

# Bladder Exstrophy: Etiology and Treatment

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## Abstract

Bladder exstrophy is a rare congenital anomaly characterized by protrusion of the urinary bladder through a defect in the lower abdominal wall. Its management is challenging and requires multi-stage reconstructive surgery, long-term follow-up, and multidisciplinary care. In this article, we review the epidemiology, embryology, clinical features, surgical strategies, outcomes, and present a case of delayed presentation in adolescence.

**Keywords:** bladder exstrophy, reconstructive urology, pediatric surgery, continence, long-term outcomes.

## Introduction

Bladder exstrophy (BE) is part of the exstrophy-epispadias complex and is characterized by eversion of the bladder mucosa through a defect in the abdominal wall. The estimated prevalence is about 2.0 to 3.3 per 100,000 live births. It is more common in males than females. Because of its complexity, treatment involves staged reconstructive surgery, with the goals of urinary continence, preservation of renal function, and acceptable cosmesis.

## Embryology and Etiology

The precise cause remains unclear, but theories involve abnormal development of the cloacal membrane and mesenchymal defects preventing proper closure of the lower abdominal wall. Genetic factors (e.g., Wnt, BMP4, Alx4, ISL1 pathways) and environmental factors (maternal smoking, older maternal age, exposure to valproic acid) may contribute.

## Epidemiology

Bladder exstrophy prevalence is estimated at 2–3 per 100,000 live births, with a male-to-female ratio of approximately 2:1. The condition occurs globally without strong geographic clustering.

## Clinical Features and Diagnosis

At birth, the bladder plate is exposed on the abdominal wall with pubic diastasis and abnormal genitourinary anatomy. Associated anomalies include epispadias, pelvic deformities, and reproductive tract abnormalities. Prenatal diagnosis is sometimes possible via ultrasound. Postnatal imaging (ultrasound, VCUG, MRI) aids surgical planning.

## Management / Surgical Treatment

The goals of treatment include primary bladder closure, bladder neck reconstruction, and long-term follow-up.

1. Primary closure: performed soon after birth to preserve bladder capacity and minimize fibrosis.
2. Bladder neck reconstruction: performed later to achieve continence, sometimes with bladder augmentation.
3. Long-term follow-up: monitoring for infections, reflux, stones, and renal function.

## Outcomes and Challenges

Initial closure success is critical for continence. Long-term issues include urinary incontinence, stones, infections, and psychosocial impact. With proper multidisciplinary care, many patients achieve good renal function and acceptable quality of life.

## Case Report Example

A 15-year-old male presented with lifelong urinary incontinence and exposed bladder plate. Imaging showed preserved kidneys and pubic diastasis. Surgery involved staged closure and augmentation. At 1-year follow-up, continence improved with intermittent catheterization. Outcome was satisfactory with occasional infections.

## Discussion

Delayed presentation increases surgical complexity due to fibrosis and psychological factors. Modern reconstructive approaches, including staged closure and augmentation, can still yield functional outcomes. Long-term multidisciplinary follow-up is essential.

## Conclusion

Bladder exstrophy is a rare but surgically correctable anomaly requiring lifelong care. Early intervention improves outcomes, but even late cases can benefit from individualized reconstructive approaches.

## References

1. Толибов, Ф. (2024). ИММУННАЯ СИСТЕМА: АНАТОМИЯ ЛИМФАТИЧЕСКОЙ СИСТЕМЫ И МЕХАНИЗМЫ ИММУННОГО ОТВЕТА. Журнал академических исследований нового Узбекистана, 1(2), 55-58.
2. Farxodivich, T. F. (2024). The Syndrome of External Secretory Function Insufficiency is a Common Complication of Chronic Pancreatitis. American Journal of Bioscience and Clinical Integrity 1 (10), 90-95
3. Farxodivich, T. F. (2024). Clinical Characteristics of Gastritis in Digestive Diseases. Research Journal of Trauma and Disability Studies, 3(3), 294-299.
4. Farxodivich, T. F. (2024). INFECTION OF COVID-19 ON COGNITIVE FUNCTIONS. SCIENTIFIC JOURNAL OF APPLIED AND MEDICAL SCIENCES, 3(4), 325-330.
5. Tolibov F.F. - VIOLATION OF PLATELET AGGREGATION AND IMBALANCE OF HEMOSTASIS IN PATIENTS WITH CHRONIC VIRAL HEPATITIS C//New Day in Medicine 6(68)2024 264-268 <https://newdayworldmedicine.com/en/article/3758>
6. o'g'li, K. S. M. (2025). LUMBAR DISC HERNIATION: PATHOGENESIS, DIAGNOSIS, AND MODERN TREATMENT APPROACHES. International Journal of Cognitive Neuroscience and Psychology, 3(9), 33–38.
7. Jabborov Sherbek Otabek o'g'li. (2025). GASTRITS: ETIOLOGY AND TREATMENT. <https://doi.org/10.5281/zenodo.15070415>
8. Vali o'g'li, M. S. (2024). KIDNEY CANCER: EPIDEMIOLOGY AND
9. TREATMENT. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 4(11), 459–463.
10. Vali o'g'li, M. S. KIDNEY CANCER: EPIDEMIOLOGY AND TREATMENT.

11. Valiyevich, M. S. (2024). Specific Morphofunctional Characteristics of the Kidney Caused by Brain Damage in Various Emergency Situations. *Research Journal of Trauma and Disability Studies*, 3(4), 286-289
12. Ergasheva, G. (2025). POLYCYSTIC OVARY SYNDROME: A COMPREHENSIVE OVERVIEW AND CURRENT TREATMENT APPROACHES. *Modern Science and Research*, 4(4), 937-944.
13. Ergasheva, G. (2025). ACROMEGALY: A SEVERE NEUROENDOCRINE DISORDER WITH MULTISYSTEM MANIFESTATIONS. *Modern Science and Research*, 4(3), 1123-1131.
14. Ergasheva, G. (2024). THE ROLE OF CORRECTIONAL PEDAGOGY IN ORGANIZING THE EDUCATION OF CHILDREN WITH DISABILITIES. *Ethiopian International Journal of Multidisciplinary Research*, 11(06), 206-207.
15. Toxirovna, E. G. (2024). QALQONSIMON BEZ KASALLIKLARIDAN HASHIMOTO TIREODIT KASALLIGINING MORFOFUNKSIONAL O'ZIGA XOSLIGI. *Modern education and development*, 16(7), 120-135.
16. Toxirovna, E. G. (2024). REVMATOID ARTRIT: BO'G'IMLAR YALLIG'LANISHINING SABABLARI, KLINIK BELGILARI, OQIBATLARI VA ZAMONAVIY DAVOLASH YONDASHUVLARI. *Modern education and development*, 16(7), 136-148.
17. Эргашева, Г. Т. (2024). ОЦЕНКА КЛИНИЧЕСКОЙ ЭФФЕКТИВНОСТИ ОРЛИСТАТА У БОЛЬНЫХ ОЖИРЕНИЕМ И АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ. *Modern education and development*, 16(7), 92-105.
18. Ergasheva, G. T. (2024). THE SPECIFICITY OF AUTOIMMUNE THYROIDITIS IN PREGNANCY. *European Journal of Modern Medicine and Practice*, 4(11), 448-453.
19. Эргашева, Г. Т. (2024). ИССЛЕДОВАНИЕ ФУНКЦИИ ЩИТОВИДНОЙ ЖЕЛЕЗЫ ПРИ ТИРЕОИДИТЕ ХАШИМОТО. *Modern education and development*, 16(7), 106-119.
20. Toxirovna, E. G. (2024). GIPOFIZ ADENOMASINI NAZORAT QILISHDA KONSERVATIV JARROHLIK VA RADIATSIYA TERAPIYASINING UZOQ MUDDATLI SAMARADORLIGI. *Modern education and development*, 16(7), 79-91.
21. ERGASHEVA, G. T. (2024). OBESITY AND OVARIAN INSUFFICIENCY. *Valeology: International Journal of Medical Anthropology and Bioethics*, 2(09), 106-111.
22. Ergasheva, G. T. (2024). Modern Methods in the Diagnosis of Autoimmune Thyroiditis. *American Journal of Bioscience and Clinical Integrity*, 1(10), 43-50.
23. Tokhirovna, E. G. (2024). COEXISTENCE OF CARDIOVASCULAR DISEASES IN PATIENTS WITH TYPE 2 DIABETES. *TADQIQOTLAR. UZ*, 40(3), 55-62.
24. Toxirovna, E. G. (2024). DETERMINATION AND STUDY OF GLYCEMIA IN PATIENTS WITH TYPE 2 DIABETES MELLITUS WITH COMORBID DISEASES. *TADQIQOTLAR. UZ*, 40(3), 71-77.
25. Toxirovna, E. G. (2024). XOMILADORLIKDA QANDLI DIABET KELTIRIB CHIQARUVCHI XAVF OMILLARINI ERTA ANIQLASH USULLARI. *TADQIQOTLAR. UZ*, 40(3), 63-70.
26. Toxirovna, E. G. (2024). QANDLI DIABET 2-TIP VA KOMORBID KASALLIKLARI BO'LGAN BEMORLARDA GLIKEMIK NAZORAT. *TADQIQOTLAR. UZ*, 40(3), 48-54.
27. Tokhirovna, E. G. (2024). MECHANISM OF ACTION OF METFORMIN (BIGUANIDE) IN TYPE 2 DIABETES. *JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH*, 3(5), 210-216.

28. Tokhirovna, E. G. (2024). THE ROLE OF METFORMIN (GLIFORMIN) IN THE TREATMENT OF PATIENTS WITH TYPE 2 DIABETES MELLITUS. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 4(4), 171-177.
29. Эргашева, Г. Т. (2024). Эффект Применения Бигуанида При Сахарным Диабетом 2 Типа И Covid-19. Research Journal of Trauma and Disability Studies, 3(3), 55-61.
30. Toxirovna, E. G. (2024). QANDLI DIABET 2 TUR VA YURAK QON TOMIR KASALLIKLARINING BEMOLARDA BIRGALIKDA KECISHI. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 38(7), 202-209.
31. Эргашева, Г. Т. (2024). СОСУЩЕСТВОВАНИЕ ДИАБЕТА 2 ТИПА И СЕРДЕЧНО-СОСУДИСТЫХ ЗАБОЛЕВАНИЙ У ПАЦИЕНТОВ. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 38(7), 219-226.
32. Эргашева, Г. Т. (2024). СНИЖЕНИЕ РИСКА ОСЛОЖНЕНИЙ У БОЛЬНЫХ САХАРНЫМ ДИАБЕТОМ 2 ТИПА И СЕРДЕЧНО-СОСУДИСТЫМИ ЗАБОЛЕВАНИЯМИ. Образование Наука И Инновационные Идеи В Мире, 38(7), 210-218.
33. Tokhirovna, E. G. (2024). CLINICAL AND MORPHOLOGICAL ASPECTS OF THE COURSE OF ARTERIAL HYPERTENSION. Лучшие интеллектуальные исследования, 12(4), 234-243.
34. Tokhirovna, E. G. Studying the Causes of the Relationship between Type 2 Diabetes and Obesity. Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN, 2456-6470.
35. Toxirovna, E. G. (2024). ARTERIAL GIPERTENZIYA KURSINING KLINIK VA MORFOLOGIK JIHATLARI. Лучшие интеллектуальные исследования, 12(4), 244-253.
36. Эргашева, Г. Т. (2024). НОВЫЕ АСПЕКТЫ ТЕЧЕНИЕ АРТЕРИАЛЬНОЙ ГИПЕРТОНИИ У ВЗРОСЛОГО НАСЕЛЕНИЕ. Лучшие интеллектуальные исследования, 12(4), 224-233.
37. Эргашева, Г. Т. (2024). ФАКТОРЫ РИСКА РАЗВИТИЯ САХАРНОГО ДИАБЕТА 2 ТИПА. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 36(5), 70-74.
38. Эргашева, Г. Т. (2024). ОСЛОЖНЕНИЯ САХАРНОГО ДИАБЕТА 2 ТИПА ХАРАКТЕРНЫ ДЛЯ КОГНИТИВНЫХ НАРУШЕНИЙ. TADQIQOTLAR. UZ, 30(3), 112-119.
39. Эргашева, Г. Т. (2023). Исследование Причин Связи Диабета 2 Типа И Ожирения. Research Journal of Trauma and Disability Studies, 2(12), 305-311.
40. Tokhirovna, E. G. (2024). Risk factors for developing type 2 diabetes mellitus. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 36(5), 64-69.
41. Toxirovna, E. G. (2024). QANDLI DIABET 2-TUR VA O'LIMNI KELTIRIB CHIQARUVCHI SABABLAR. Лучшие интеллектуальные исследования, 14(4), 86-93.
42. Tokhirovna, E. G. (2023). Study of clinical characteristics of patients with type 2 diabetes mellitus in middle and old age. Journal of Science in Medicine and Life, 1(4), 16-19.
43. Toxirovna, E. G. (2024). GIPERPROLAKTINEMIYA KLINIK BELGILARI VA BEPUSHTLIKKA SABAB BO'LUVCHI OMILLAR. Лучшие интеллектуальные исследования, 14(4), 168-175.
44. Toxirovna, E. G. (2023). QANDLI DIABET 2-TUR VA SEMIZLIKNING O'ZARO BOG'LIQLIK SABABLARINI O'RGANISH. Ta'lim innovatsiyasi va integratsiyasi, 10(3), 168-173.
45. Saidova, L. B., & Ergashev, G. T. (2022). Improvement of rehabilitation and rehabilitation criteria for patients with type 2 diabetes.

46. Эргашева, Г. Т. (2023). Изучение Клинических Особенности Больных Сахарным Диабетом 2 Типа Среднего И Пожилого Возраста. *Central Asian Journal of Medical and Natural Science*, 4(6), 274-276.
47. Toxirovna, E. G. (2023). O'RTA VA KEKSA YOSHLI BEMORLARDA 2-TUR QANDLI DIABET KECISHINING KLINIKO-MORFOLOGIK XUSUSIYATLARI. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 33(1), 164-166.
48. Ergasheva, G. T. (2022). QANDLI DIABET BILAN KASALLANGANLARDA REABILITATSIYA MEZONLARINI TAKOMILASHTIRISH. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(12), 335-337.
49. Ergasheva, G. (2024). METHODS TO PREVENT SIDE EFFECTS OF DIABETES MELLITUS IN SICK PATIENTS WITH TYPE 2 DIABETES. Журнал академических исследований нового Узбекистана, 1(2), 12-16.
50. ГТ, Э., & Саидова, Л. Б. (2022). СОВЕРШЕНСТВОВАНИЕ РЕАБИЛИТАЦИОННО-ВОССТАНОВИТЕЛЬНЫХ КРИТЕРИЕВ БОЛЬНЫХ С СД-2 ТИПА. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(12), 206-209.
51. Toxirovna, E. G. (2025). YURAK-QON TOMIR TIZIMI KASALLIKLARIDA BEMORLAR PARVARISHINING O'ZIGA XOSLIGI. *Modern education and development*, 20(2), 38-46.
52. Ergasheva, G. (2025). PECULIARITIES WHEN ACCOMPANIED BY HYPOTHYROIDISM AND IODINE DEFICIENCY IN PATIENTS WITH ADRENAL GLAND PATHOLOGY. *Modern Science and Research*, 4(2), 1133-1140.
53. Tokhirovna, E. G. (2024). Relationship of the Functional States of the Thyroid and the Reproductive System in Women under Iodine Deficiency. *Journal of Science in Medicine and Life*, 2(6), 89-94.