

Bladder Exstrophy: A Case Report at Abass Ndao Hospital Center

Yves Kyungu Nkulu*, Idrissa Ngom, Pereira Ermelindo, Ibou Dieng, Arsen Mudiangombe Ngoie, Arsène Mponyongo, Tony Kabangu, Yannick Kabeya Tshiani

Urology-Andrology Department, Abass Ndao Hospital Center, Dakar, Senegal

Email: *yveskyungu@gmail.com

How to cite this paper: Kyungu Nkulu, Y., Ngom, I., Ermelindo, P., Dieng, I., Ngoie, A.M., Mponyongo, A., Kabangu, T. and Tshiani, Y.K. (2026) Bladder Exstrophy: A Case Report at Abass Ndao Hospital Center. *Open Journal of Urology*, 16, 489-498. <https://doi.org/10.4236/oju.2026.1610049>

Received: June 4, 2026

Accepted: October 24, 2026

Published: October 27, 2026

Copyright © 2026 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Bladder exstrophy is a rare and severe congenital malformation belonging to the exstrophy-epispadias complex. It can be diagnosed prenatally using morphological ultrasound, but in resource-limited countries, it is often diagnosed at birth due to insufficient access to specialized obstetric care. We report the case of a 7-year-old girl with bladder exstrophy diagnosed at birth but treated late in our department, in order to highlight the difficulties in accessing specialized care in our setting and to discuss the diagnostic, therapeutic, and prognostic challenges of this rare malformation.

Keywords

Bladder Exstrophy, Bladder Reconstruction, Urological Malformation, Senegal

1. Introduction

Bladder exstrophy is a rare and severe congenital malformation belonging to the exstrophy-epispadias complex. It is characterized by a failure of closure of the infraumbilical abdominal wall and the anterior wall of the bladder, associated with anomalies of the urethra, pelvic girdle, external genitalia, and perineum [1]. Its incidence is estimated to be between 1/30,000 and 1/50,000 live births, with a male predominance, the sex ratio varying from 2 to 3 boys to one girl [2] [3].

The diagnosis is most often established prenatally using morphological ultrasound. Suggestive signs can be identified as early as the first trimester of pregnancy, around 11 weeks of amenorrhea, primarily the persistent non-visualization of the fetal bladder, observed in nearly 80% of cases [2]. In the second trimester, the absence of bladder visualization, which should normally be identifiable from 16 weeks of gestation regardless of its state of fullness, constitutes a major warning

sign. Other associated anomalies can also guide the diagnosis, including a subumbilical mass, a low-lying umbilical cord, or diastasis of the pubic bones.

Despite advances in prenatal imaging, some cases are still diagnosed only in the early postnatal period, or even, exceptionally, in adulthood [1]. In resource-limited countries, prenatal diagnosis remains insufficient due to limited access to specialized obstetric care and high-quality morphological ultrasound. Furthermore, some newborns diagnosed at birth are not referred to specialized centers due to a lack of information among families, difficulties in navigating the healthcare system, or socioeconomic and financial constraints [4]. These diagnostic and therapeutic delays can worsen the functional and psychological prognosis of patients.

The management of bladder exstrophy is primarily surgical and ideally begins in the neonatal period. Early closure of the bladder and abdominal wall promotes bladder development, improves the chances of achieving satisfactory urinary continence, and helps preserve long-term renal function [5] [6].

We report the case of a 7-year-old girl with bladder exstrophy diagnosed at birth but treated belatedly in our department in February 2024 to highlight the challenges of accessing specialized care in our setting and to discuss the diagnostic, therapeutic, and prognostic aspects of this rare malformation.

2. Clinical Observation

The patient was a 7-year-old girl, not attending school, brought in by her parents due to an uncovered hypogastric mass associated with continuous urinary leakage present since birth.

The child had been born in a public hospital where a diagnosis of bladder exstrophy was made at birth, though no appropriate treatment was administered. Surgical management had been delayed due to financial constraints. Perinatal history indicated irregular prenatal care with no antenatal diagnosis having been established.

Clinical and paraclinical examinations performed in August 2023 showed the child to be in good general health, with normal height-weight and psychomotor development. Abdominal examination revealed a reddish, ovoid mass measuring approximately 10 cm by 7 cm, corresponding to the exposed bladder plate. Ureteral orifices were visible at the upper part of the plate, with continuous urine flow. The abdominal wall surrounding the exstrophy plate was supple, with no signs of local infectious complications.

Examination of the external genitalia revealed a malformed vulva with a bifid clitoris, presenting as two hemi-clitorides. The labia majora and minora were difficult to distinguish from one another. A small, midline, depressed opening corresponding to the vaginal orifice was identified (**Figure 1**).

The Urinary CT scan revealed bladder exstrophy associated with a 56 mm dehiscence of the infra-umbilical anterior abdominal wall muscles, as well as an uncomplicated abdominal wall hernia containing bowel. Diastasis of the pubic symphysis measuring 83.7 mm was also noted (**Figure 2**). Furthermore, the examina-

tion showed good opacification of the kidneys, pelvicalyceal systems, and ureters, with no morphological abnormalities or obstruction of the upper urinary tract (**Figure 3**).

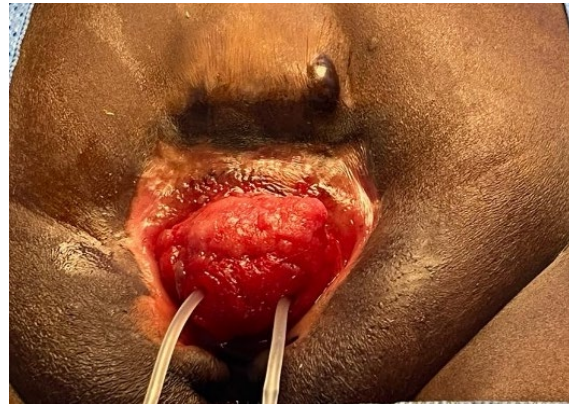


Figure 1. Preoperative clinical appearance of bladder exstrophy.



Figure 2. Axial section of the uro-scan.



Figure 3. Reconstruction image of the upper urinary tract supérieure.

Laboratory tests performed upon admission showed a serum creatinine level of 7 mg/L. Urine culture and microscopic analysis revealed no pathogens.

Initial surgical treatment consisted of primary closure of the bladder plate following dissection of its edges, with bladder suturing over a 12 Fr indwelling urinary catheter. Abdominal wall reconstruction was performed during the same procedure by closing the aponeurosis, followed by skin closure using interrupted sutures (**Figure 4**). No bladder neck reconstruction to improve continence or pelvic osteotomy was performed during this initial intervention.

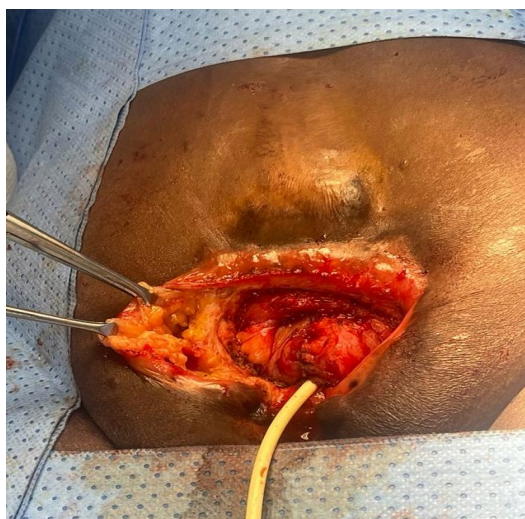


Figure 4. Intraoperative view after dissection of the bladder exstrophy plaque.

The postoperative course was uneventful, with no wound infections or impairment of renal function. At one month postoperatively, serum creatinine levels were within normal limits, allowing for the removal of the urinary catheter.

At the six-month follow-up, the child showed good healing of the abdominal wall (**Figure 5**). However, total urinary incontinence persisted, with no return of voluntary voiding, necessitating the continuous use of absorbent pads. At 27 months of follow-up, no improvement in urinary function was observed; the child continues to experience urinary incontinence without the resumption of voluntary voiding. Restoring urinary continence remains a major therapeutic challenge and will require additional reconstructive procedures during the course of follow-up.

3. Discussion

Bladder exstrophy is a rare congenital malformation. Its incidence is estimated at between 1 in 30,000 and 1 in 50,000 live births, depending on the study series, with a male predominance [7].

Diagnosis of bladder exstrophy relies primarily on the morphological obstetric ultrasound performed during pregnancy. This examination is now the cornerstone

of prenatal screening for the condition and enables appropriate neonatal management [2] [7].



Figure 5. Postoperative appearance after abdominal wall reconstruction.

The diagnostic performance of prenatal ultrasound has improved significantly over recent decades. Hirsch *et al.* report a sensitivity of up to 82.8% when characteristic ultrasound signs are systematically sought [8].

Despite these capabilities, prenatal diagnosis remains inadequate in many resource-limited countries. Several factors contribute to this situation, notably limited access to specialized morphological ultrasound, insufficient prenatal care, and a lack of awareness regarding the ultrasound signs of this rare condition. For instance, Siffel *et al.* report that although diagnosis is possible during the fetal period, it is still frequently made only at birth [9].

More rarely, very late diagnoses have been described in adolescence or adulthood [10]. Notably, Traore *et al.* reported cases diagnosed in patients aged 24, 25, and 28 [4]. Such diagnostic delays are generally observed in disadvantaged socioeconomic settings characterized by limited access to healthcare facilities, inadequate prenatal care, a lack of obstetric ultrasound, and sometimes home births [11].

In our case, the diagnosis was established at birth in a hospital setting. However, no prenatal diagnosis had been made due to irregular prenatal care. Furthermore, surgical intervention was delayed until the age of seven due to financial constraints. This situation illustrates the persistent challenges facing healthcare systems in resource-limited settings, where access to specialized prenatal diagnosis and reconstructive care remains inadequate. It also highlights the importance of strengthening prenatal screening and improving access to specialized care to optimize the functional and psychosocial outcomes for children with bladder exstrophy.

Fetal Magnetic Resonance Imaging (MRI) plays a complementary role in the prenatal diagnosis of bladder exstrophy. Although obstetric ultrasound remains the gold standard for initial screening, MRI may be indicated when ultrasound findings are equivocal or when anatomical assessment is limited by technical fac-

tors such as maternal obesity, oligohydramnios, or unfavorable fetal positioning [12] [13].

According to Hsieh *et al.* [14], MRI performed around 32 weeks of gestation is the preferred imaging modality for the precise characterization of severe urogenital malformations.

In our case, MRI was not performed; instead, a CT scan (uro-CT) allowed for the precise assessment of the abdominal wall defect and pubic diastasis, providing the anatomical information necessary for surgical planning.

CT scanning is a useful complementary tool for the anatomical assessment of bladder exstrophy, particularly in cases diagnosed late. Although not indicated as a first-line diagnostic tool for this malformation, it enables precise analysis of associated abdominal wall, skeletal, and pelvic abnormalities. Through multiplanar and three-dimensional reconstructions, CT scanning accurately evaluates the extent of the anterior abdominal wall defect, the severity of the pubic diastasis, and the anatomical relationships of pelvic structures.

The treatment of bladder exstrophy relies primarily on reconstructive surgery. The main objectives are closure of the bladder and abdominal wall, preservation of upper urinary tract function, achievement of satisfactory urinary continence, and reconstruction of the external genitalia to enable harmonious psychosexual development [15] [16].

Ideally, management is carried out during the neonatal period at a specialized center. While early primary closure remains widely practiced, several teams now favor scheduled closure within the first few weeks of life; this allows for better preparation of both the patient and the multidisciplinary team while still yielding excellent anatomical and functional outcomes [16].

Two main surgical strategies are described: Complete Primary Repair of Exstrophy (CPRE), performed in a single operation [17], and the classic multi-stage reconstruction, which combines initial bladder closure and epispadias repair with subsequent bladder neck surgery once bladder capacity is sufficient [18]. The choice of technique depends on the patient's age, the surgical team's experience, and the anatomical characteristics of the malformation [16] [19] [20].

Despite advances in reconstructive surgery, achieving complete urinary continence remains a major therapeutic challenge [15] [21]. Some patients require additional procedures, such as bladder neck reconstruction, augmentation cystoplasty, or the creation of a continent conduit. Long-term follow-up is essential to monitor renal function, urinary continence, and recurrent urinary tract infections, as well as aesthetic and psychosexual outcomes [15] [22]-[24].

In our case, closure of the bladder plate combined with abdominal wall reconstruction achieved satisfactory anatomical correction, with an uncomplicated post-operative course and good wound healing. However, as seen in many published series, restoring urinary continence remains the primary therapeutic challenge and may require additional reconstructive procedures during follow-up.

The delay in treatment observed in our case could compromise optimal bladder

development and reduce the likelihood of achieving satisfactory urinary continence compared to patients who undergo surgical correction during the neonatal period [5]. Indeed, early management promotes better bladder growth and optimizes long-term functional outcomes. Reported continence rates following bladder exstrophy reconstruction generally range from 60% to 90% [16] [21], depending on the surgical strategy employed, the patient's age at the time of surgery, anatomical characteristics, and the potential need for additional reconstructive procedures.

Beyond the anatomical and functional consequences, bladder exstrophy exposes children to challenges regarding social integration, altered body image, significant psychological impact, and an increased risk of dropping out of school—particularly when treatment is delayed. In resource-limited settings, these repercussions are often exacerbated by difficulties accessing specialized care, the high cost of reconstructive surgery, and the lack of multidisciplinary follow-up involving pediatric surgeons, urologists, orthopedists, psychologists, and rehabilitation specialists. Our case report illustrates this reality: although the diagnosis was made at birth, socioeconomic constraints led to a seven-year delay in treatment, which may have compromised the bladder's functional development and prospects for urinary continence.

This case also demonstrates that satisfactory anatomical closure can be achieved in a child treated late, with good abdominal wall healing and preservation of renal function [25]. However, as reported in most case series, anatomical reconstruction does not guarantee the restoration of bladder-sphincter function [25]. After 27 months of follow-up, our patient continues to experience urinary incontinence without the return of voluntary voiding, confirming that urinary continence remains the most difficult therapeutic goal to achieve. Further reconstructive treatment will be required to improve functional outcomes.

However, our study has several limitations. First, it is a single-case report, which precludes generalizing the results to all patients with bladder exstrophy. Nevertheless, the rarity of this malformation and the exceptional nature of such delayed management in our setting make this case particularly noteworthy. Second, although the 27-month postoperative follow-up provides a longer observation period than that reported in many other case studies, it remains insufficient to assess long-term outcomes specifically regarding definitive urinary continence, bladder growth and capacity, quality of life, long-term renal function, as well as psychosexual consequences and potential late complications. Finally, the chosen therapeutic strategy—consisting of bladder plate closure and abdominal wall reconstruction without pelvic osteotomy or bladder neck reconstruction does not allow for an evaluation of the impact of these additional procedures on functional outcomes. Multicenter studies involving larger patient cohorts and follow-up extending into adolescence and adulthood are needed to better define optimal management strategies for late-diagnosed bladder exstrophy in resource-limited settings.

4. Conclusions

Bladder exstrophy is a rare and complex congenital malformation usually diagnosed prenatally or at birth. Despite advances in prenatal screening and reconstructive surgery, delays in treatment persist in resource-limited countries due to socio-economic constraints and insufficient access to specialized care.

Improving the prognosis of bladder exstrophy relies on strengthening prenatal diagnosis, early referral to specialized centers, and multidisciplinary care from the neonatal period onward to optimize functional, aesthetic, and psychosocial outcomes.

Author Contributions

The authors contributed to this work according to their respective roles. Their contributions included the conception of the article, the collection and analysis of clinical data, the literature search, the interpretation of results, the drafting of the initial manuscript, critical revision, and the incorporation of corrections. Some authors also participated in data collection and the literature review. All authors have approved the final version of the manuscript and agree to take responsibility for it.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Dembele, A. (2018) Exstrophie Vesicale: À Propos d'un cas diagnostique tardivement chez une femme enceinte. *Journal de la SAGO (Gynécologie—Obstétrique et Santé de la Reproduction)*, **19**, 1.
- [2] Furtos, C., Chene, G., Varlet, M.N., Varlet, F., Seffert, P. and Chauleur, C. (2010) Diagnostic anténatal et prise en charge des extrophies vésicales isolées. *Gynécologie Obstétrique & Fertilité*, **38**, 624-630. <https://doi.org/10.1016/j.gyobfe.2010.08.027>
- [3] El Khader, K., El Fassi, J., Koutani, A., Ibn Attya, A., Hachimi, M. and Lakrissa, A. (2003) Aspects psychologiques, sexuels et sociaux de l'exstrophie vésicale chez l'adulte. Analyse de 3 cas. *Annales d'Urologie*, **37**, 113-116. [https://doi.org/10.1016/s0003-4401\(03\)00044-5](https://doi.org/10.1016/s0003-4401(03)00044-5)
- [4] Traore, M.T., Niang, L., Jalloh, M., Ndow, M., Labou, I. and Gueye, S.M. (2016) À "Prise en charge de l'exstrophie vésicale À propos de 7 cas À l'hôpital général du grand Yoff au Sénégal À". *Uro-Andro: Revue d'Urologie et d'Andrologie de l'ASU*, **1**, 247-250. <https://revue-uroandro.org/index.php/uro-andro/article/view/35>
- [5] Grady, R.W. and Mitchell, M.E. (1999) Complete Primary Repair of Exstrophy. *Journal of Urology*, **162**, 1415-1420. [https://doi.org/10.1016/s0022-5347\(05\)68327-9](https://doi.org/10.1016/s0022-5347(05)68327-9)
- [6] Gearhart, J.P. and Mathews, R. (1999) The Exstrophy-Epispadias Complex: Research Concepts and Clinical Applications. Springer US.
- [7] Ebert, A.K., Reutter, H., Ludwig, M. and Rösch, W.H. (2009) The Exstrophy-Epispadias Complex. *Orphanet Journal of Rare Diseases*, **4**, Article No. 23. <https://doi.org/10.1186/1750-1172-4-23>
- [8] Hirsch, A.M., Morrill, C.C., Haffar, A., Harris, T.G.W., Crigger, C., Jelin, A.C., *et al.*

- (2024) Optimizing Prenatal Diagnosis and Referral of Classic Bladder Exstrophy: Lessons from a Single-Institution Experience. *Journal of Pediatric Urology*, **20**, 619-627. <https://doi.org/10.1016/j.jpuro.2024.02.014>
- [9] Siffel, C., Correa, A., Amar, E., Bakker, M.K., Bermejo-Sánchez, E., Bianca, S., *et al.* (2011) Bladder Exstrophy: An Epidemiologic Study from the International Clearinghouse for Birth Defects Surveillance and Research, and an Overview of the Literature. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*, **157**, 321-332. <https://doi.org/10.1002/ajmg.c.30316>
- [10] Nerli, R., Kamat, G., Alur, S., Koura, A., Prabha, V. and Amarkhed, S. (2008) Bladder Exstrophy in Adulthood. *Indian Journal of Urology*, **24**, Article No. 164. <https://doi.org/10.4103/0970-1591.40609>
- [11] Tshimbayi, M., Ndua, D., Kazadi, C., Bugeme, M., Mubinda, P.K., Kwete, L.S., *et al.* (2014) Exstrophie vésicale: À propos d'un cas diagnostiqué tardivement. *Pan African Medical Journal*, **17**, Article No. 172. <https://doi.org/10.11604/pamj.2014.17.172.3031>
- [12] Goldman, S., Szejnfeld, P.O., Rondon, A., Francisco, V.V., Bacelar, H., Leslie, B., *et al.* (2013) Prenatal Diagnosis of Bladder Exstrophy by Fetal MRI. *Journal of Pediatric Urology*, **9**, 3-6. <https://doi.org/10.1016/j.jpuro.2012.06.018>
- [13] Ostertag-Hill, C.A., Delaplain, P.T., Lee, T. and Dickie, B.H. (2024) Updates on the Care of Cloacal Exstrophy. *Children*, **11**, Article No. 544. <https://doi.org/10.3390/children11050544>
- [14] Hsieh, K., O'Loughlin, M.T. and Ferrer, F.A. (2005) Bladder Exstrophy and Phenotypic Gender Determination on Fetal Magnetic Resonance Imaging. *Urology*, **65**, 998-999. <https://doi.org/10.1016/j.urology.2004.12.060>
- [15] Gearhart, J.P., Mathews, R., Taylor, S. and Jeffs, R.D. (1998) Combined Bladder Closure and Epispadias Repair in the Reconstruction of Bladder Exstrophy. *Journal of Urology*, **160**, 1182-1185.
- [16] Morrill, C.C., Haffar, A., Harris, T.G.W., Crigger, C. and Gearhart, J.P. (2023) Current Management of Classic Bladder Exstrophy in the Modern Era. *African Journal of Urology*, **29**, Article No. 27. <https://doi.org/10.1186/s12301-023-00356-4>
- [17] Grady, R.W., Carr, M.C. and Mitchell, M.E. (1999) Complete Primary Closure of Bladder Exstrophy: Epispadias and Bladder Exstrophy Repair. *Urologic Clinics of North America*, **26**, 95-109. [https://doi.org/10.1016/s0094-0143\(99\)80009-3](https://doi.org/10.1016/s0094-0143(99)80009-3)
- [18] Wilcox, D.T. and Chitty, L.S. (2001) Non-Visualisations of the Fetal Bladder: Aetiology and Management. *Prenatal Diagnosis*, **21**, 977-983.
- [19] Anand, S. and Lotfollahzadeh, S. (2023) Bladder Exstrophy. StatPearls Publishing.
- [20] Promm, M. and Roesch, W.H. (2019) Recent Trends in the Management of Bladder Exstrophy: The Gordian Knot Has Not Yet Been Cut. *Frontiers in Pediatrics*, **7**, Article 110. <https://doi.org/10.3389/fped.2019.00110>
- [21] Harris, K.T., Namdarian, B., Gearhart, J.P. and Wood, D. (2024) Long Term Outcomes in Classic Bladder Exstrophy—The Adult Picture. *Journal of Pediatric Urology*, **20**, 157-164. <https://doi.org/10.1016/j.jpuro.2023.06.028>
- [22] Mahajan, J. and Rao, K.N. (2012) Exstrophy Epispadias Complex—Issues beyond the Initial Repair. *Indian Journal of Urology*, **28**, Article No. 382. <https://doi.org/10.4103/0970-1591.105747>
- [23] Schaeffer, A.J., Stec, A.A., Baradaran, N., Gearhart, J.P. and Mathews, R.I. (2013) Preservation of Renal Function in the Modern Staged Repair of Classic Bladder Exstrophy. *Journal of Pediatric Urology*, **9**, 169-173. <https://doi.org/10.1016/j.jpuro.2012.01.014>

- [24] Bazinet, A., Filfilan, A., Mokhtari, N., Lenfant, L., Elghoneimi, A. and Chartier-Kastler, E. (2024) Adult Patients Treated for Bladder Exstrophy at a Young Age. *Canadian Urological Association Journal*, **18**, E187-E193. <https://doi.org/10.5489/cuaj.8601>
- [25] Weiss, D.A., Groth, T.W., Abdulfattah, S.A., Eftekharzadeh, S., Lee, T., Lee, R., *et al.* (2024) Multi-Institutional Bladder Exstrophy Consortium after 8 Years: The Short- and Intermediate-Term Outcomes. *Journal of Urology*, **212**, 177-184. <https://doi.org/10.1097/ju.0000000000003971>