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POD-5
The Optilume™ drug-coated balloon for recurrent anterior urethral strictures: Three-year results for the ROBUST I study

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Introduction: Mechanical dilation and direct visualization internal urethrotomy are the most widely used treatments for urethral stricture disease in Canada, but recurrence rates are high after re-treatment. This study investigates the safety and efficacy of the Optilume™ paclitaxel-coated balloon for treatment of recurrent anterior strictures.

Methods: Men with recurrent bulbar strictures ≤2 cm with 1–4 prior endoscopic treatments were treated with the Optilume drug-coated balloon. Patients have been followed at three months, six months, and annually through three years. The primary safety endpoint was serious urinary adverse events. The primary efficacy endpoint was the proportion of subjects with ≥50% improvement in International Prostate Symptom Score (IPSS) at three years. Subjects receiving secondary treatment were treated as failures for this endpoint. Secondary outcomes included quality of life, freedom from repeat intervention, erectile function, flow rate, and post-void residual (PVR) urine volume.

Results: Fifty-three subjects were enrolled and treated; 43 were evaluable at the three-year followup for the primary endpoint. Forty-three percent of men had undergone >1 previous dilations, with a mean of 1.7 prior dilations. There were no serious adverse events related to treatment at three years. Success was achieved in 29/43 (67%), which is consistent with two-year results (Fig. 1). IPSS improved from a mean of 25.2 at baseline to 5.5 at three years (p<0.0001). Freedom from repeat intervention of the study stricture was 33/43 (77%). Quality of life, flow rate, and PVR improved significantly from baseline. There was no impact on erectile function.
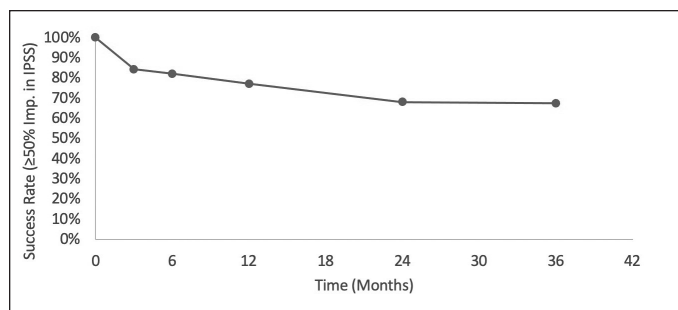
POD-5. Fig. 1. Success rate over time for the Optilume™ drug-coated balloon. Success defined as ≥50% improvement in IPSS score without repeat intervention.

Conclusions: Subjects with recurrent bulbar strictures treated with Optilume paclitaxel-coated balloon exhibited significant improvement in symptomatic and functional outcomes through three years. The rate of success is consistent with reported two-year outcomes. Long-term followup will continue through five years in the ROBUST I study and a randomized study is ongoing.

MP-21
Impact of delayed recognition of iatrogenic ureteric injury in a retrospective population-based study

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Introduction: Iatrogenic ureteric injuries (IUI) are rare but can lead to significant consequence if unrecognized at the time of injury. In this population-based study, we compare the impact of immediate vs. delayed recognition of IUI on patient, cost, and healthcare system outcomes.

Methods: We conducted a population-based, retrospective cohort study on patients who had a diagnosis of an IUI from 2003–2018. The primary independent variable was the time of diagnosis of IUI. The primary outcomes were hydronephrosis or ureteric stricture (composite outcome) and renal impairment. We also evaluated each primary outcome separately. Secondary outcomes included total direct healthcare costs and patient healthcare use.

Results: We identified 1193 patients who experienced an IUI, 25.2% of whom had a delayed recognition (diagnosis of IUI ≥1 day after the index surgery date). Late delayed recognition of IUI (≥14 days after the index surgery) was associated with hydronephrosis or stricture in one year following treatment of IUI (odds ratio [OR] 2.48, 95% confidence interval [CI] 1.77–3.46, p<0.0001) and renal impairment in two years following treatment of IUI (OR 3.20, 95% CI 2.11–4.88, p<0.0001) as compared to immediate diagnosis. Patients who had late delayed recognition of IUI incurred healthcare costs three times that of the immediate-diagnosis group (risk ratio [RR] 2.26, 95% CI 2.05–2.49, p<0.00001). They also had twice the mean number of emergency department visits (incidence rate ratio [IRR] 2.46, 95% CI 2.06–2.93, p<0.0001), hospitalizations (IRR 1.89, 95% CI 1.71–2.09, p<0.0001), and outpatient urology visits (IRR 1.67, 95% CI 1.50–1.86, p<0.0001) as compared to the immediate-recognition group.

Conclusions: In this population-based study, delayed recognition of IUI was associated with increased rates of adverse clinical outcomes, as well as increased healthcare costs and utilization. These findings underscore the importance of identifying IUIs at the time of injury.

MP-22
Contemporary risk factors for ureteral stricture following renal transplantation

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Introduction: Ureteral stricture after renal transplant increases patient morbidity and often requires complex surgical repair.[1] Most studies assessing risk factors for such strictures are outdated. The objective of this study was to identify contemporary risk factors for post-renal transplant ureteral stricture.
Methods: A retrospective analysis was performed on all renal transplant patients at Vancouver General Hospital from 2008–2019. Demographics, clinical parameters, and outcomes were compared between patients who did and did not develop ureteral strictures. Putative risk factors for ureteral stricture were analyzed using logistic regression.
Results: A total of 1188 patients were included, with a mean followup of 61.9±40.8 months. Ureteral stricture occurred in 26 patients (2.2%) at a median of 58 days post-transplant (interquartile range [IQR] 28–90 days). Stricture patients had no demographic differences compared to non-stricture patients but had significantly higher rates of postoperative complications (wound dehiscence, abscess, and urinary tract infection), longer hospital stays, and decreased renal function one-year post-transplant (all p<0.05). On multivariable analysis, cold ischemia time >445 minutes (odds ratio [OR] 4.4, confidence interval [CI] 1.1–18.1, p=0.040), acute rejection (OR 2.8, CI 1.1–7.4, p=0.039), and postoperative complications (OR 4.4, CI 1.7–11.4, p=0.002) were risk factors for stricture. Expanded criteria donation was protective (OR 0.36, CI 0.13–0.98, p=0.45). Approximately 1/3 of strictures were treated with balloon dilatation, 1/3 with surgery, and 1/3 were managed through stenting alone.
Conclusions: Risk factors for ureteral stricture were prolonged cold ischemia time, acute rejection, and postoperative complications, specifically infectious complications. This highlights the importance of continued efforts to reduce ischemia time and acute rejection with advances in immunosuppression, and to minimize postoperative infections. Larger, multicenter studies are warranted.
Reference
1. Giessing M. Transplant ureter stricture following renal transplantation: Surgical options. *Transplant Proc* 2011;43:383-6. https://doi.org/10.1016/j.transproceed.2010.12.014

MP-23
Meta-analysis to study the outcomes of early vs. expectant management of pediatric neurogenic bladder

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Introduction: The indications and outcomes of proactive management of pediatric neurogenic bladder (NB) patients have been unclear. This systematic review and meta-analysis (MA), conducted using PRISMA guidelines, reviews the effects of early vs. expectant management of pediatric NB patients.
Methods: We performed a literature search on EMBASE and MEDLINE (January 1, 2000 to January 1, 2020) for primary studies investigating the management of NB in pediatric patients. Early management was defined as use of clean intermittent catheterization (CIC) and/or anticholinergics at presentation, or based on initial high-risk urodynamic findings. Outcomes included risk of secondary vesicoureteral reflux (VUR), upper urinary tract dilatation (UUTD), urinary tract infection (UTI), and renal deterioration on DMSA, which included renal scarring, or loss of differential renal function. The MA was conducted using RevMan 5. The risk of bias (ROB) of the studies was assessed using the ROBINS-I tool.
Results: We included eight cohort studies (583 participants, mean followup duration of 6.2 years) from 990 search results for the MA (Fig. 1). Patients who received early management following initial assessment had significantly lower incidence of secondary VUR (0.33 [0.14, 0.74],
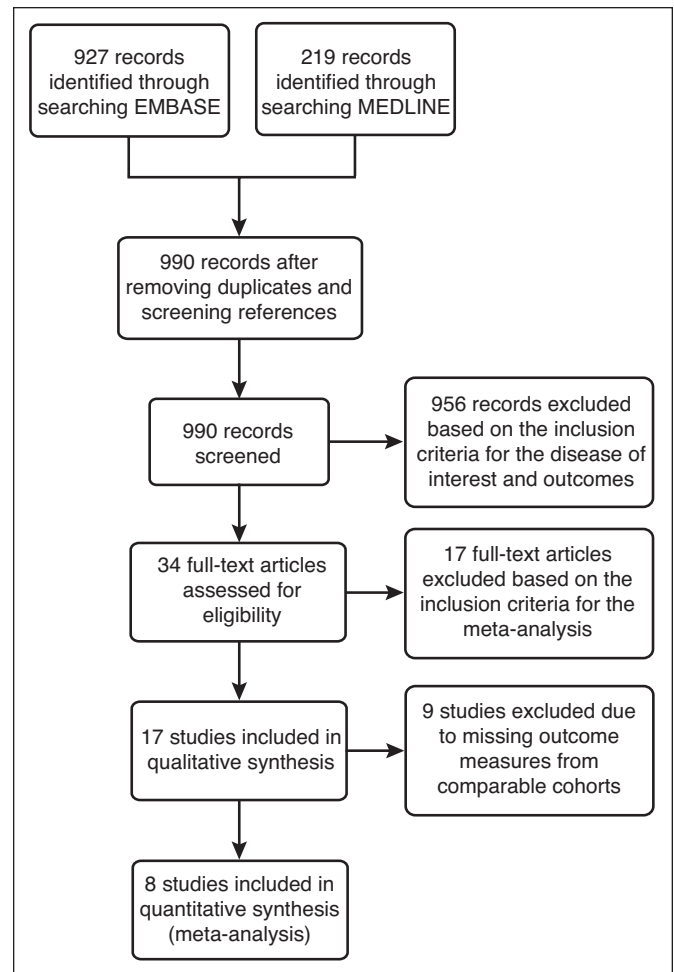
MP-23. Fig. 1. PRISMA flow chart of systematic review.

p=0.007), UTI (0.40 [0.19, 0.85], p=0.02), and renal deterioration (0.39 [0.17, 0.91], p=0.03) compared to patients managed expectantly (Fig. 2). There was no significant difference in the risk of UUTD (0.79 [0.09, 7.02], p=0.83). Finally, three and five of the eight studies were ranked as having moderate and serious ROB, respectively.
Conclusions: Despite the high ROB of the studies, a signal favoring early management of NB in pediatric patients was detected. Expectantly managed NB patients potentially have a 2.5 times higher risk of secondary VUR, UTI, and renal deterioration during followup. Further randomized trials or well-defined prospective studies with long-term followup should be conducted to confirm this finding.

MP-24
Can we improve the usefulness of the diuretic renogram in the diagnosis of ureteropelvic junction obstruction? Introduction of Mercaptoacetyltriglycine – Suspected Obstruction Scoring System (MAG-SOS)

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Introduction: Mercaptoacetyltriglycine (MAG-3) renogram is one of the gold standard diagnostic tools of ureteropelvic junction obstruction (UPJO); however, there are no widely agreed indications of pyeloplasty based on MAG-3 findings. In this study, we introduce a renogram scoring system that can help improve the prognostic value of MAG-3 renogram and in the decision-making of pyeloplasty.

A

Study or Subgroup	Early Events	Total	Expectant Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Elzeneini 2018	19	101	39	100	34.9%	0.3624 [0.1910, 0.6878]
Ghorbanpoor 2018	8	44	0	11	6.9%	5.3562 [0.2865, 100.1242]
Kari 2009	1	8	11	25	10.7%	0.1818 [0.0194, 1.7064]
Li 2018	2	40	9	36	16.8%	0.1579 [0.0316, 0.7896]
Timberlake 2017	4	17	16	27	20.4%	0.2115 [0.0544, 0.8229]
Wide 2012	4	23	1	15	10.3%	2.9474 [0.2962, 29.3235]
Total (95% CI)		233		214	100.0%	0.3921 [0.1691, 0.9090]
Total events	38		76			

Heterogeneity: Tau² = 0.42; Chi² = 8.55, df = 5 (P = 0.13); I² = 42%
Test for overall effect: Z = 2.18 (P = 0.03)

Odds Ratio M–H, Random, 95% CI
0.01 0.1 1 10 100
Favours Early Favours Expcetant

B

Study or Subgroup	Early Events	Total	Expectant Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Ghorbanpoor 2018	5	44	0	11	6.4%	3.2025 [0.1645, 62.3369]
Kochakarn 2004	9	36	14	31	44.4%	0.4048 [0.1439, 1.1385]
Li 2018	10	40	19	36	49.2%	0.2982 [0.1131, 0.7865]
Total (95% CI)		120		78	100.0%	0.3976 [0.1857, 0.8515]
Total events	24		33			

Heterogeneity: Tau² = 0.06; Chi² = 2.27, df = 2 (P = 0.32); I² = 12%
Test for overall effect: Z = 2.37 (P = 0.02)

Odds Ratio M–H, Random, 95% CI
0.01 0.1 1 10 100
Favours Early Favours Expcetant

C

Study or Subgroup	Early Events	Total	Expectant Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Kari 2009	5	8	23	25	16.1%	0.1449 [0.0190, 1.1077]
Lee 2019	2	21	6	48	23.4%	0.7368 [0.1360, 3.9916]
Li 2018	7	40	15	36	60.5%	0.2970 [0.1038, 0.8493]
Total (95% CI)		69		109	100.0%	0.3271 [0.1445, 0.7406]
Total events	14		44			

Heterogeneity: Tau² = 0.00; Chi² = 1.54, df = 2 (P = 0.46); I² = 0%
Test for overall effect: Z = 2.68 (P = 0.007)

Odds Ratio M–H, Random, 95% CI
0.01 0.1 1 10 100
Favours Early Favours Expcetant

MP-23. Fig. 2. Forest plot pooled effect estimates for risk of ***(A)*** renal deterioration; ***(B)*** urinary tract infection; and ***(C)*** secondary vesicoureteral reflux. Comparison: early vs. expectant management of neurogenic bladder; statistical model: dichotomous with random effect model (OR and 95% CI).

Methods: We retrospectively reviewed consecutive pyeloplasties for antenatal hydronephrosis (AHN) from 2015–2020. A control group was included of non-operatively managed SFU grade 3 and 4. We excluded patients who presented with urinary tract infection and loin pain. The initial renal ultrasound and preoperative MAG-3 Lasix renogram were reviewed for differential renal function (DRF), type of renogram curve, and tracer washout half-time (T1/2). The MAG-Suspected Obstruction Scoring (SOS) system is illustrated in Table 1. A ROC curve was used to evaluate the cutoff points that can predict obstruction. A multivariate, linear regression model was used to assess the best renogram parameter that can predict surgical intervention.

Results: Of 117 patients, we included 97 patients with 101 renal units. Patients' demographics and renogram data are presented in Table 2. The median age for pyeloplasty was 4.4 months (1–35.3). The MAG-SOS showed significant results in predicting pyeloplasty (area under the curve [AUC] 0.959, 95% confidence interval [CI] 0.932–0.987, p<0.005) (Fig. 1). A score of 5 is 100% specific for obstruction. Sixty-five of 101 units required surgical intervention (64.4%) and had a MAG-SOS score of ≥5, while all units of the control group had a range of score 0–4 (Fig. 2). Using the multivariate analysis, the MAG-SOS system showed to the only independent predictor for pyeloplasty (hazard ratio 0.15, 95% CI 0.12–0.18, p<0.001).

Conclusions: MAG-SOS system is based on three renogram parameters. It showed to be a useful tool that can predict pyeloplasty; moreover, it ss the only independent predictor in the multivariate analysis. A score of 5 has 100% specificity for patients having a pyeloplasty performed. Prospective studies are required to confirm the usefulness of this novel tool.

MP-25
Surgical outcomes in patients undergoing ileovesicostomy in Edmonton over the past 12 years

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Introduction: Children born with spina bifida and other congenital abnormalities are suspect to significant urological complications, such as kidney injury, recurrent urinary tract infection (UTI), and incontinence. Management of these patients is challenging, and surgical diversion offers a possible solution. Our objective was to assess overall short- and medium-term outcomes of an incontinent ileovesicostomy in this complex pediatric and adult patient population.

Methods: We reviewed postoperative outcomes of all patients who underwent an ileovesicostomy for various indications from 2006–2018. The primary outcomes were preservation of kidney function based on pre- and postoperative creatinine. The change in creatinine was evaluated with repeated-measures ANOVA. Secondary outcomes included change in hydronephrosis, recurrent UTIs, incontinence, and development of bladder stones.

Results: A total of 18 patients underwent an ileovesicostomy through the specified time frame by a single surgeon. The median age at surgery was 18 (range 8–42) and the median duration of followup was 27 months (range 0–80). Spina bifida was the majority underlying diagnosis at 78%, and high bladder pressures (dLPP >30 mmH$_2$O) was the majority indication for surgery at 56%. Mean preoperative creatinine was 54 umol/L. Mean short-term postoperative creatinine was 55 umol/L (p>0.05) and mean medium-term postoperative was 52 umol/L (p>0.05), neither of which were statistically significantly elevated from preoperative creatinine. The portion of patients with hydronephrosis, recurrent UTIs, and incontinence all decreased postoperatively. The portion of patients of bladder stones increased postoperatively.

Conclusions: Ileovesicostomy is a safe procedure and can have excellent short- and medium-term urological outcomes.
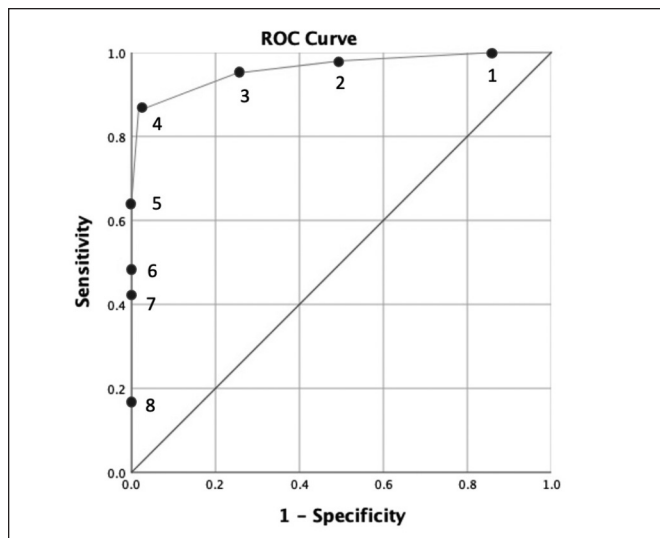
MP-24. Fig. 1. ROC curve shows the value of MAG-SOS in pyeloplasty prediction.
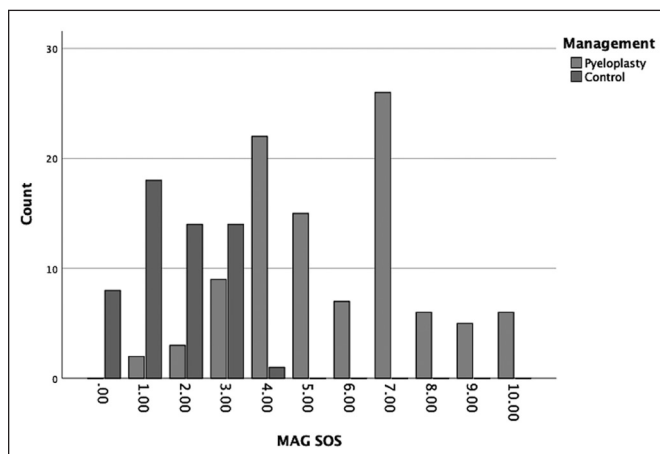
MP-24. Fig. 2. Bar chart demonstrates the distribution of different MAG-SOS scores according to management groups.

MP-24. Table 1. MAG-SOS system

Parameter	Score
DRF	
DRF >40–80%	0
DRF 20–40%	3
DRF >80% (single kidney)	4
T ½ (based on modified T1/2 cutoffs)	
<5 minutes	0
5–20 minutes	1
>20–50 minutes	2
>50–75 minutes	3
>75 minutes	4
Type of renogram curve (based on O'Reilly and Homsy curves)	
Type 1 (normal)	0
Type 2 (obstructed)	3
Type 3A (hypotonic)	1
Type 3B (equivocal)	2
Type 4 (delayed decompensation)	2

MP-24. Table 2. Patients' demographics and renogram data

		Pyeloplasty group	Control group
Patients number (units)		97 (101)	53 (55)
Age at presentation in months, median (range)		0.4 (0.03–11.9)	0.7 (0.03–5.5)
Gender	Male, n (%)	70 (72.2)	39 (73.5)
	Female, n (%)	27 (27.8)	14 (26.5)
Side	Right, n (%)	38 (37.6)	20 (36.4)
	Left, n (%)	63 (62.4)	35 (63.6)
Laterality	Unilateral, n (%)	92 (94.8)	51 (96.2)
	Bilateral, n (%)	5 (5.2)	2 (3.8)
SFU at presentation	Grade 3, n (%)	30 (29.7)	37 (67.3)
	Grade 4, n (%)	71 (70.3)	18 (32.7)
Age at renogram in months, median (range)		1.9 (0.9–21)	3.2 (0.83–15)
DRF median (range)		44% (20–100)	51% (40–65)
T half median (range)		36.3 min (4–181)	5.8 min (0–29)
Type of curve			
Type 1 (normal), n (%)		1 (0.9)	10 (18.2)
Type 2 (obstructed), n (%)		49 (48.6)	0
Type 3A (hypotonic), n (%)		10 (9.9)	30 (54.5)
Type 3B (equivocal), n (%)		41 (40.6)	15 (27.3)
Type 4 (delayed decompensation), n (%)		0	0