

Endourology Society 2018 Award Report

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Research Review

Pediatric Magnetic Stents

The project submitted to the Endourology Society for consideration of an award was the stenting of pediatric patients with magnetic stents. This study aimed to establish safety in the pediatric population as these stents had been proven safe and effective in adults, but no trials existed in pediatric patients. We believed this to be important because pediatric patients require general anesthetic for any procedure which requires a stent to be placed and a repeat dose at time of removal. Magnetic stents would allow for anesthetic free removal and avoidance of anesthetic. The affects of general anesthetic on pediatric patients is unclear, varied studies have described outcomes with increased learning difficulty and development concerns, what is clear is that minimizing time and exposure to general anesthetic is essential.

Our study involved enrolling pediatric patients into proof of concept study. Any pediatric patient who required stenting was eligible for enrollment. The only exclusion criterion was anticipated stenting of greater than 4 weeks. A total of 8 patients were enrolled. The ages ranged from 2-16 years. The patients had undergone ureteroscopy, ureteric reimplantation and pyeloplasty. The ages ranged from 2 -16 years. There was a 3:1 male to female ratio. The stents were removed in the clinic using 2% lidocaine jelly and a modified magnetic tip catheter. Retrieval was possible with ease in 7/8 patients. There were no complications. The single 2-year-old male was noted to be a difficult catheterization. He was taken to the OR for removal. This pilot study was presented at the Canadian Urological Association 2018 meeting in Halifax, Nova Scotia.

We then collaborated with the urology team from Université Laval. They had conducted a similar proof of concept study. We purposed to continue recruiting patients and co-write a manuscript which outlined our combined experiences with the ease of stent retrievability and have a more sizable cohort. The team from Laval had collected data of intra operative time for retrieval. We retrospectively reviewed our patients and obtained the same. We developed a cost effectiveness argument for the use of stents as well as emphasizing patient safety. This collaborative manuscript was developed after the meeting and has been submitted for publication. We hope to be hearing from reviewers about any reviews soon.

Stone Management in Western Canada

Another one of our summer projects, one not outlined in the original application was a continuation of a retrospective review of kidney stone patients presenting to the emergency department in Calgary, Alberta and Vancouver, British Columbia. Our intent was this study was to compare management in terms of urological intervention at both sites and rates of urological

readmission or rescue intervention within 60 days following the initial presentation. We reached a total of 3283 CT confirmed stones. Calgary had 1959 patients and Vancouver had 1324. We found that Calgary had a 61% intervention rate and that Vancouver had a 31% intervention rate. Calgary intervened on 52% of patients at the time of first visit and Vancouver intervened on 8%. The table below stratifies rate of readmission or rescue intervention at each site stratified by stone size.

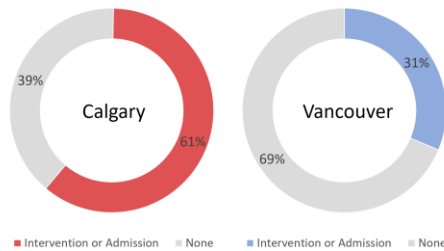


Fig 1. Portion of patients with intervention or admission in each Calgary and Vancouver.

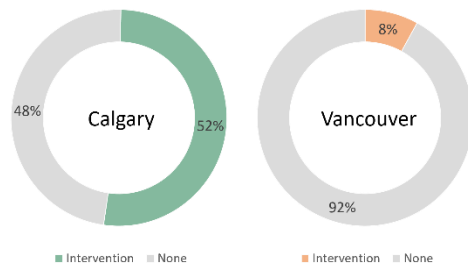


Fig 2. Portion of patients with intervention on first presentation in each Calgary and Vancouver.

Size	Calgary % & N	Vancouver % & N	CI	p
<2 mm	13.6% 6	6.5% 2	-8.9 – 23.3	0.5
2-4.9 mm	14.0% 132	10.0% 73	0.7 – 7.2	0.02
5-6.9 mm	24.8% 129	38.4% 128	7.0 – 20.3	<0.001
7-9.9 mm	25.4% 80	56.0% 89	21.0 – 40.1	<0.001
≥10 mm	40.6% 54	70.8% 51	15.7 – 44.7	<0.001

Table 1. 60 day readmission or intervention rates stratified by stone size between Calgary and Vancouver.

An example of interpreting the table: the first row shows that rates of readmission in Calgary for stones less than 2 mm was 13.6% or 6 patients compared to Vancouver at 6.5% or 2 patients. Our draw from this study was that the intervention prone Calgary had significantly lower rates of rescue intervention or admission for patients with stones larger than 5 mm. While Vancouver had lowered rates of rescue intervention or admission for stones smaller than 4.9 mm. We were able to characterize the intervention rates of the centers. Our data also suggests that medically expulsive therapy for stones <5mm and intervention for >5mm stones may reduce rates or readmission or need for rescue intervention. This study was presented at the Canadian Urological Association 2018 meeting in Halifax, Nova Scotia.

Experience

The time working on ethics, writing up the methodologies, submitting the project for an award, collecting data, submitting the project to a national meeting and finally working on a manuscript has been incredibly rewarding. I do not have formal research training prior to my medical education, I found this experience invaluable in contributing to my abilities as a researcher and as a physician period. I have worked with the urologists in Calgary on many projects and I am

slowly becoming more confident in my abilities. I am interested in researching as a part of my career will be looking to pick up a research-based master's degree during my residency. The grant award was used to subsidize the cost travel and stay for the conference which was an incredible honor as many peers who were also presenting were not afforded similar opportunity and were attending without support. Thank you for supporting me in an endeavor that has been educational and informed my future career plans. I hope to publish the pediatric stent project, I believe magnetic stents will be standard of practice and presentations/publications will make that happen sooner.

Abstracts from the Canadian Urological Association Meeting

Characterizing renal colic management and outcomes in Western Canada

Navraj Dhaliwal, Bruce Gao, Bryce Weber, Ravneet Dhaliwal, Joel Teichman, Kevin Carlson, Eric Grafstein, Heidi Boyda, Mike Law, and Grant Innes

Introduction

Renal colic affects 10% of the population and is often managed with medical expulsive therapy or early urological intervention. Calgary and Vancouver are two large stone centres with differing approaches to acute renal colic, but comparable patient demographics. We evaluated rates of urological intervention and admission, as well as the need for rescue intervention or readmission at each site.

Methods

We retrospectively reviewed all 2014 Calgary and Vancouver patients with an index visit for renal colic. Emergency department (ED) databases were used to collect arrival mode, triage category, and patient demographics. Regional hospital databases were used to collect ED visits, admissions, and urological intervention. The primary outcome was urological intervention or admission within 60 days of the first visit.

Results

A total of 3283 patients with computed tomography-confirmed stones were characterized. Calgary and Vancouver had similar stone and patient demographics. Calgary patients were more likely to undergo urological intervention or admission than Vancouver patients (60.9% vs. 31.3%; $p < 0.001$). Calgary patients also had higher intervention rates on their first presentation (52.1% vs. 7.5%; $p < 0.001$). For stones less than 5 mm, readmission or rescue intervention occurred significantly less in Vancouver. Conversely, for stones greater than 5mm, readmission or rescue intervention occurred significantly less in Calgary.

Conclusions

Calgary patients were more likely to undergo urological intervention or admission than Vancouver patients. Furthermore, our data suggest that medical expulsive therapy for smaller stones (< 5 mm) and early urological intervention for large stones (> 5 mm) reduces the need for

readmission or rescue intervention. We are currently launching a prospective trial between Calgary and Vancouver to better evaluate renal colic, management, and the effect on patient quality of life.

A pilot study using magnetic stents in pediatric patients

Navraj Dhaliwal, Bruce Gao, Ravneet Dhaliwal, Mutaz Farhad, Carolina Fermin–Risso, Anthony Cook, and Bryce Weber

Introduction

Ureteral stents with magnetic tips (Blackstar[®]) were recently approved for use in Canada. Traditionally, pediatric stent insertion and removal is done under general anesthetic. Unfortunately, general anesthetic has been associated with potential learning difficulty and developmental issues.¹ With magnetic stents shown to be safe and effective in adults and removable without general anesthetic,^{2,3} these stents have potential to reduce anesthetic–associated morbidity in pediatric patients.

Methods

Postoperative ureteroscopy, ureteric re–implantation, and pyeloplasty patients at the Alberta Children’s Hospital from September 2017 to January 2018 were included in this review. The magnetic stents used were from a product line produced for children with lengths varied from 12–24 cm. Patients ages ranged from 2–16 years and included both genders. Patients requiring stenting longer than four weeks were excluded. Blackstar[®] stents were removed using a magnetic retrieval device lubricated with 2% lidocaine jelly in clinic.

Results

A total of eight stents were used, of which seven were retrieved without needing endoscopy. The patient requiring cystoscopy for removal was a two–year–old male and was difficult to catheterize. There were no complications.

Conclusions

Magnetic stents may have the potential to reduce general anesthetic exposure for pediatric patients. At our centre, we were able to use these stents for anesthetic–free removal in a variety of pediatric procedures. This is the first report of successful use of Blackstar[®] magnetic stents in a pediatric population. We are currently working on a more comprehensive prospective study with parental survey data.