



Effect of Pre-emptive Intramuscular Ketorolac on Post-Stent Colic: A Randomized Control Trial

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Introduction

- Ureteral stents placed after ureteroscopy (URS) for nephrolithiasis can be extremely bothersome
- A subset of patients experience debilitating renal colic for hours following stent removal
- Ketorolac is a non-steroidal anti-inflammatory medication that has been demonstrated to improve renal colic

Methods

- **Prospective randomized double-blind controlled trial**
- Eligible patients: undergoing cystoscopy with ureteral stent removal following routine URS
- Patients were randomized to receive either 30mg in 1mL of ketorolac tromethamine (treatment) or 1mL injection of 0.9% normal saline (placebo) immediately prior to office stent removal
- The surgeon, nurse administering the injection, and patient were blinded
- Patients were contacted 24 hours and 7 days following stent removal to assess level of pain using the visual analog pain scale (VAS), renal colic symptoms, use of narcotic, Emergency Department (ED) or urgent clinic visits, and need for surgical/medical interventions related to renal colic

Results

Table 1. Baseline demographic, pre-ureteroscopy stone characteristics, and results

	Group	Control Group (n=62)	Treatment Group (n = 62)	p-value
Demographical/ Surgical Characteristics	Age	56	54	NS
	Female	45%	50%	NS
	Mean BMI	28.9	30.1	NS
	Mean ASA	2.2	2.3	NS
	Mean stone size	9.1	8.9	NS
	Location			NS
		Renal	52%	46%
	Ureteral	19%	26%	
	Both	29%	28%	
Pain Endpoints	Mean stent duration	10.2	9.0	NS
	Mean VAS 24 hours	2.7	2.4	NS
	% pts with VAS ≥ 7 at 24 hours	14%	17%	NS
	Subjective renal colic	16%	10%	NS
	Narcotic use at 24 hours	27%	26%	NS
	Mean Vas 7 Days	0.5	0.9	NS
	% pts with VAS ≥ 7 at 7 Days	2%	3%	NS
Injection Safety	Mean days missed work (if working)	3.2	3.8	NS
	Injection site reaction	0%	0%	NS
	Injection site pain	2%	2%	NS
	Injection complication	0%	0%	NS
Unplanned Return Encounter	Return to clinic or ED	8/62 (13%)	1/62 (2%)	0.032

- N = 124 (62 control group, 62 treatment group)
- Median age, gender, mean BMI, mean stone size, stone location, and stent duration were similar
- Pain scores and % patients with severe (≥7 VAS) pain were similar
- Narcotic pain medication use following stent removal was similar
- No patients in either group developed an injection site reaction or complication
- **Significantly fewer renal colic-related ED/clinic visits in the treatment groups**
 - **8/62 (13%) control vs (1/62) 2% treatment (p = 0.032)**

Conclusions

While having no impact on subjective pain, intramuscular injection of ketorolac at the time of stent removal **significantly decreases renal colic-related returns to the ED or Urology Clinic.** For patients eligible to receive ketorolac, clinicians should consider its administration at the time of stent removal.

