketorolac. Using historical controls of similar patients as a reference, a clear impression is left that IM ketorolac has the potential of providing significant additional pain control and comfort. While further investigation is merited to determine true efficacy the surgeon can implement IM ketorolac as an adjuvant pain control measure with their current anesthesia regimen as an option now.

While office-based otolaryngology procedures have been performed in the office setting for many years [1], the transition of balloon sinuplasty (BSP) procedures, also known as balloon sinus dilation (BSD), from the operating room to the office setting has dramatically increased rhinology office-based procedures [2] creating an unofficial subcategory of rhinology referred to as "office rhinology". Performing office-based procedures that previously were performed in the operating room requires proper patient selection, and the most effective pain and anxiety control measures possible within the comfort zone of the surgeon. A wide variety of topical and infiltrative local anesthesia techniques with or without oral sedation have been employed, and the choice appears to be largely based on the surgeon's comfort level [2].

Ketorolac is a pyrrolo-pyrrole nonsteroidal anti-inflammatory drug (NSAID) with a potent analgesic effect when administered intramuscularly for the treatment of acute pain [3]. Maximum plasma concentrations are achieved in 45-50 minutes with peak analgesic effects in 1 to 2 hours following intramuscular injection. The analgesic effect is similar or superior to that of morphine, meperidine, or pentazocine in single-dose studies with postoperative pain [3]. Adverse effects are mild to moderate and self-limited. Ketorolac's effectiveness has been demonstrated clinically in the emergency department setting [4], and because it is a non-opioid medication, it does not have sedative properties which can be concerning in this setting. Furthermore, it avoids the current social and health issues with opioid medication use. Of important note, ketorolac is contraindicated in patients with aspirin exacerbated respiratory disease (AERD) [5,6] and given the higher prevalence of AERD in rhinology patients increased awareness is warranted. Utilization of parenteral ketorolac by any route (intramuscular or intravenous) has not been described in the literature for office otolaryngology and rhinology procedures.

A chart review over a 1-year interval from June 2017 to June 2018 found 8 patients who received intramuscular (IM) ketorolac. While no specific criteria were used to select patients, IM ketorolac was offered and discussed (including informed consent) at the time of the preopera-

tive visit for patients in whom could have significant pain such as hybrid BSD procedures in which ethmoidectomies, septoplasty and turbinate reduction procedures are combined with BSD procedures. IM ketorolac was also offered to patients who had significant concerns and/or anxiety about pain associated with the planned procedures but still wanted to their procedures performed in the office setting versus ambulatory surgery center with general anesthesia. The exclusion criteria for intramuscular ketorolac included aspirin sensitivity such as aspirin exacerbated respiratory disease (AERD), and any prior adverse reaction of any kind to a nonsteroidal anti-inflammatory medication.

On the day of office surgery, ketorolac was given intramuscularly prior to beginning the topical and local anesthesia regimen to allow the medication to achieve a significant analgesic effect for the planned rhinology procedures. The patient preparation regimen used for office rhinology procedures in this communication has been previously described in detail [2]. All 8 patients received 60 mg of ketorolac which was placed intramuscularly with injection into the gluteus maximus muscle using a lateral hip approach. An alternative route would be administration into the vastus lateralis muscle using a lateral thigh approach. Dosing instructions for IM injection of ketorolac are 60 mg IM for patients 17-64 years of age; 30 mg for age greater than 65 years or body weight less than 110 pounds, or in the presence of renal impairment.

Topical local anesthesia and vasoconstriction with cottonoid pledgets placed intranasally were generally left in place for 30 minutes for maximum effect. Typically, 45 minutes or more elapsed from the time administering the ketorolac to the start of the office rhinology procedures.

This author's anecdotal experience with IM ketorolac using similar patients as historical controls in whom IM ketorolac was not used has left a solid impression that IM ketorolac can provide significant additional pain control for more extensive office procedures such hybrid BSD procedures, and in patients who have significant concerns about pain especially those with significant anxiety. No problems were encountered of any kind with utilization of IM ketorolac and was well tolerated.

This communication is a retrospective review with a small number of patients and therefore has significant inherent limitations with interpretation. As aforementioned, this review was prompted because patients who underwent intramuscular ketorolac as part of their anesthesia protocol for office rhinology appeared significantly more comfortable when compared to similar patients who did not receive intramuscular ketorolac. A prospective evaluation using a clinical research pain control model would be the next step in determining true efficacy.

Concerns of increased bleeding with nonsteroidal anti-inflammatory medications is well known. Perioperative intravenous ketorolac has been associated with an increased risk of bleeding in adult patients undergoing tonsillectomy but not pediatric patients [7]. Intravenous ketorolac has been studied in the patient's undergoing primary endoscopic sinus surgery (in the operating room setting), and a randomized double-blinded clinical trial was published in 2012 which showed no increased risk of bleeding over control patients [8].

In conclusion, IM ketorolac appears to be a safe non-opioid pain control measure that can be used with any topical and infiltrative local anesthesia regimen with or without sedation. It can potentially provide increased pain control resulting in a more pleasant experience for the patient and surgeon, and in patients undergoing more extensive rhinology procedures and anxious patients concerned about pain. Providing additional pain control with IM ketorolac in selected patients could be a significant variable allowing completion of planned office rhinology procedures in unexpectedly difficult cases. A well-designed clinical pain control study using IM ketorolac for office rhinology procedures has merit and should be performed, but until this occurs IM ketorolac is an option for the otolaryngologist that can be implemented now for those who desire an additional safe pain control measure.

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#### Article Information

**\*Correspondence:** Gary J. Nishioka, MD, DMD, FARS, FAAOA  
Willamette Ear Nose and Throat & Facial Plastic Surgery. 3099 River Road S., Salem, Oregon 97302-9754, USA. Email: garyn@entsalem.com

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#### Keywords

Ketorolac; nonsteroidal anti-inflammatory drug; office rhinology; opioid; pain control.

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