



Research Article

Efficacy Of Oral Colchicine After Optical Internal Urethrotomy In Reducing Recurrence Of Urethral Strictures At Tertiary Centres

Dr Babar Ali¹, Dr Partha Protim Mondal², Dr Arnab Maity¹, Prof. Dr. Sandeep Gupta³

¹Senior Resident, Department Of Urology, R G Kar Medical College And Hospital

²Associate Professor, Department Of Urology, R G Kar Medical College And Hospital

¹Senior Resident, Department Of Urology, R G Kar Medical College And Hospital

³Professor And Head Of Department Departments Of Urology R G Kar Medical College And Hospital

OPEN ACCESS

Corresponding Author:

Prof. Dr. Sandeep Gupta

Professor And Head Of Department
Departments Of Urology R G Kar
Medical College And Hospital.

Received: 01-09-2025

Accepted: 10-10-2025

Available online: 24-10-2025

Copyright© International Journal of
Medical and Pharmaceutical Research

ABSTRACT

Background: Optical internal urethrotomy (OIU) is a widely performed procedure for anterior urethral stricture but is associated with high recurrence rates. Pharmacological adjuncts with antifibrotic properties may improve outcomes.

Methods: This prospective study was conducted at R. G. Kar Medical College and Hospital between July 2023 and December 2024. One hundred patients undergoing OIU were randomized equally into two groups: OIU alone (n=50) or OIU plus oral colchicine once daily for two months (n=50). Patients were followed with uroflowmetry at three and six months. The primary outcome was recurrence at six months. Secondary outcomes included maximum urinary flow rate (Qmax) at three and six months. Multivariable logistic regression assessed independent predictors of recurrence.

Results: Recurrence at six months occurred in 38/50 (76%) patients in the OIU-only group versus 21/50 (42%) in the colchicine group (relative risk 0.55, 95% CI 0.39–0.79, $p = 0.001$). Mean Qmax was higher with colchicine at three months (16.1 vs. 13.9 mL/s, $p = 0.0003$) and six months (14.9 vs. 11.5 mL/s, $p < 0.000001$). In adjusted analysis, OIU alone was associated with increased recurrence risk (OR 5.16, 95% CI 2.04–13.06, $p = 0.001$), as was stricture length (OR 2.84, 95% CI 1.31–6.15, $p = 0.008$). Stricture location was not significant.

Conclusion: Adjunctive oral colchicine significantly reduced recurrence and improved urinary flow after OIU. These findings support colchicine as a low-cost, accessible antifibrotic therapy to enhance the durability of endoscopic treatment for urethral stricture.

Keywords: Urethral stricture, Optical internal urethrotomy, Colchicine, Antifibrotic therapy, Recurrence.

INTRODUCTION

Urethral stricture disease remains a challenging urological problem, with recurrence rates reported to be as high as 50–70% following optical internal urethrotomy (OIU). Various pharmacological and intralesional strategies have been investigated to reduce recurrence by limiting the fibro-inflammatory response underlying stricture formation. Gupta et al. (2017) evaluated the role of oral corticosteroids after OIU and reported a reduction in recurrence rates, supporting the rationale for systemic anti-fibrotic therapy [1]. Colchicine, a microtubule inhibitor with established anti-fibrotic and anti-inflammatory properties, has also been explored in this context. In a long-term study, Kurtulus and Akgün (2018) demonstrated that adjunctive colchicine therapy after internal urethrotomy reduced recurrence compared with surgery alone [2].

Despite these findings, recurrence remains a frequent clinical problem after OIU. Issack et al. (2023), in a prospective cohort from Ethiopia, reported high short-term recurrence rates and identified stricture length and site as important predictors [3]. Other pharmacological agents such as intralesional mitomycin C have also shown promise; Ali et al.

(2015) found significantly reduced recurrence with its use in anterior urethral strictures [4]. Nevertheless, durable solutions remain limited, and urethroplasty continues to be considered the definitive long-term treatment option in selected patients, as highlighted by Ahmad et al. (2007) [5]. While innovative approaches including pharmacological modulation of peri-urethral healing have been trialed, some, such as oral ketoconazole for postoperative erection control, illustrate the experimental breadth of adjunctive therapies in stricture management rather than direct anti-fibrotic benefit [6].

Taken together, these observations highlight the need for further evaluation of colchicine as an adjuvant therapy after OIU. Given its established anti-fibrotic mechanism and encouraging preliminary evidence, we conducted a prospective study at a tertiary care centre to assess the efficacy of oral colchicine in reducing stricture recurrence and improving functional outcomes after OIU.

Objectives

The study was designed with the following objectives:

1. To evaluate the efficacy of oral colchicine administered after optical internal urethrotomy (OIU) in reducing urethral stricture recurrence at six months.
2. To compare uroflowmetry outcomes (maximum urinary flow rate, Qmax) at three and six months between patients undergoing OIU alone and those receiving OIU with adjunctive colchicine.
3. To identify independent predictors of recurrence, including treatment modality, stricture length, and location, using multivariable regression analysis.

METHODS

Study Design and Setting

This was a prospective, parallel-group study conducted at R. G. Kar Medical College and Hospital between July 1, 2023, and December 31, 2024. Patients undergoing optical internal urethrotomy (OIU) for anterior urethral stricture were enrolled and followed for six months.

Participants

Adult male patients aged 18–65 years with single, short-segment anterior urethral strictures were eligible. Exclusion criteria included recurrent or multiple strictures, prior urethroplasty, active urinary tract infection, significant comorbidities precluding surgery, or contraindications to colchicine. A total of 100 patients were included and randomized in a 1:1 ratio into two treatment groups.

Intervention

All patients underwent standard OIU. In the intervention arm, patients additionally received oral colchicine once daily for two months postoperatively. The control arm underwent OIU alone. Standard perioperative care was provided in both groups.

Follow-up and Outcome Measures

Patients were evaluated at three and six months postoperatively. The primary outcome was recurrence of stricture at six months, defined by the presence of lower urinary tract symptoms, a maximum urinary flow rate (Qmax) < 10 mL/s on uroflowmetry, and/or the need for repeat intervention. The secondary outcome was Qmax at three and six months, measured by standard uroflowmetry. Stricture characteristics, including length and location, were documented at baseline.

Statistical Analysis

Continuous variables were expressed as mean $\pm$ standard deviation (SD) and compared using Student's *t*-test. Categorical variables were compared using Fisher's exact test. The relative risk (RR) with 95% confidence interval (CI) was calculated for recurrence. Multivariable logistic regression was performed to identify independent predictors of recurrence, including treatment modality, stricture length, and location. A two-sided $p < 0.05$ was considered statistically significant. Analyses were conducted using SPSS version 26 (IBM Corp., Armonk, NY, USA) and R software (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Baseline Characteristics

A total of 100 patients were included, with 50 randomized to undergo optical internal urethrotomy (OIU) alone and 50 to OIU plus adjunctive oral colchicine. The mean age of participants was comparable between the two groups (46.5 vs. 47.0 years). The majority of patients were male, and stricture characteristics, including mean stricture length and location, were similar across groups. Baseline maximum urinary flow rate (Qmax) was also not significantly different. Overall, the two cohorts were well balanced with respect to demographic and clinical variables, as summarized in **Table 1**.

Table 1. Baseline characteristics by treatment group

Variable	OIU only (n = 50)	OIU + colchicine (n = 50)
Age, years (mean)	46.5	47.0
Male, %	94.0	86.0
Stricture length, cm (mean)	1.60	1.63
Bulbar location, %	68.0	74.0
Qmax baseline, mL/s (mean)	6.35	7.48

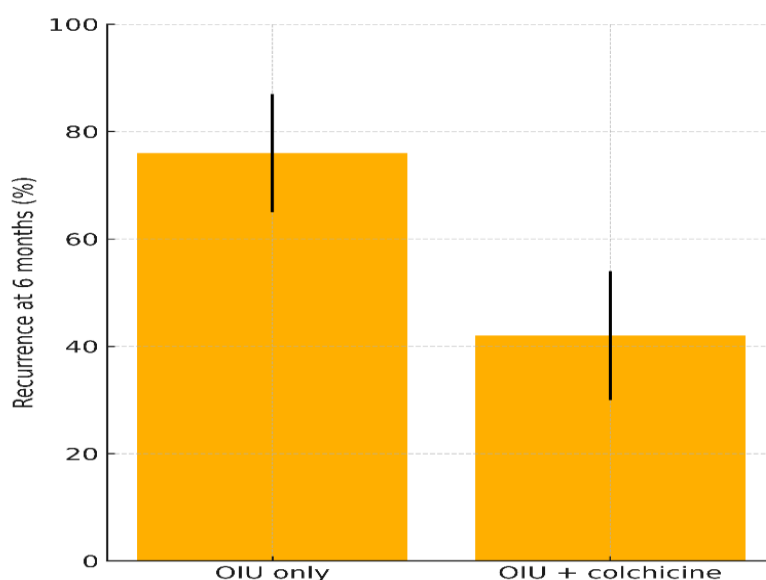
Baseline demographic and clinical characteristics of patients undergoing optical internal urethrotomy (OIU) with or without adjunctive colchicine. Groups were broadly comparable across all variables.

2. Primary Outcome: Recurrence at 6 Months

At six months of follow-up, recurrence of urethral stricture was observed in 38 of 50 patients (76%) in the OIU-only group, compared with 21 of 50 patients (42%) in the OIU plus colchicine group. This difference was statistically significant, corresponding to a relative risk of 0.55 (95% CI 0.39–0.79, $p = 0.001$), indicating a nearly 45% relative reduction in recurrence with adjunctive colchicine. These findings are detailed in **Table 2** and illustrated in **Figure 1**.

Table 2. Recurrence at 6 months after optical internal urethrotomy (OIU)

Outcome	OIU only (n = 50)	OIU + colchicine (n = 50)	Effect estimate
Recurrence, n/N (%)	38/50 (76%)	21/50 (42%)	RR = 0.55 (95% CI 0.39–0.79), $p = 0.001$



Bar plot showing recurrence at six months in patients treated with OIU alone versus OIU plus colchicine. Recurrence was significantly lower in the colchicine group (42%) compared with OIU only (76%), $p = 0.001$.

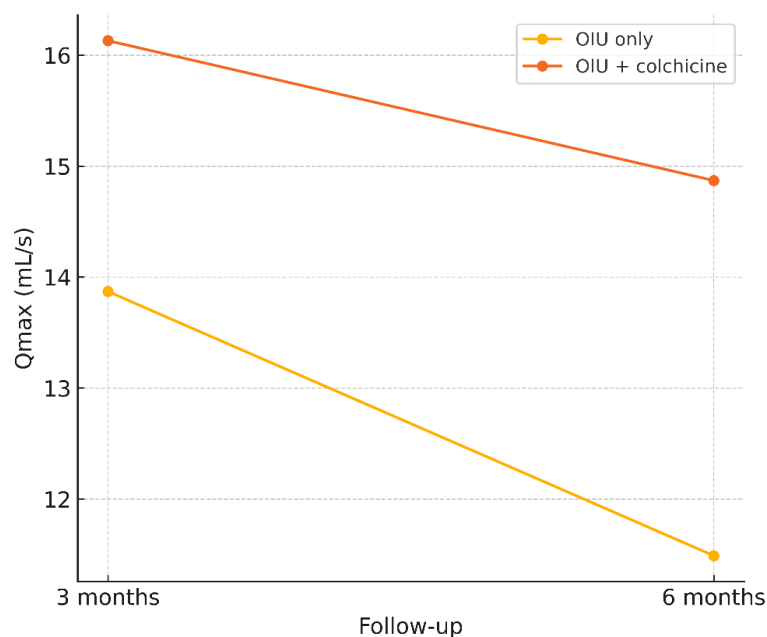
Secondary Outcomes: Uroflowmetry (Qmax)

At three months, mean Qmax was significantly higher in the OIU plus colchicine group compared with OIU alone (16.1 vs. 13.9 mL/s, $p = 0.0003$). This separation widened further by six months, when mean Qmax declined in both groups but remained significantly better in the colchicine group (14.9 vs. 11.5 mL/s, $p < 0.000001$). These findings are presented in

Table 3 and illustrated in **Figure 2**.

Table 3. Maximum urinary flow rate (Qmax) at 3 and 6 months

Time point	OIU only (n = 50)	OIU + colchicine (n = 50)	<i>p</i> -value
3 months (mean, mL/s)	13.87	16.13	0.00031
6 months (mean, mL/s)	11.49	14.87	<0.000001



Line plot of mean maximum urinary flow rate (Qmax) at 3 and 6 months. Flow rates were consistently higher in the OIU plus colchicine group compared with OIU alone ($p < 0.001$).

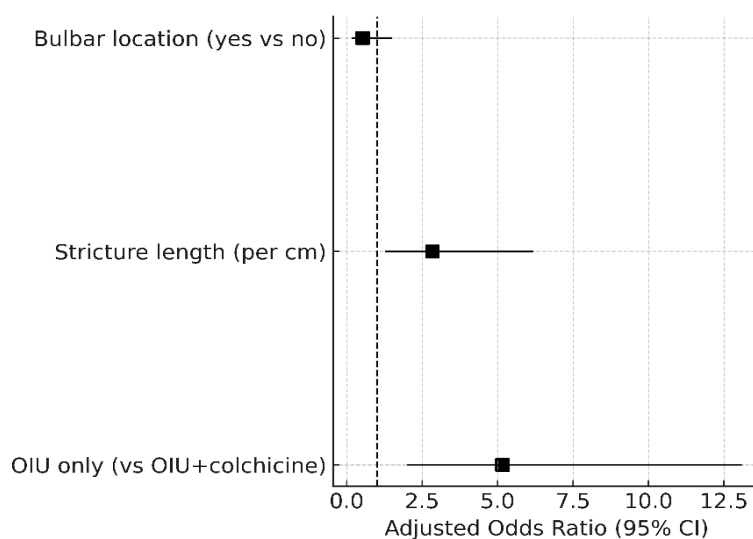
Multivariable Analysis

In logistic regression adjusted for stricture length and location, OIU plus colchicine remained independently associated with a lower risk of recurrence at six months. Patients undergoing OIU alone had over fivefold higher odds of recurrence compared with those receiving colchicine. Longer stricture length was also significantly associated with recurrence, whereas bulbar location was not. Results are summarized in **Table 4**.

Table 4. Multivariable logistic regression for predictors of recurrence at 6 months

Predictor	Adjusted OR	95% CI	p-value
OIU only (vs OIU + colchicine)	5.16	2.04–13.06	0.001
Stricture length (per cm)	2.84	1.31–6.15	0.008
Bulbar location (yes vs. no)	0.53	0.19–1.46	0.219

Figure 3. Predictors of recurrence at six months (multivariable analysis).



Multivariable logistic regression model for recurrence at six months. OIU alone and longer stricture length were independently associated with higher recurrence risk.

Summary of Findings

In this study of 100 patients undergoing optical internal urethrotomy, the addition of oral colchicine was associated with significantly improved outcomes. Recurrence rates at six months were markedly lower in the colchicine group compared with OIU alone, corresponding to a relative risk reduction of nearly 45%. Maximum urinary flow rate (Q_{max}) improved in both groups following surgery but remained consistently higher among patients who received colchicine, with significant differences at both three and six months. Multivariable analysis confirmed that OIU alone and longer stricture length were independent predictors of recurrence, whereas stricture location did not significantly influence outcomes. Collectively, these findings suggest a beneficial role for colchicine in reducing stricture recurrence and maintaining improved urinary flow following OIU.

DISCUSSION

In this prospective study, the addition of oral colchicine after optical internal urethrotomy was associated with a significant reduction in recurrence and improved urinary flow compared with surgery alone. These findings are consistent with the growing emphasis on pharmacological adjuncts in urological practice. Acierno (2022) underscored the persistent clinical burden of urethral stricture disease in general nephrology and urology practice, highlighting the importance of durable treatment strategies [7]. From a broader urological perspective, Shannon and Gornall (2000) noted that stricture management remains a recurrent problem even in pediatric populations, underscoring the universal relevance of novel therapeutic approaches [8].

Our results align with the broader clinical context presented at major urological meetings. The USICON 2014 scientific program emphasized the need for innovations in stricture management, including pharmacological adjuncts [9]. More recently, Luo et al. (2024) reviewed pharmacotherapy in urethral stricture disease and concluded that systemic or local antifibrotic agents may improve outcomes when combined with endoscopic procedures [10]. This supports the rationale for colchicine use, given its well-established anti-fibrotic and anti-inflammatory properties.

Animal studies further corroborate these findings. Firat et al. (2025) compared colchicine, pirfenidone, and prednisolone in a rat model of urethral mucosal injury and demonstrated that colchicine effectively reduced stricture formation through attenuation of fibrosis and inflammation [11]. These results are consistent with our observed reduction in recurrence from 76% to 42% with colchicine. In a broader review of antifibrotics, Raheem et al. (2018) highlighted the therapeutic potential of agents targeting fibrotic pathways in urological disease, noting that colchicine has one of the most consistent experimental and clinical evidence bases [12].

Alternative anti-fibrotic and anti-inflammatory approaches have also been explored. Gul (2016) proposed that modified platelet-rich plasma with TGF- β 1 neutralization may reduce stricture recurrence, reflecting ongoing interest in biologic modulation of peri-urethral healing [13]. Raheem and Ige (2018) similarly emphasized the need for translational strategies that adapt antifibrotic concepts to urological practice [14]. Beyond strictures, lessons may also be drawn from related fibrotic conditions. For instance, Chernylovskiy et al. (2021) reviewed non-surgical approaches in Peyronie's disease, a condition similarly characterized by aberrant fibrosis, and noted that pharmacological therapies remain an important area of development [15]. Likewise, Sofield et al. (2020) highlighted the importance of early recognition and preservation strategies in penile malignancy, underscoring the principle that conservative and adjunctive measures can improve outcomes in urological disease [16].

Taken together, our findings provide clinical support for colchicine as an effective adjuvant to OIU in reducing stricture recurrence and maintaining urinary flow. The consistency with both experimental and clinical literature underscores its potential as a low-cost, accessible antifibrotic strategy in routine urological practice.

Limitations and Future Directions

This study has several limitations. It was conducted at a single tertiary care centre with a relatively small sample size, which may limit generalizability. Follow-up was restricted to six months, and longer-term outcomes beyond this period remain unknown. Adherence to colchicine was based on patient reporting and not independently verified, introducing potential bias. In addition, colchicine dosing was uniform and not tailored to patient characteristics, leaving unanswered questions about optimal duration or dosage. Future multicentre trials with larger cohorts and extended follow-up are warranted to confirm these findings and to establish standardized protocols for colchicine use in stricture management.

CONCLUSION

Adjunctive oral colchicine after optical internal urethrotomy was associated with significantly lower stricture recurrence and improved urinary flow compared with OIU alone. The beneficial effect persisted after adjustment for stricture length and location, supporting colchicine as an effective antifibrotic therapy in this context. These results add to the growing

evidence base supporting pharmacological modulation of wound healing in urethral stricture disease and suggest that colchicine may represent a practical, low-cost strategy to enhance the durability of endoscopic treatment.

Conflicts of Interest: The authors declare no conflicts of interest.

Funding: Nil

REFERENCES

1. Gupta, S., Roy, S., & Pal, D. K. (2017). Efficacy of oral steroids after optical internal urethrotomy in reducing recurrence of urethral strictures. *Turkish journal of urology*, 44(1), 42.
2. Kurtulus, F. O., & Akgün, F. S. (2018). Long-term effect of colchicine treatment in preventing urethral stricture recurrence after internal urethrotomy. *Urology Journal*, 15(4), 204-208.
3. Issack, F. H., Hassen, S. M., Tefera, A. T., Teshome, H., Gebreselassie, K. H., & Mummed, F. O. (2023). Short-term recurrence rate of male urethral stricture and its predictors after treatment with optical internal urethrotomy: Prospective Cohort Study at a tertiary center in Ethiopia. *Annals of Medicine and Surgery*, 85(10), 4715-4719.
4. Ali, L., Shahzad, M., Orakzai, N., Khan, I., & Ahmad, M. (2015). Efficacy of mitomycin C in reducing recurrence of anterior urethral stricture after internal optical urethrotomy. *Korean journal of urology*, 56(9), 650-655.
5. Ahmad, I., Hilmy, M., Small, D. R., & Conn, I. G. (2007). 37: Is Urethroplasty a Feasible Long-Term Solution for Urethral Stricture?. *The Journal of Urology*, 177(4S), 13-14.
6. DeCastro, B. J., Walter, J. R., McMann, L. P., & Peterson, A. C. (2007). 40: Oral Ketoconazole for Prevention of Postoperative Penile Erection, a Prospective, Randomized, Double Blind, Placebo Controlled Trial. *The Journal of Urology*, 177(4S), 14-15.
7. Acierno, M. J. (2022). Nephrology/urology. In *Clinical Medicine of the Dog and Cat* (pp. 452-503). CRC Press.
8. Shannon, R., & Gornall, P. (2000). Paediatric urology. *Cancer Res*, 60(4030a4032), 4.
9. Course, U. A. I., Canning, D., Grady, R., Reddy, I. P., & Shukla, A. (2014). Scientific Program of USICON 2014. *Indian Journal of Urology*, 30, 1.
10. Luo, H., Lou, K. C., Xie, L. Y., Zeng, F., & Zou, J. R. (2024). Pharmacotherapy of urethral stricture. *Asian Journal of Andrology*, 26(1), 1-9.
11. Firat, F., Yalçın, K., Erdemir, F., & Gevrek, F. (2025). Evaluation of the Efficacy of Colchicine, Pirfenidone and Prednisolone in Preventing Stricture Due to Inflammation as a Result of Urethral Mucosal Damage in Rats. *Journal of Urological Surgery*.
12. Raheem, O. A., Khandwala, Y. S., Hsieh, T. C., & Buckley, J. C. (2018). Is There a Role for Antifibrotics in the Treatment of Urological Disease? A Systematic Review of the Literature. *Urology practice*, 5(1), 31-38.
13. Gul, M. (2016). Modified platelet-rich plasma with transforming growth factor β 1 neutralization antibody injection may reduce recurrence rate of urethral stricture. *Medical Hypotheses*, 97, 1-3.
14. Raheem, A. A., & Ige, A. I. (2018). Author's Accepted Manuscript. *Journal of Building Engineering*.
15. Chernylovskiy, V. A., Krakhotkin, D. V., & Chaikovskiy, V. P. (2021). Non-surgical treatment of Peyronie's disease: a comprehensive review. *Wiad Lek*, 74(3), 539-545.
16. Sofield, D., Siriwardana, A., van den Bos, W., Shnier, R., Stricker, P., Cheung, A. S., ... & Chung, E. Preserving the penis in squamous cell cancer: Early diagnosis and management is key.