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ERAS In Reducing Postoperative Urinary Retention

A Randomized Controlled Trial

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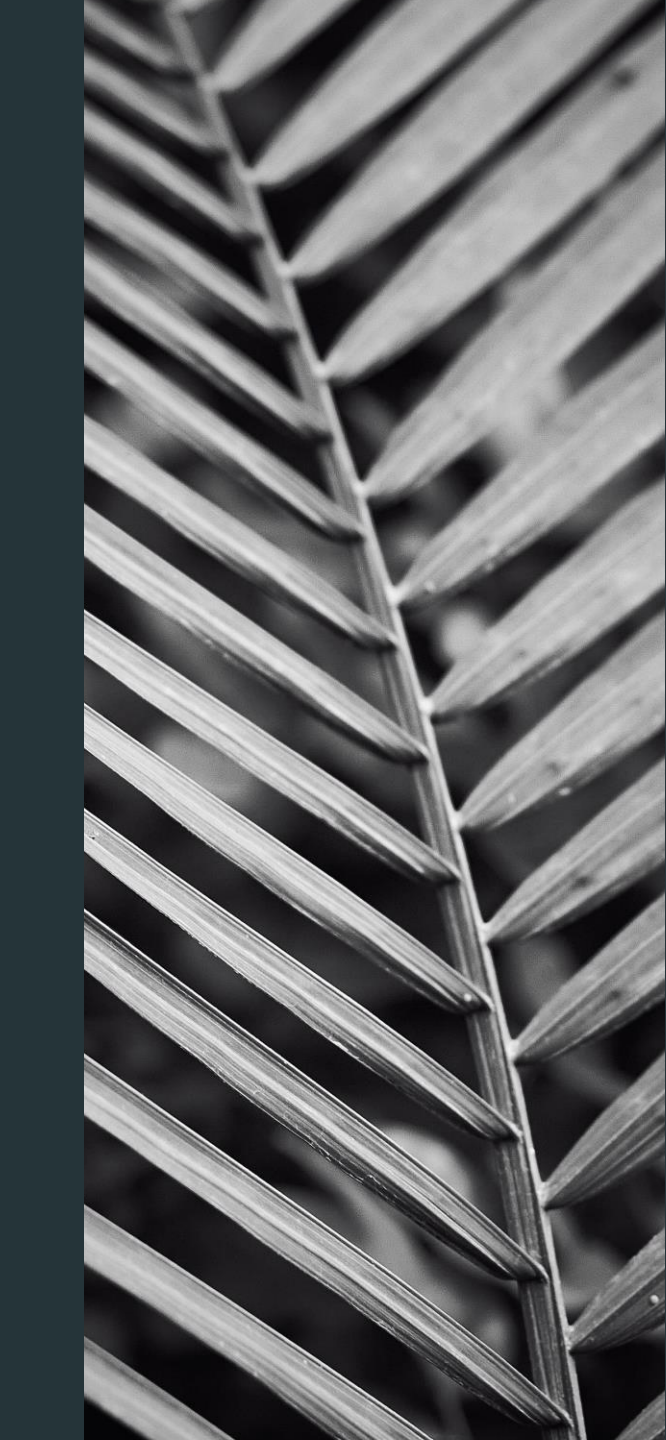


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Overview



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Introduction



What is postoperative urinary retention?

Postoperative urinary retention (POUR) is the inability to void after surgery despite a full bladder, often requiring catheterization or bladder decompression.

It is typically defined as failure to void within **6–8 hours postoperatively** or a **post-void residual volume >300–400 mL**.

Clinically, POUR can cause **significant discomfort** and **may delay postoperative recovery and discharge**.

Incidence:



01 General surgical population: ~3.8%

02 Anorectal surgery overall: 1–52%

Reported incidence varies widely across studies, largely due to differences in surgical procedures, anesthetic techniques, and definitions of POUR.

It is one of the most common complications after anorectal surgery, and may contribute to unplanned ED visits and readmissions following ambulatory procedures.



The Link Between POUR and Anorectal Surgery

Why Anorectal Surgery? — The Pathophysiological Link

Shared Pelvic Innervation (S2–S4)

The anorectal region and lower urinary tract share the same sacral nerve plexus (S2–S4). Surgical stimulation disrupts the afferent/efferent micturition reflex arc.

Pain-Mediated Sphincter Spasm

Postoperative anorectal pain triggers reflex alpha-adrenergic activity → increased bladder outlet resistance → urinary obstruction.

Spinal Anesthesia Block

Spinal/epidural anesthesia eliminates sensory bladder perception and blocks the sacral parasympathetic loop governing the voiding reflex, causing transient but clinically significant urinary retention.

Fluid Overload → Overdistension

Excess intravenous fluids (>1,000 mL) cause rapid bladder filling exceeding detrusor contractile capacity → myogenic failure.

Independent Risk Factors

- Female sex ($p=0.007$)
- Male + BPH ($p=0.001$)
- VAS Pain Score > 6 ($p=0.002$)
- Patient-Controlled Epidural Analgesia
- Surgery Duration > 30 min
- IV Fluids > 1,000 mL
- No. hemorrhoids resected ≥ 3
- Diabetes Mellitus



Our Protocol:

Trial Design & Methodology

Methodology

01 Design: Prospective, randomized, double-blind, controlled trial; two parallel arms (ERAS vs. Routine).

Primary endpoint: 72-hour postoperative urinary retention after anal surgery.

02 Setting: Mansoura University Hospital.

03 Randomization: 1:1 to ERAS pathway (must fulfil all 13 items) or Routine pathway (standard practice).

04 Follow-up: Phone call at 72h; outpatient visits to 30 days.
(+ any time for adverse events).

Methodology

05 Participants:

Inclusion: Age 18–90, both sexes, benign anorectal conditions (chronic anal fissure / hemorrhoids / fistula-in-ano)

Exclusion: Age <18 or >90; pregnancy; relevant urological disease (BPH, prostate cancer, urethral stricture, detrusor dysfunction) or prior urological surgery; permanent catheter; intraoperative urological procedure; urinary diversion; severe cognitive impairment

Our ERAS Protocol — Perioperative Pathway

PRE-OPERATIVE

- Patient education & counseling
- Pre-op carbohydrate loading (2h before)
- Pre-emptive analgesia (NSAIDs/paracetamol)
- Alpha-blocker (Tamsulosin) in high-risk males
- Avoid prolonged fasting (clear fluids up to 2h)
- Bowel prep only if indicated

INTRA-OPERATIVE

- Monitored Anesthesia Care (MAC) preferred
- Local/regional block: perineal infiltration
- IV fluid restriction: target < 500 mL
- Short-acting spinal agent (low-dose)
- Multimodal pain control intraoperatively
- Avoid unnecessary catheterization

POST-OPERATIVE

- Early mobilization (within 2–4 hours)
- Multimodal analgesia (no routine opioids)
- Bladder scan at 4 & 6 hours post-op
- Catheterize if unable to void by 6h OR vol > 400 mL
- Oral fluids encouraged immediately
- Post-discharge phone follow-up (24h)

The 13 ERAS Elements — Evidence-Based Checklist

1

Preoperative Patient Education

Reduces anxiety; improves compliance

2

Carbohydrate Loading (2–3h pre-op)

Reduces insulin resistance & stress response

3

Avoid Prolonged Fasting

Clear fluids up to 2h safe; reduces thirst & dehydration

4

Pre-emptive NSAIDs / Paracetamol

Reduces opioid need; lowers pain-triggered POUR

5

Alpha-blocker (Tamsulosin) in High-Risk Males

Reduces POUR significantly in BPH patients

6

Preferred: MAC over Spinal Anesthesia

Less S2–S4 block; faster micturition reflex return

7

Local / Regional Perineal Block

Reduces systemic drug load & pain-mediated retention

8

IV Fluid Restriction (< 500 mL intra-op)

Prevents bladder overdistension; reduces POUR 50%

9

Multimodal Analgesia (Opioid-Sparing)

Opioids inhibit detrusor; multimodal approach safer

10

Avoid Routine Urinary Catheter

Decreases UTI; promotes early voiding

11

Early Mobilization (2–4h post-op)

Stimulates micturition; reduces retention

12

Bladder Ultrasound Monitoring (4h & 6h)

Objective assessment; guides catheterization decision

13

Post-Discharge Phone Follow-Up (24h)

Identifies delayed POUR; reduces re-admissions

Research Results



Case flow:

Enrolled: 108 (ERAS 54 / Routine 54) → Excluded: 8, 4/arm
(insufficient follow-up data) →
Final analyzed cohort: 100 (ERAS 50 / Routine 50)
meeting the protocol-defined target sample size of 50 patients/arm.

POUR outcomes:

Group	POUR cases	Rate
Routine	3 (2 male, 1 female)	6%
ERAS	2 (both male)	4%
Overall	5/100	5%

Preoperative patients and diseases basics characteristics

Variable	ERAS (n=50)	Routine (n= 50)	P value
Mean age (± SD) years	42.7 ± 12.8	42.4 ± 13.5	0.916
Sex (%)			
Male	35(70%)	30(60%)	0.402
Female	15(30%)	20(40%)	
Median BMI (range) kg/m ²	28.2 (20 - 44)	28 (18 - 50)	0.344
ASA score (%)			
I	37 (74%)	39 (78%)	0.578
II	12 (24%)	11 (22%)	
III	0 (0%)	0 (0%)	
IV	1 (2%)	1 (2%)	
V	0 (0%)	0 (0%)	
Smoking (%)	18(36%)	9(18%)	0.043

Preoperative patients and diseases basics characteristics

Comorbidities (%)				
DM	5 (10%)	3 (6%)	0.715	
HTN	1 (2%)	0 (0%)	1.000	
Cardiac	2 (4%)	8 (16%)	0.092	
Virus C	2 (4%)	0 (0%)	0.495	
Epilepsy	1 (2%)	0 (0%)	1.000	
Preoperative diagnosis (n%)				
Chronic anal fissure	16 (32%)	10 (20%)	0.135	
Low anal fistula	5 (10%)	10 (20%)		
High anal fistula	24 (48%)	27 (54%)		
Hemorrhoids	5 (10%)	1 (2%)		
Hemorrhoids with anal fissure	0 (0%)	1 (2%)		
Hemorrhoids with anal fistula	0 (0%)	1 (2%)		
Type of procedure done (n%)				
Internal sphincterotomy	16 (32%)	10 (20%)	0.072	
Hemorrhoidectomy	5 (10%)	2 (4%)		
Fistulotomy	5 (10%)	10 (20%)		
Coring fistulotomy & seton	20 (40%)	27 (54%)		
Re-seton	2 (4%)	0 (0%)		
Seton removal	2 (4%)	0 (0%)		
Hemorrhoidectomy & internal sphincterotomy	0 (0%)	1 (2%)		

Preoperative patients and diseases basics characteristics

Median preoperative Wexner constipation score (range)	0 (0 - 8)	0 (0 - 4)	0.459
Median preoperative IPSS score (range)	1 (0 - 27)	0 (0 - 14)	0.024
History of previous UTI (n%)	10 (20%)	10 (20%)	1.000
History of previous urine retention (n%)	5 (10%)	0 (0%)	0.056

Operative time and postoperative pain

Variable	ERAS (n=50)	Routine (n= 50)	P value
Median operative time (range) minutes	36.5 (15 - 90)	30 (15 - 90)	0.096
Median VAS score day of surgery (range)	8 (0 - 10)	8 (5 - 10)	0.318
Median VAS score 3 rd POD (Range)	5 (0 - 10)	5 (1 - 8)	0.674
Need for resecure analgesia day of surgery (%)	42 (84%)	49 (98%)	0.015
Need for resecure analgesia 3 rd POD (%)	42 (84%)	40 (80%)	0.603

Postoperative urine retention outcomes

Variable	ERAS (n=50)	Routine (n= 50)	P value
First time to void postoperative in hours	4 (0.5 - 11)	5 (1 - 9)	0.060
Urine retention within 72 hours (%)	2 (4%)	3 (6%)	0.558
Median number of TWOC (range)	1 (1 - 4)	1 (1 - 5)	0.537
Median number of successful TWOC (range)	48 (96%)	47 (94%)	0.646
Catheter insertion	2 (4%)	3 (6%)	0.646
Mean time of catheter insertion (SD) hours	6 ± 1.4	7 ± 1	0.413
Median residual volume of urine* (range) ml	750 (500 - 1000)	1500 (1000 - 2000)	0.139

TWOC: trial without catheter, **SD:** standard deviation

* drained on catheter insertion

Univariate analysis of risk factors of urine retention

Variable	P value
Median age > 44.5 years	0.706
Sex (Male vs female)	0.951
Median BMI > 28 kg/m ²	0.606
ASA ≥ 2	0.565
Smoking	0.802
DM	0.604
HTN	0.860
Cardiac	0.171
Epilepsy	0.860
Hepatic	0.802
ERAS vs routine group	0.558
History of previous UTI	0.379
History of previous episodes of urine retention	0.687
Median IPPS >1	0.980
Procedure done (Hemorrhoidectomy)	0.003
Median VAS score day of surgery ≥ 8	0.553
Median VAS score 3 rd POD ≥ 5	0.294
Need of resecure analgesic day of surgery	0.580
Need of resecure analgesic 3 rd POD	0.410

SD: standard deviation, BMI: body mass index, ASA: American society of anesthesiology, DM: Diabetes Melituos, HTN: Hypertension, UTI: Urinary tract infection, IPSS: International Prostate Symptom Score, VAS: visual analogue scale, POD: postoperative day

Any P-value colored red is considered significant (≤0.05)

Conclusio



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Conclusion



1. Patients in the ERAS group **resumed spontaneous voiding earlier** than the routine group
2. ERAS was associated **with lower incidence of POUR with a Lower median residual volume of urine on catheter insertion in routine group.** However, all these results were non-significant.
3. **Hemorrhoidectomy was a significant risk factor** for POUR.
4. **Further multicenter, adequately powered randomized controlled trials** are needed to validate our ERAS protocol and more definitively characterize its effect on postoperative urinary retention after anorectal surgery.



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Any Questions?

Thank You



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