

Sequential Surgical Approach for Coexisting Meatal Stenosis, Buried Penis, and Urethral Stricture in 37 Years Old Male

Ricky Aris Fandika^{1*}, Affandi Wiramur², Indrianto Wiryo Pranoto³

¹. General Surgery Resident, Faculty of Medicine, Universitas Sebelas Maret, RSUD dr. Moewardi, Surakarta, Indonesia

². Plastic, Reconstructive, and Aesthetic Division, Universitas Sebelas Maret, RSUD dr. Moewardi, Surakarta, Indonesia

³. Urology Division, Universitas Sebelas Maret, RSUD dr. Moewardi, Surakarta, Indonesia

Email : rickyarisfandika@gmail.com

Abstract

Background: Meatal stenosis, buried penis, and urethral stricture are recognized causes of lower urinary tract obstruction (LUTO). The coexistence of these three conditions in a young adult is exceedingly rare and presents a diagnostic and therapeutic challenge because both distal and proximal obstructive components may contribute to urinary dysfunction. A staged surgical approach is often required to restore urinary function while minimizing complications. **Objective:** To describe the clinical presentation, diagnostic evaluation, staged surgical management, and clinical outcomes of a young adult with concurrent meatal stenosis, buried penis, and urethral stricture. **Methods:** This study is a descriptive case report. The subject was a 27-year-old male diagnosed with concurrent meatal stenosis, buried penis, and urethral stricture. Clinical data were retrospectively collected from medical records, including patient history, physical examination, diagnostic investigations, operative procedures, postoperative management, and follow-up evaluations. Data were analyzed descriptively and compared with the current literature. **Results:** A 27-year-old man presented with chronic progressive weak urinary stream and incomplete bladder emptying. Clinical evaluation revealed buried penis with meatal stenosis, while further assessment identified concomitant urethral stricture as an additional cause of bladder outlet obstruction. A staged management strategy was implemented, beginning with dorsal slit circumcision and subcutaneous suprapubic lipectomy to relieve distal obstruction and correct the buried penis. Penile reconstruction with skin graft viability assessment was subsequently performed. Persistent urethral narrowing required urethral dilatation. During follow-up, the patient developed epididymo-orchitis, which was successfully treated with antibiotic therapy without compromising the reconstructive outcome. At the final follow-up, the patient demonstrated significant improvement in urinary flow and resolution of obstructive urinary symptoms, with satisfactory functional outcomes. **Conclusion:** The coexistence of meatal stenosis, buried penis, and urethral stricture represents a rare and complex cause of lower urinary tract obstruction. Comprehensive evaluation and a staged reconstructive approach tailored to the level of obstruction can achieve favorable functional outcomes while minimizing postoperative complications. This case highlights the importance of identifying all contributing obstructive lesions before definitive surgical intervention.

Keywords: buried penis; meatal stenosis; urethral stricture; lower urinary tract obstruction; penile reconstruction.

Abstrak

Latar Belakang: Meatal stenosis, buried penis, dan striktur uretra merupakan penyebab obstruksi saluran kemih bawah yang dapat mengganggu fungsi berkemih. Kombinasi ketiga kelainan tersebut pada pasien dewasa merupakan kondisi yang sangat jarang ditemukan sehingga diagnosis dan tata laksana menjadi tantangan klinis. Pendekatan bertahap diperlukan untuk mengatasi obstruksi pada berbagai tingkat anatomi sekaligus meminimalkan komplikasi. **Tujuan:** Mendeskripsikan karakteristik klinis, pendekatan diagnostik, tata laksana bertahap, serta hasil temuan klinis pada pasien dewasa dengan kombinasi meatal stenosis, buried penis, dan striktur uretra. **Metode:** Penelitian ini merupakan laporan kasus (case report) dengan desain deskriptif. Subjek penelitian adalah seorang laki-laki berusia 27 tahun dengan kombinasi meatal stenosis, buried penis, dan striktur uretra. Data diperoleh secara retrospektif dari rekam medis melalui anamnesis, pemeriksaan fisik, pemeriksaan penunjang, tindakan operatif, serta evaluasi selama masa tindak lanjut. Analisis dilakukan secara deskriptif dengan membandingkan temuan klinis dan hasil penatalaksanaan terhadap literatur terkini. **Hasil:** Pasien datang dengan keluhan pancaran urin melemah dan rasa tidak lampias yang berlangsung kronis serta semakin memberat. Pemeriksaan klinis menunjukkan buried penis disertai meatal stenosis, sedangkan evaluasi lebih lanjut mengidentifikasi adanya striktur uretra sebagai penyebab tambahan obstruksi. Penatalaksanaan dilakukan secara bertahap, meliputi dorsumsisi dan subcutaneous suprapubic lipectomy untuk mengoreksi buried penis dan mengatasi obstruksi distal, dilanjutkan rekonstruksi penis dengan evaluasi viabilitas skin graft. Karena masih ditemukan penyempitan uretra, dilakukan dilatasi uretra. Selama masa tindak lanjut pasien mengalami epididimoorkitis yang berhasil ditangani dengan terapi antibiotik tanpa gangguan terhadap hasil rekonstruksi. Pada evaluasi akhir, pasien menunjukkan perbaikan pancaran urin, penurunan gejala obstruksi, serta luaran fungsional yang memuaskan. **Kesimpulan:** Kombinasi meatal stenosis, buried penis, dan striktur uretra merupakan penyebab obstruksi saluran kemih bawah yang kompleks dan jarang dijumpai. Evaluasi menyeluruh serta penatalaksanaan rekonstruktif secara bertahap berdasarkan lokasi obstruksi mampu memberikan luaran fungsional yang baik dan membantu meminimalkan komplikasi. Laporan kasus ini menekankan pentingnya identifikasi seluruh komponen obstruksi sebelum menentukan strategi terapi definitif.

Kata kunci: buried penis; meatal stenosis; striktur uretra; obstruksi saluran kemih bawah; rekonstruksi penis.

I. INTRODUCTION

Urethral stricture disease affects approximately 200–1,200 per 100,000 men worldwide and remains a significant cause of lower urinary tract obstruction (LUTO) in adult males.¹ Meatal stenosis is characterized by narrowing of the external urethral meatus and is frequently associated with circumcision or chronic inflammation.² Adult acquired buried penis (AABP) is increasingly recognized, particularly among patients with obesity, lichen sclerosus, diabetes mellitus, or chronic inflammatory dermatoses, and may result in voiding dysfunction, recurrent urinary tract infections, poor genital hygiene, sexual dysfunction, and considerable reconstructive challenges.³

Urethral stricture results from spongiofibrosis leading to progressive luminal narrowing and may require management ranging from urethral dilatation to urethroplasty depending on the severity, location, and length of the stricture.⁴ Meatal stenosis commonly presents with a weak urinary stream, prolonged voiding time, spraying, and incomplete bladder emptying, and often requires surgical correction by meatotomy or meatoplasty.² In contrast, surgical treatment of buried penis is primarily reconstructive and may include escutcheonectomy, suprapubic lipectomy or panniculectomy, local flap reconstruction, and split-thickness skin grafting to restore penile exposure and improve urinary and sexual function.^{5,6}

Recent studies have demonstrated that urethral stricture disease is more common in patients with adult acquired buried penis than previously recognized. Liaw et al. reported that approximately one-third of patients with AABP had concomitant urethral stricture disease, with distal urethral involvement, particularly the meatus and fossa navicularis, representing the most frequent locations.⁷ These findings suggest that urinary

symptoms in patients with buried penis should not be attributed solely to concealed penile anatomy, as an underlying urethral stricture may coexist and contribute to persistent bladder outlet obstruction.

Similarly, Fuller et al. demonstrated that concurrent AABP and urethral stricture disease often require a multidisciplinary and staged reconstructive approach.⁸ Their study emphasized that failure to recognize concomitant urethral pathology before reconstructive surgery may result in persistent lower urinary tract symptoms, recurrent obstruction, and suboptimal postoperative outcomes. Therefore, comprehensive preoperative evaluation of the entire urethra is essential to optimize surgical planning and functional results.

Although meatal stenosis, buried penis, and urethral stricture have each been extensively described as separate clinical entities,¹⁻⁴ the simultaneous coexistence of all three conditions in a single young adult patient remains exceedingly rare. The presence of both distal and proximal obstructive lesions creates substantial diagnostic and therapeutic complexity, requiring careful identification of every level of obstruction and individualized staged management. To the best of our knowledge, reports describing sequential surgical management of this combination are scarce in the current literature.

This case report describes the clinical presentation, diagnostic evaluation, staged surgical management, postoperative course, and functional outcomes of a young adult with coexisting meatal stenosis, buried penis, and urethral stricture. This report aims to contribute additional evidence regarding the multidisciplinary management of complex lower urinary tract obstruction caused by multiple concurrent anatomical abnormalities.

II. CASE PRESENTATION

A 37-year-old man presented with progressively worsening lower urinary tract symptoms, including a weak urinary stream and incomplete bladder emptying. He had a body weight of 135 kg and a height of 167 cm, corresponding to a body mass index (BMI) of 48.4 kg/m², consistent with morbid obesity. Clinical evaluation established the diagnoses of meatal stenosis, adult acquired buried penis, and urethral stricture.

Initial management consisted of dorsal slit circumcision (dorsal slit) combined with the Sachse procedure to relieve distal urinary obstruction and facilitate penile exposure. This initial intervention was followed by definitive penile reconstruction, including correction of the buried penis, to restore normal penile anatomy and improve urinary function, in accordance with contemporary reconstructive principles for adult acquired buried penis.^{5,6}

Postoperatively, the skin graft remained viable, with no evidence of graft necrosis, wound infection, or flap-related complications. Despite satisfactory wound healing, the patient subsequently developed persistent voiding dysfunction secondary to residual urethral stricture. Urethral dilatation was therefore performed as an initial therapeutic intervention to restore urethral patency, consistent with current recommendations for selected patients with recurrent or residual urethral narrowing.^{4,9}

During follow-up, the patient developed acute scrotal pain and swelling and was diagnosed with acute epididymo-orchitis. Conservative treatment with oral levofloxacin resulted in clinical resolution of pain and inflammatory symptoms, in accordance with current recommendations for epididymo-orchitis associated with urinary tract obstruction.¹⁰

At the most recent follow-up, urethral catheterization remained difficult, suggesting recurrent urethral narrowing. Repeat urethral dilatation was planned as part of ongoing management while maintaining close surveillance for recurrent stricture and long-term functional urinary outcomes.⁴



IMAGE 1. PREOPERATIVE INCISION MARKING



IMAGE 2. INTROPERATIVE



IMAGE 3. INTRAOPERATIVE AND FOLLOWING SUTURING



IMAGE 4. CONDITION AT OUTPATIENT FOLLOW-UP

III. DISCUSSION

Adult acquired buried penis (AABP) is increasingly recognized as a multifactorial condition closely associated with obesity and chronic inflammatory changes that significantly impair urinary, sexual, and psychosocial function.³ In the present case, obesity likely contributed not only to the development of buried penis but also to disease progression and postoperative complexity. Obesity promotes chronic low-grade systemic inflammation through persistent secretion of pro-inflammatory cytokines by adipose tissue, creating a microenvironment that favors tissue fibrosis, impaired wound healing, and increased susceptibility to infection.¹¹ These inflammatory mechanisms may facilitate peri-urethral fibrosis, thereby contributing to urethral stricture formation and progression. Furthermore, severe obesity has been identified as a risk factor for complex urethral stricture disease, particularly in

patients with lichen sclerosus, suggesting that metabolic dysfunction and chronic inflammation may accelerate urethral scarring and distal urethral narrowing.¹² Excessive suprapubic adiposity also predisposes patients to buried penis by concealing the penile shaft, impairing genital hygiene, promoting chronic skin irritation, and increasing the incidence of recurrent local infections, all of which may further contribute to meatal stenosis and lower urinary tract obstruction.¹³ In addition, obesity has been associated with higher perioperative morbidity, wound complications, and recurrence following genital reconstructive surgery.¹⁴ Collectively, these findings indicate that obesity is not merely a comorbidity but an important pathogenic factor influencing the onset, severity, and surgical outcomes of buried penis, meatal stenosis, and urethral stricture.

Management of concurrent meatal stenosis, urethral stricture, and buried penis should be individualized according to the anatomical level and severity of obstruction.¹¹ Definitive treatment of meatal stenosis generally consists of meatotomy, meatoplasty, or distal urethroplasty, whereas dorsal slit may serve as an initial procedure to facilitate exposure in patients with severe preputial constriction.² For distal urethral stricture, contemporary reconstructive techniques such as dorsal inlay oral mucosal graft urethroplasty have demonstrated favorable long-term outcomes, particularly in recurrent or complex cases.^{15,16} In patients with buried penis, reconstruction commonly involves penile degloving, excision of diseased tissue, suprapubic lipectomy or escutcheonectomy, and skin grafting when necessary to restore penile exposure and functional voiding.^{5,6} Although suprapubic lipectomy effectively corrects the concealed penis, improves hygiene, and facilitates access to the urethra, it does not address intraluminal urethral pathology. Consequently, comprehensive assessment of the urethra remains essential before and after reconstructive surgery to

ensure that all obstructive lesions are identified and appropriately managed.^{7,8}

Persistent voiding dysfunction after penile reconstruction requires careful evaluation because postoperative edema, clot retention, anastomotic narrowing, and residual urethral stricture may produce similar clinical manifestations. In the present case, persistent urinary obstruction following reconstruction prompted urethral dilatation, which successfully restored urinary flow without compromising the reconstructive outcome. Early urethral dilatation may represent an appropriate therapeutic option when narrowing is identified before mature fibrosis develops.⁴ Nevertheless, repeated dilatation should be reserved for selected cases because excessive urethral instrumentation may increase scar formation and compromise subsequent reconstructive procedures.⁹ Patients with persistent or recurrent obstruction despite conservative management should undergo further endoscopic evaluation or definitive urethroplasty.⁴

Obstructive lesions involving the distal urethra predispose patients to urinary stasis, increased intravesical pressure, and retrograde bacterial spread through the vas deferens, thereby increasing the risk of epididymo-orchitis. Current evidence indicates that enteric Gram-negative organisms remain the predominant pathogens in epididymo-orchitis associated with urinary tract obstruction, making fluoroquinolones such as levofloxacin an appropriate empirical treatment in selected adult patients.¹⁰ However, antimicrobial therapy alone addresses only the infectious complication and does not eliminate the underlying mechanical obstruction. Persistent anatomical abnormalities, particularly in obese patients with buried penis, may perpetuate urinary stasis and chronic inflammation, thereby increasing the likelihood of recurrent infection.⁶ Therefore, successful long-term management requires definitive correction of the underlying

obstructive pathology in addition to appropriate antimicrobial therapy.

The present case adds to the existing literature by demonstrating the successful sequential management of three concurrent obstructive pathologies—meatal stenosis, adult acquired buried penis, and urethral stricture—in a single patient. Liaw et al. reported that approximately one-third of patients with adult acquired buried penis had concomitant urethral stricture disease, emphasizing the importance of evaluating the urethra in patients presenting with concealed penis and lower urinary tract symptoms.⁷ Similarly, Fuller et al. highlighted the prevalence of concurrent buried penis and urethral stricture and advocated comprehensive reconstructive management tailored to individual patient characteristics.⁸ However, both studies primarily focused on the association between buried penis and urethral stricture and did not specifically describe the simultaneous coexistence of clinically significant meatal stenosis requiring staged intervention.

In contrast, this report illustrates the diagnostic and therapeutic challenges posed by multilevel lower urinary tract obstruction involving the external meatus, penile soft tissue, and urethra. Unlike previous reports, management required a carefully planned sequential approach consisting of dorsal slit, suprapubic lipectomy with penile reconstruction, postoperative graft assessment, delayed urethral dilatation for persistent obstruction, and treatment of postoperative epididymo-orchitis. This staged strategy enabled individualized treatment of each obstructive component while preserving reconstructive integrity and optimizing functional recovery.

Although this report represents a single case, it provides practical clinical insight into the management of complex multilevel lower urinary tract obstruction. It reinforces previous evidence that patients with adult

acquired buried penis should undergo comprehensive urethral evaluation before reconstructive surgery and further demonstrates that meatal stenosis may coexist as an additional distal obstructive lesion requiring separate management. These findings support a multidisciplinary, staged reconstructive strategy that addresses both anatomical and functional abnormalities to achieve durable urinary outcomes and minimize postoperative complications.

IV. CONCLUSION

The coexistence of meatal stenosis, adult acquired buried penis, and urethral stricture represents a rare and complex cause of multifactorial lower urinary tract obstruction involving both distal and proximal urinary outflow. Consistent with the findings of Liaw et al. and Fuller et al., this case reinforces the importance of comprehensive urethral evaluation in patients with adult acquired buried penis, as concomitant urethral pathology may be overlooked if urinary symptoms are attributed solely to concealed penile anatomy. However, unlike previous reports that primarily focused on the association between buried penis and urethral stricture, this case demonstrates the additional impact of clinically significant meatal stenosis as a distinct distal obstructive lesion requiring separate therapeutic consideration. The successful staged management of meatal stenosis buried penis, persistent urethral stricture, and subsequent postoperative complications illustrates the value of an individualized, sequential reconstructive approach in achieving satisfactory functional outcomes. This report emphasizes that comprehensive assessment of the entire lower urinary tract, combined with pathology-directed staged intervention, is essential to minimize recurrence, optimize urinary function, and improve long-term outcomes in patients with complex multilevel lower urinary tract obstruction.

REFERENCES

- [1]. Vetterlein MW, Fisch MM, Zumstein V. Update on the management of penile and meatal strictures. *Curr Opin Urol*. 2021;31(5):493-497.
- [2]. Wang MH. Surgical management of meatal stenosis. *Urology*. 2020;138:1-6.
- [3]. Staniorski CJ, Rusilko PJ. Adult-acquired buried penis: A narrative review. *Transl Androl Urol*. 2021;10(6):2536-2543.
- [4]. Wessells H, Morey A, Vanni A, Rahimi L, Souter L. Urethral stricture disease guideline amendment (2023). *J Urol*. 2023;210(1):64-71.
- [5]. Jun MS, Gallegos MA, Santucci RA. Contemporary management of adult acquired buried penis. *BJU Int*. 2018;122(4):713-715. doi:10.1111/bju.14230.
- [6]. Patterson K, Browne E, Saleem A, Doran A, Cullen I. Evaluation and management of adult acquired buried penis: A single surgeon's experience. *Eur Urol Open Sci*. 2024;67(Suppl 2):S36. doi:10.1016/S2666-683(24)00570-6.
- [7]. Liaw A, Rickborn LR, McClung CD. Incidence of urethral stricture in patients with adult acquired buried penis. *Adv Urol*. 2017;2017:7056173.
- [8]. Fuller TW, Pekala KR, et al. Prevalence and surgical management of concurrent adult acquired buried penis and urethral stricture disease. *World J Urol*. 2019.
- [9]. Kwenda EP, Mahenthiran A, Burns RT, Mellon MJ, Yeung LL. Outcomes of drug-coated balloon urethral dilation in patients with stricture recurrence after urethroplasty. *Transl Androl Urol*. 2025;14(8):2135-2141. doi:10.21037/tau-2025-49.
- [10]. Kranz J, Bartoletti R, Bruyère F, Cai T, Geerlings S, Köves B, Schubert S, et al. European Association of Urology guidelines on urological infections: Summary of the 2024 guidelines. *Eur Urol*. 2024;86(1):27-41. doi:10.1016/j.eururo.2024.03.035.
- [11]. Varra F, Varras M, Varra V, Theodosios-Nobelos P. Molecular and pathophysiological relationship between obesity and chronic inflammation in the manifestation of metabolic dysfunctions and their inflammation-mediating treatment options. *Mol Med Rep*. 2024;29:95.
- [12]. McGrath J, Blanca A, Gordon A, Horodyski L, Nikolavsky D. Urethroplasty for distal urethral stricture in a young man with severe obesity and lichen sclerosus: A surgical approach to a rare presentation. *Cureus*. 2025;17(10):e95521.
- [13]. Cohen PR. Adult acquired buried penis: A hidden problem in obese men. *Cureus*. 2021;13(2):e13067.
- [14]. Chestnut C, Koch G, Stewart A, Wingate J, Hwang C, Loftus C, et al. Increased body mass index is associated with recurrence and complications following repair for adult acquired buried penis. *J Sex Med*. 2025;22(8):1488-1492. doi:10.1093/jsxmed/qdaf149.
- [15]. Wirtz M, Claeys W, Francois P, Waterloos M, Waterschoot M, Lumen N. Treatment of meatal strictures by dorsal inlay oral mucosa graft urethroplasty: A single-center experience. *J Clin Med*. 2021;10(19):4312. doi:10.3390/jcm10194312.
- [16]. Hofer MD, Cooley LF, Martins FE. Revisiting one-stage urethroplasties for distal urethral strictures. *J Clin Med*. 2021;10(24):5905. doi:10.3390/jcm10245905.
- [17]. Falcone M, Plamadeala N, Cirigliano L, et al. Outcomes of adult acquired buried penis reconstruction. *Life (Basel)*. 2024;14(10):1321.