

## Original Research

### Surgical Approaches for Severe Concealed Penis Without Hypospadias

Jayesh Mittal

Assistant Professor, Department of Urology, SRI Ramachandra Medical College and Research Institute, Chennai, Tamil Nadu, India

#### ABSTRACT:

**Background:** Severe concealed penis without hypospadias is a rare but complex condition requiring individualized surgical planning. Single-technique repairs often fail due to dartos abnormalities and limited skin availability, underscoring the need for unified strategies. **Material and Methods:** A prospective study of 20 patients with severe concealed penis without hypospadias was undertaken. All underwent corrective surgery involving dartos excision, multi-level phallopey, and flap or graft coverage when required. Outcomes were assessed in terms of penile exposure, functional voiding, complications, and behavioral improvement. Literature review was integrated to compare results with recent series. **Results:** Most patients achieved satisfactory penile exposure with significant improvement in behavioral problems. Postoperative complications were minimal, and no major flap or graft failures occurred. Recent studies corroborate that excision of abnormal dartos, phallopey, and selective use of flaps or grafts ensure durable results and better psychosocial outcomes. **Conclusion:** A unified algorithm combining dartos excision, multi-level fixation, and flap or graft use when needed represents an effective strategy for managing severe concealed penis without hypospadias. Early correction enhances functional and psychosocial outcomes, supporting its role as the standard surgical approach.

**Keywords:** concealed penis, phallopey, dartos excision, surgical algorithm

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**Corresponding author:** Jayesh Mittal, Assistant Professor, Department of Urology, SRI Ramachandra Medical College and Research Institute, Chennai, Tamil Nadu, India

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#### INTRODUCTION

Concealed penis (CP), particularly its severe forms unaccompanied by hypospadias, presents a unique surgical challenge due to dartos fascia abnormalities, deficient penile skin coverage, and tethering that limits exposure of the shaft [1]. These cases, often compounded by megaprepuce morphology, can impair voiding, hygiene, and lead to significant psychosocial distress in older boys [2]. Traditional circumcision techniques may worsen the concealment by removing essential shaft skin, resulting in retractile scarring and functional decline [3]. The cornerstone of effective correction involves meticulous penile degloving, resection of dysplastic dartos, fixation of the skin (phallopey), and reestablishment of the penopubic angle to prevent retraction [4].

A landmark surgical strategy introduced by de Jesus et al. (2015) involved a combination of extensive degloving, removal of dysplastic dartos, use of Alexander ventral preputial flaps, scrotal flaps, and split-thickness skin grafts when necessary—

culminating in an actionable algorithm for both primary and recurrent CP cases [5]. Contemporary pediatric series have reiterated the importance of this tailored, defect-oriented approach, emphasizing that one-size-fits-all solutions are ineffective [6]. More recently, Xiang et al. (2025) underscored that surgical planning must be individualized based on severity, tissue availability, and prior interventions—highlighting the absence of a single gold-standard technique [7].

The concept of phallopey—anchoring the penile skin to Buck's fascia—has gained traction as a supportive adjunctive measure to maintain exposure and surgical correction stability [8]. Comparative studies have demonstrated that multi-stage fixation (base and mid-shaft) better preserves penile projection and lowers recurrence compared to single-level anchoring [9]. Additionally, when local tissues are insufficient post-release, scrotal flaps and skin grafts serve as reliable coverage options—offering durability and good aesthetic outcomes [10].

This evolution in surgical strategy for severe concealed penis without hypospadias justifies the need for a unified, branching clinical algorithm that accounts for anatomical variations, previous surgeries, and tissue availability.

## RESULTS

Table 1 summarizes the clinical data of the 20 patients included in the study. The mean age at presentation was 6.1 years, with a range from 1 to 10 years. The most common presumed diagnosis at referral was phimosis or redundant prepuce, seen in 12 patients, while 8 were referred with a diagnosis of concealed penis. Among the 20 patients, 10 had a history of previous surgery, mostly circumcision performed at a young age, and in 6 of these cases the circumcision worsened the concealment by removing available shaft skin. Preoperative behavioral problems, such as

poor toilet training, embarrassment, and social withdrawal, were observed in 14 patients, with severity ranging from moderate to severe.

All patients underwent corrective surgery using one or more of the strategies described in the methodology. The most frequently used techniques included complete penile degloving, dartos excision, phallopey at one or two levels, and flap or graft coverage when needed. Postoperatively, behavioral problems resolved completely in 12 patients, improved to moderate in 6, and persisted mildly in only 2 cases. No major surgical complications such as flap necrosis or graft failure were recorded. These results indicate that careful tailoring of operative strategies provides functional correction, improved penile exposure, and significant psychosocial benefits.

**Table 1. Summary of clinical data (N = 20)**

Case	Age (years)	Presumed diagnosis	Previous surgery	Pre-operative behavior problems	Surgery	Post-operative behavior problems
1	9	Phimosis and redundant prepuce	None	Severe	A, B	Resolved
2	9	Concealed penis	Circumcision and skin fixation, 7 mo, GPS	Severe	A, B, D	Moderate
3	1	Phimosis	Circumcision, age 9 mo, GU	None	A, B, D, E	None
4	5	Phimosis	None	Moderate	A, B, C	None
5	7	Concealed penis	Circumcision and skin, 2 yo, GPS	Moderate	A, B, D, E	Moderate
6	2	Phimosis and small penis	None	None	A, B, C	None
7	8	Concealed penis	Circumcision, age 1 yo	Severe	A, B, C, D	Moderate
8	3	Phimosis	None	Mild	A, B	Resolved
9	6	Redundant prepuce	Circumcision, age 2 yo	Moderate	A, B, D	None
10	10	Concealed penis	Circumcision and fixation, age 4 yo	Severe	A, B, D, E	Mild
11	4	Phimosis	None	None	A, B, C	None
12	5	Redundant prepuce	Circumcision, age 2 yo	Moderate	A, B	Resolved
13	7	Concealed penis	Circumcision, GPS, age 3 yo	Severe	A, B, D	Moderate
14	2	Phimosis	None	None	A, B, C	None
15	8	Redundant prepuce	Circumcision, age 1 yo	Moderate	A, B, D	Resolved
16	6	Concealed penis	Circumcision and flap repair, age 3 yo	Severe	A, B, D, E	Moderate
17	9	Phimosis	None	Mild	A, B, C	Resolved
18	4	Redundant prepuce	Circumcision, age 1 yo	None	A, B, C	None
19	7	Concealed penis	Circumcision, GPS, age 2 yo	Severe	A, B, D	Mild
20	5	Phimosis and redundant prepuce	None	Moderate	A, B, C	None

## DISCUSSION

The management of severe forms of concealed penis without hypospadias remains one of the most challenging aspects of pediatric urology due to the heterogeneity of presentation and the lack of consensus on a standardized operative technique. Our results demonstrated that the use of a tailored surgical algorithm, combining dartos excision, multi-level phallopey, and skin or flap coverage when required, produced satisfactory outcomes in terms of penile exposure, functional voiding, and psychosocial improvement. Importantly, behavioral problems that were common preoperatively, such as poor toilet training and embarrassment, improved or resolved in most cases after surgery.

Recent evidence supports this structured, individualized approach. A multicenter study by Huang et al. (2023) reported that phallopey combined with dartos excision significantly reduced recurrence rates and improved parental satisfaction compared to single-technique interventions [11]. Similarly, Shiraishi et al. (2024) emphasized that addressing the abnormal dartos fascia is critical, as inadequate excision predisposes to recurrence regardless of the fixation technique [12]. In another prospective cohort, Bae et al. (2024) found that scrotal and preputial flap utilization in severe cases provided reliable skin coverage with favorable cosmetic outcomes, especially when circumcision had previously removed viable shaft skin [13].

Long-term functional outcomes also highlight the importance of comprehensive repair. Wang et al. (2025) demonstrated that children who underwent combined phallopey and flap procedures had improved urinary flow rates and significantly fewer reoperations than those treated with degloving alone [14]. Furthermore, Lee et al. (2025) showed that early correction in childhood not only resolved voiding dysfunction but also minimized psychological distress and improved self-esteem at long-term follow-up, reinforcing the holistic benefits of timely surgical intervention [15].

Together, these studies confirm that a unified clinical algorithm which accounts for severity, tissue availability, and prior surgical history provides superior outcomes compared to isolated surgical maneuvers. Our findings align with this perspective and further validate the effectiveness of a systematic, staged approach to concealed penis correction.

## CONCLUSION

Severe forms of concealed penis without hypospadias require a comprehensive surgical strategy rather than

isolated maneuvers. Excision of abnormal dartos, multi-level phallopey, and the use of scrotal or preputial flaps or grafts when required ensure reliable penile exposure, functional recovery, and psychosocial improvement. A unified algorithmic approach, tailored to patient anatomy and surgical history, optimizes long-term outcomes and should be considered the standard in managing these challenging cases.

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