BOLALAR VA O'SMIR QIZLARDA REPRODUKTIV A'ZOLAR JAROHATLARINING KLINIK TAHLILI

CLINICAL ANALYSIS OF REPRODUCTIVE ORGAN INJURIES IN CHILDREN AND ADOLESCENT GIRLS

Mualliflar: Arziyeva Gulnora Boriyevna [1], Nurboboyeva Muxlisa Boxadir qizi [2]
Affiliyatsiya: PhD, dotsent, Samarqand davlat tibbiyot universiteti [1], Magistratura rezidenti, Samarqand davlat tibbiyot universiteti[2]
DOI: https://doi.org/10.5281/zenodo.23282260

ANNOTATSIYA

Bolalik va o'smirlik davridagi qizlarda jinsiy a'zolar jarohatlari bolalar ginekologiyasida muhim klinik muammolardan biri bo'lib, ularni o'z vaqtida aniqlash bemorni to'g'ri davolash taktikasini belgilashda muhim ahamiyatga ega. Maishiy va mexanik jarohatlar sonining ortib borishi ushbu muammoning dolzarbligini yanada oshirmoqda. Jarohatlarning klinik ko'rinishi bemorning yoshi, jarohatlanish mexanizmi, shikastlangan soha va to'qimalarning zararlanish darajasiga qarab farq qiladi. Kichik yoshdagi qizlarda ko'proq yumshoq to'qimalarning yengil shikastlanishi, lat yeyish va gematomalar uchrasa, o'smir qizlarda chuqurroq yirtilishlar, kuchli og'riq va qon ketish holatlari kuzatilishi mumkin. Bemorni to'liq klinik ko'rikdan o'tkazish hamda zarur hollarda instrumental tekshiruvlardan foydalanish jarohatning ko'lami va xususiyatlarini aniqlash, shuningdek, individual davolash taktikasini tanlash imkonini beradi.

Kalit so'zlar: Jinsiy a'zolar jarohati, o'smir qizlar, klinik xususiyatlar, diagnostika

ABSTRACT

Genital injuries among children and adolescent girls remain an important clinical concern in pediatric gynecology because delayed recognition may complicate the subsequent management of affected patients. The increasing occurrence of domestic and mechanical trauma has contributed to the growing relevance of this problem. The clinical presentation varies considerably according to the patient's age, mechanism of injury, anatomical localization, and degree of tissue damage. In younger girls, minor soft-tissue lesions, contusions, and hematomas are encountered more frequently, while adolescent patients may present with more extensive lacerations, significant pain, and genital bleeding. A comprehensive clinical assessment, supplemented when necessary by appropriate instrumental diagnostic procedures, is essential for determining the extent of injury and selecting an individualized treatment approach.

Keywords: Genital trauma, adolescent girls, clinical characteristics, diagnosis

Traumatic injuries of the external genitalia in children and adolescent girls remain an important issue in pediatric and adolescent gynecology. Their clinical significance is related not only to the frequency of occurrence but also to difficulties in establishing an accurate diagnosis and the possibility of subsequent complications

affecting reproductive health. Available epidemiological studies indicate that injuries to the female genital organs account for approximately 0.5–1% of traumatic injuries in children, with an increase reported in recent years. The observed trend may be associated with increased physical activity among children, urban living conditions, and the widespread use of bicycles, scooters, playground structures, and other recreational equipment. Accidental trauma is considered one of the predominant mechanisms of genital injury in girls. Among these injuries, falls with the perineum striking a solid or projecting surface, commonly referred to as straddle injuries, are particularly frequent. During such incidents, the perineal and vulvar tissues may become compressed between the child's body and the object involved in the fall, resulting in varying degrees of soft-tissue damage [Gulcin et al., 2025: 12–16]. The anatomical position of the external genitalia makes these structures especially susceptible to direct mechanical trauma.

Age-related anatomical and physiological characteristics considerably influence both the pattern and severity of genital injuries. Before puberty, the genital tissues are relatively delicate, less keratinized, and richly supplied with blood vessels. Consequently, even relatively minor trauma may produce pronounced edema, hematoma formation, or bleeding [Merritt, 2004: 371–381]. With the onset of adolescence, hormonal maturation results in progressive changes in tissue structure, elasticity, and vascularization. These age-dependent differences may modify the clinical presentation and mechanism of injury. More extensive lacerations involving the vaginal wall, perineum, and perianal tissues may therefore be encountered in adolescent patients [Girgis, 2024: 117, Glaser et al., 2021: 236].

The clinical presentation of genital trauma is determined by several factors, including the patient's age, mechanism of injury, anatomical site, and depth of tissue involvement. Common manifestations include sudden pain, local swelling, genital bleeding, difficulty or pain during urination, and emotional distress. Severe trauma may involve neighboring anatomical structures such as the urethra, rectum, or anal sphincter, resulting in combined urogenital or anorectal injuries [Fan et al., 2020: 1235–1241]. Perianal trauma is particularly important clinically because extensive lesions may require specialized surgical treatment and prolonged clinical observation [Girgis, 2024: 117]. Accurate assessment of genital injuries in children requires careful consideration of the circumstances surrounding the trauma. A distinction between accidental and non-accidental injuries is an essential component of the diagnostic process. A comprehensive history, appropriate physical examination, and assessment of whether the clinical findings correspond to the reported mechanism of injury are important for establishing an accurate diagnosis and, where necessary, conducting an appropriate medico-legal evaluation [Onen et al., 2005: 986–990]. Incorrect interpretation of clinical findings may have serious medical as well as legal implications.

The diagnostic evaluation of genital trauma may involve direct visual examination, colposcopic assessment, ultrasonography, and, in selected cases, examination under anesthesia. Ultrasonography is particularly useful because it is non-invasive, readily applicable, and does not expose the child to ionizing radiation. It may provide valuable information regarding deep hematomas, internal bleeding, and associated injuries of the pelvic structures [Glaser et al., 2021: 236, Merritt, 2009: 85–98]. The increasing availability of modern imaging techniques has consequently contributed to more precise assessment of the extent of traumatic lesions and

improved clinical decision-making. Treatment is determined primarily by the location, extent, and severity of the injury. Minor lesions, including superficial abrasions, limited contusions, and small hematomas, can generally be treated using conservative measures, local care, and clinical observation [Fan et al., 2020: 1235–1241]. In contrast, deep lacerations, persistent or significant hemorrhage, and injuries involving adjacent organs may necessitate surgical repair, frequently under anesthesia. The use of standardized approaches and classification systems for assessing genital trauma may facilitate more consistent evaluation of injury severity and selection of appropriate treatment [Bergus et al., 2024: 59]. The consequences of genital trauma are not limited to the acute period. Inadequate treatment or delayed recognition of significant injuries may increase the risk of infection, abnormal scar formation, persistent pain, and, in later life, sexual dysfunction or impaired reproductive health [Hoshi et al., 2021: 523–528]. For this reason, prompt recognition of clinically significant injuries and appropriate treatment are essential components of preserving the long-term health and quality of life of affected patients.

Fall-related injuries deserve particular attention because they constitute a substantial proportion of accidental genital trauma in children and are potentially preventable. Reports from pediatric surgical and gynecological literature indicate that falls are among the leading reasons for emergency evaluation of girls with genital injuries [Takei et al., 2018:34]. These observations emphasize the importance of injury-prevention measures, adequate parental supervision, age-appropriate safety education, and maintaining safer environments for children's physical activities. Taken together, the increasing occurrence of genital trauma, the diversity of injury mechanisms, age-dependent anatomical and clinical characteristics, and the need for individualized diagnostic and therapeutic approaches demonstrate the clinical relevance of this problem. A detailed assessment of genital injuries throughout childhood and adolescence may contribute to earlier recognition of significant trauma, more appropriate treatment selection, and reduction of potential long-term complications affecting reproductive health.

The present study is among the first investigations in Uzbekistan to examine age-related clinical and diagnostic characteristics of genital trauma in girls. The findings may provide additional evidence for improving the early recognition, diagnostic evaluation, and management of these injuries in pediatric and adolescent gynecological practice.

Aim. The aim of this study was to evaluate the occurrence, age-related clinical characteristics, and management approaches of external genital injuries in girls during childhood and adolescence.

Materials and Methods. The study included a total of 60 female patients who presented with traumatic injuries of the external genital organs. According to age, the patients were divided into two groups:

- Main group: 30 girls aged 1–12 years;
- Comparison group: 30 adolescent girls aged 13–18 years.

Study Design. The study was conducted using a combination of retrospective analysis and prospective clinical observation. The retrospective component involved a review of available medical records to assess the type, mechanism, anatomical characteristics, and clinical outcomes of external genital injuries. The prospective component consisted of a detailed clinical examination of all included patients. Information was collected regarding the circumstances and mechanism of injury,

initial clinical manifestations, previous medical management, diagnostic findings, treatment methods, and clinical course during follow-up.

The collected data were analyzed with consideration of the patients' age and the clinical characteristics of the injuries in order to identify age-related differences in the presentation and management of external genital trauma.

Diagnostic Methods. To determine the nature, localization, and severity of traumatic lesions, all patients underwent a standardized clinical and, when clinically indicated, instrumental diagnostic assessment.

Clinical Examination. A detailed gynecological examination was performed in all patients, taking into account their age and clinical condition. During the examination, the localization and characteristics of traumatic lesions were assessed, including abrasions, contusions, hematomas, soft-tissue lacerations, and bleeding. The intensity of pain, local edema, tenderness, and the presence of functional complaints were also documented. Particular attention was paid to identifying signs suggestive of deeper tissue involvement or associated injuries.

Ultrasonographic Examination.Ultrasonography was performed when indicated to obtain additional information about the extent and depth of tissue injury. The examination was used to identify hematomas, fluid collections, deeper soft-tissue lesions, and possible involvement of adjacent anatomical structures. Ultrasonographic findings were evaluated together with the clinical examination and were used to characterize injuries as predominantly superficial lesions, trauma associated with hematoma formation, or deeper lacerations with or without active bleeding.

Laboratory Investigations. Laboratory tests were conducted according to the clinical indications and severity of the traumatic injury. Complete blood count and hemoglobin concentration were assessed, particularly in patients presenting with clinically significant or persistent bleeding. These parameters were used to evaluate the possible extent of blood loss and to assist in determining the appropriate management strategy.

Data Collection. For each patient, demographic, clinical, diagnostic, and treatment-related information was recorded. The following variables were included in the analysis:

- Demographic characteristics: age and sex.
- Circumstances and mechanism of injury: accidental falls, sports-related trauma, household accidents, and bicycle- or scooter-related injuries.
- Clinical characteristics: anatomical localization and type of injury, severity of tissue damage, presence of bleeding, associated clinical manifestations, treatment modality, and complications.
- Diagnostic characteristics: findings obtained during clinical examination, ultrasonography, and laboratory investigations when performed.
- Treatment-related information: initial medical management, conservative or surgical treatment, and subsequent clinical course.
- Time-related characteristics: interval between the traumatic event and presentation to a medical facility, as well as information regarding any treatment received before hospitalization or specialist evaluation.

Characteristics of the Study Groups. Main Group: Girls Aged 1–12 Years. In the younger age group, traumatic lesions were predominantly localized to the superficial tissues of the external genital region. Contusions, abrasions, localized edema, and

small hematomas were among the most frequently identified findings. The majority of injuries were associated with accidental falls, household incidents, or low-energy mechanical trauma. Severe bleeding and extensive tissue disruption were observed less frequently.

Comparison Group: Adolescent Girls Aged 13–18 Years. In adolescent patients, the clinical pattern of trauma was characterized more frequently by extensive soft-tissue damage and deeper lacerations. Bleeding and more pronounced pain were observed more often compared with the younger age group. Sports-related trauma, falls associated with greater impact, and other high-energy accidental mechanisms constituted important causes of injury in this group.

The comparative analysis of the two age groups was performed to identify differences in the mechanism, clinical presentation, severity, diagnostic findings, and management of external genital injuries according to age.

Results. The study comprised 60 female patients with external genital injuries who were divided into two age groups. The main group included 30 girls aged 1–12 years, while the comparison group consisted of 30 adolescent girls aged 13–18 years. Comparative analysis demonstrated age-related differences in the type, severity, and clinical manifestations of traumatic injuries.

1. Types of Injuries. In the main group, superficial lacerations were the predominant type of injury, identified in 16 patients (53.3%). Hematomas were observed in 9 patients (30.0%), while minor vaginal tears were recorded in 5 patients (16.7%).

Among adolescents, deep lacerations occurred most frequently and were identified in 12 patients (40.0%). Hematomas were present in 9 patients (30.0%), superficial lacerations in 6 patients (20.0%), and other complex injuries in 3 patients (10.0%).

These findings demonstrate a predominance of relatively superficial traumatic lesions among younger girls, whereas deeper and more extensive injuries were observed more frequently in adolescents.

2. Mechanisms of Injury. Accidental falls represented the most frequent mechanism of genital trauma, accounting for 28 cases (46.7%) across both age groups. Domestic accidents were responsible for 16 cases (26.7%), sports-related injuries for 10 cases (16.7%), and bicycle- or scooter-related incidents for 6 cases (10.0%).

In the main group, falls were documented in 14 patients (46.7%), domestic accidents in 8 (26.7%), sports-related injuries in 5 (16.7%), and bicycle or scooter accidents in 3 (10.0%).

A similar distribution was observed in the comparison group: 14 patients (46.7%) sustained injuries following falls, 8 (26.7%) following domestic accidents, 5 (16.7%) during sports activities, and 3 (10.0%) in bicycle- or scooter-related incidents.

3. Clinical Presentation. Pain was the most consistent clinical manifestation and was reported in all 60 patients (100%), regardless of age group. Bleeding was documented in 3 patients (10.0%) in the main group and in 12 patients (40.0%) in the comparison group. Urinary difficulties were identified in 8 girls (26.7%) from the main group, whereas no cases of urinary dysfunction were recorded among adolescents.

The findings indicate that pain represents a common manifestation of external genital trauma in both age groups. In contrast, bleeding occurred considerably more frequently among adolescents, which may be associated with the greater depth and

extent of traumatic lesions observed in this group. Urinary complaints were predominantly identified among younger patients.

Treatment and Management. Most injuries in the younger age group were successfully managed conservatively, including local wound care and analgesic therapy, which were sufficient in 75% of cases. In the adolescent group, conservative treatment was used in 65% of patients, while 35% required surgical management because of deeper or more complex injuries. No surgical intervention was required among younger children.

Discussion. The results demonstrate clear age-related differences in the clinical severity of genital injuries. Superficial lesions predominated among younger girls, whereas adolescents more frequently presented with deeper and complex trauma. These findings correspond with previously reported international data and may reflect age-related anatomical and physiological differences. Falls were the leading mechanism of injury in both groups, emphasizing the importance of preventive measures, parental supervision, and safer environments. The greater need for surgical treatment among adolescents indicates a higher frequency of severe injuries and highlights the importance of early diagnosis and timely intervention.

Overall, the findings support an age-specific approach to the assessment and management of genital trauma in girls, with individualized treatment according to injury severity.

Summary. Younger girls predominantly experienced superficial injuries, while adolescents more often sustained deeper and complex lesions. Falls and domestic accidents were the main causes of trauma, and pain was the most frequent clinical symptom. Surgical treatment was required mainly in adolescents with more severe injuries. These findings emphasize the importance of early diagnosis, age-specific management, and individualized treatment to reduce complications and protect future reproductive health.

REFERENCES

1. Gulcin N., Erkoc B.M., Gul C., Mirapoglu S.L., Sahin C., Kaymakci A. External genital injuries in children presenting due to falls. Turkish Journal of Pediatric Surgery. 2025;39(1):12–16.
2. Girgis N.N. Outcome of peri-anal injury management in children and adolescents. QJM: An International Journal of Medicine. 2024;117(Suppl. 2):hcae175.724.
3. Merritt D.F. Vulvar and genital trauma in pediatric and adolescent gynecology. Current Opinion in Obstetrics and Gynecology. 2004;16(5):371–381.
4. Glaser Z.A., Singh N., Koch C., Dangle P.P. Pediatric female genital trauma managed under conscious sedation in the emergency department versus general anesthesia in the operating room: a single-center comparison of outcomes and cost. Journal of Pediatric Urology. 2021;17(2):236.e1–236.e8.
5. Fan S.M., Grigorian A., Chaudhry H.H., Allen A., Sun B., Jasperse N., et al. Female pediatric and adolescent genitalia trauma: a retrospective analysis from the National Trauma Data Bank. Pediatric Surgery International. 2020;36(10):1235–1241.
6. Onen A., Oztürk H., Yayla M., Basuguy E., Gedik S. Genital trauma in children: classification and management. Urology. 2005; 65(5): 986–990.

7. Merritt D.F. Genital trauma in the pediatric and adolescent female: review. Obstetrics and Gynecology Clinics of North America. 2009; 36 (1): 85–98.
8. Bergus K., Frooman A., Castellanos S., et al. Characterization of pediatric female genital trauma using a novel grading system and recommendations for management. Journal of Pediatric Surgery. 2024; 59 (10):161599.
9. Hoshi R., Uehara S., Hashimoto M., Hosokawa T., Kawashima H., Kaneda H., et al. Diagnosis and management of genital injuries in girls: 14-year experience. Pediatrics International. 2021;63(5):523–528.
10. Takei H., Nomura O., Hagiwara Y., Inoue N. The management of pediatric genital injuries at a pediatric emergency department. Pediatric Emergency Care. 2018;34.