AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

FORENSIC MEDICAL ASSESSMENT OF MECHANICAL INJURIES TO THE EXTERNAL STRUCTURE OF MALE REPRODUCTIVE ORGANS

https://doi.org/10.5281/zenodo.18372321

Indiaminov S.I.[1], Mavlyanov S.N.[2]

[1.]*Republican Scientific and Practical Center for Forensic Medical Examination of the Ministry of Health of the Republic of Uzbekistan, Tashkent.*

[2.]*Karakalpakstan branch of the Republican Scientific and Practical Center for Forensic Medical Examination, Nukus. E-mail: sayit.indiaminov@bk.ru*

Annotation

The article examines issues of forensic medical assessment of the severity of health damage and clarifies the mechanism of injury to the external structure of male reproductive organs—the penis. An analysis was conducted of treatment outcomes and forensic medical examinations of 21 individuals who suffered from blunt force trauma. Medical criteria for determining the degree of health damage are presented, taking into account the nature and types of injury, complications, and consequences of organ damage. It is noted that in cases of penile injuries caused by blunt objects, a direct mechanism of trauma predominates.

Keywords

mechanical injury, reproductive organs, male, external structure, severity of health damage, mechanism.

Relevance.

Mechanical injuries to the reproductive organs caused by blunt and sharp objects occur more frequently in males than in females. This is due to the anatomical characteristics of these structures in men, as well as the fact that men are more often engaged in trauma-prone heavy labor and participate more frequently in high-risk sports compared to women. Injuries to the external reproductive structures (the penis and scrotum) in men may also be observed in individuals with mental disorders, as well as in persons with pathological sexual behaviors. In addition, such injuries may result from bites or occur during reconstructive surgical procedures, representing so-called iatrogenic injuries. The perineum and the area of the external reproductive structures in men are considered reflexogenic zones; therefore, injuries to these areas undoubtedly affect reproductive and fertilizing functions, that is, male reproductive capacity. The medical qualification criteria for determining the severity of bodily injuries, specified in Appendices No. 2 and 9 to the Order of the Ministry of Health of the Republic of Uzbekistan No. 153 dated

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

June 1, 2012, do not fully cover all types of injuries to the reproductive organs, nor their complications and consequences that are significant for forensic medical assessment of the severity of harm to health in such injuries [4]. Morphological features of injuries to specific structures of the reproductive organs, which are necessary to substantiate the mechanism of trauma formation, remain insufficiently studied. The thanatogenesis of fatal outcomes in isolated and combined mechanical injuries of the male reproductive organs also remains unclear.

Aim of the study. To уточify medical criteria for determining the severity of health damage resulting from penile injuries and to substantiate the mechanisms of traumatic injury to this organ.

Materials and Methods. An analysis was conducted of treatment outcomes and forensic medical examination data involving 21 injured individuals aged up to 60 years. Among them, adults aged 18–60 years accounted for 13 cases (61.9%), while children and adolescents constituted 8 cases (38.1%).

Table 1

Age Categories of Patients with Injuries to Penile Structures

№	Age Categories	Absolute Number (n)	%
1	4-6	3	14,3
2	7-10	2	9,5
3	11-14	3	14,3
4	18-24	5	23,8
5	25-40	5	23,8
6	41-60	3	14,3
Total		**21**	**100,0**

Anamnestic data, results of clinical and laboratory examinations, and instrumental studies—including ultrasound examination (US), Doppler ultrasonography, radiography, urography, urethrography, and computed tomography (CT)—were taken into account. Statistical analysis was performed using methods of variational statistics, with determination of the reliability criterion of injury indicators (t), their standard error (m), and the significance of differences (p).

Results and Discussion.

The causes of organ injuries were associated with falls from various heights (n = 5), kicks to the perineal region (n = 13), falls from a bicycle (n = 2), and in-vehicle automobile trauma (n = 1).

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

Table 2

Circumstances of Injury to Penile Structures

№	Circumstances of Injury	Absolute Number (n)	%
1	Falls from various heights	15	71,4
2	Kicks to the genital region	3	14,3
3	Falls from a bicycle	2	9,5
4	In-vehicle automobile trauma	1	4,8
Total		**21**	**100,0**

Depending on the nature of the injuries, the following were observed: contusions of the penis and urethra (n = 13); contusions of the penis with urethral rupture (n = 6); and fractures of the organ (n = 2).

During the analysis of organ injuries, the characteristics, localization, extent, morphology, clinical course, complications, diagnostic methods, treatment approaches, as well as long-term consequences of trauma and the duration of work capacity recovery in the injured individuals were studied. For these purposes, unified clinical and morphological classifications of injuries to these structures were applied [5].

Table 3

Nature of Injuries to Penile Structures

№	Nature of Injury	Absolute Number (n)	%
1	Contusions of the penis	8±0.04	38,1
2	Contusions of the penis with urethral ruptures of varying severity	6±0.03	28,6
3	Contusions of the penis and urethra	5±0.02	23,8
4	Penile fractures	2±0.01	9,5
Total		**21**	**100,0**

In cases of contusions of the penis and urethra (n = 13), ecchymosis of the skin of the penis and perineum was observed, along with drop-like bleeding from the external urethral orifice and pain response upon palpation of the affected area. Contrast urethrography revealed no urethral damage, while ultrasonography confirmed preservation of the integrity of the urinary bladder and testes. All patients received conservative (therapeutic) treatment. The duration of hospital stay ranged from 3 to 5 days, followed by outpatient management. The time required for restoration of general working capacity did not exceed 3 weeks. Long-term outcomes were satisfactory.

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

In cases of contusions of the penis with urethral ruptures (n = 6), swelling and ecchymosis of the skin of the organ and perineum were noted, accompanied by bloody discharge from the urethra and pain on palpation. Urethrography demonstrated extravasation of contrast medium into the surrounding tissues of the posterior urethra. Urethral ruptures were confirmed in all affected patients. All patients underwent surgical treatment.

Figure 1. Case No. 12.. CT scan showing urethral rupture in a patient with penile contusion involving the corpus spongiosum.

The duration of hospital stay for patients ranged from 4 to 9 days, followed by outpatient treatment. The period of recovery of working capacity in patients with urethral ruptures was up to 4 weeks. Long-term outcomes were favorable.

Thus, the severity of health damage in all types of penile contusions, including those accompanied by uncomplicated urethral rupture, is determined based on the criterion of the duration of health impairment. It should be noted that penile contusions are often combined with contusions of the scrotum. These areas are reflexogenic zones, particularly the glans penis. Therefore, contusions of the organ may be accompanied by manifestations of pain shock, which should be taken into account during forensic qualification of contusion-related conditions. After traumatic rupture of the tunica albuginea, necrosis of the penile skin may develop. In addition, contusions of the penis and scrotum, especially in cases of extensive hematomas, may lead to venous thrombosis and purulent-septic complications.

It should also be emphasized that, in addition to its urinary function, the male urethra also serves a reproductive (ejaculatory) function. Therefore, the study of the nature, types, extent, complications, and consequences of mechanical injuries to these structures is of particular interest. Injuries to the posterior urethra are usually observed in pelvic trauma or penetrating injuries of the pelvic cavity, whereas injuries to the anterior urethra [2] are associated with penile trauma, most commonly in cases of fracture, amputation, or strangulation.

According to the classification proposed by Colapinto and McCallum (1977), based on radiological findings, five types of posterior urethral injuries are distinguished: Type 1 – rupture of the puboprostatic ligament with formation of a

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

periprostatic hematoma, stretching the urethra without rupture; Type 2 – partial or complete rupture of the membranous urethra above the urogenital diaphragm, with contrast extravasation beyond the urogenital diaphragm into the pelvis on urethrography; Type 3 – partial or complete rupture of the membranous urethra with disruption of the urogenital diaphragm, resulting in contrast spread into both the pelvis and perineum; Type 4 – injury to the bladder neck with extension into the urethra; Type 5 – complete rupture of the posterior urethra [3]. All of the above types, except Type I, are considered life-threatening conditions.

Penile fractures were observed in two individuals aged 23 and 42 years. One patient sought medical care immediately after the injury, while the other presented on the second day following trauma.

The injured individuals complained of severe pain, pronounced swelling, deformation of the penile shaft, difficulty urinating, and general malaise. Physical examination revealed penile deformity, marked edema and ecchymosis, absence of bleeding from the urethral meatus, and intolerable pain on palpation. Both patients received conservative treatment, as the penile fractures occurred without rupture of the corpora cavernosa. The duration of hospital stay was 5 and 7 days, respectively, followed by outpatient treatment. Restoration of general work capacity occurred after 4 and 6 weeks, respectively.

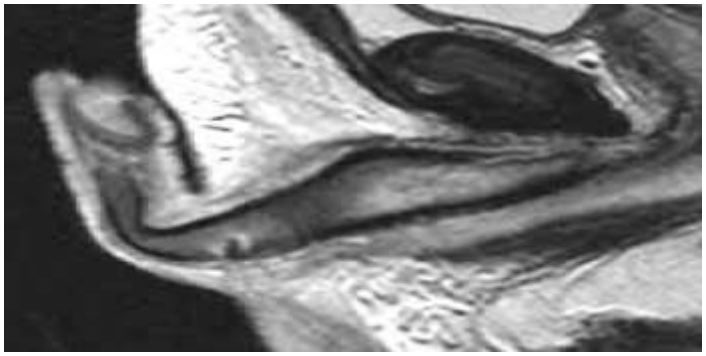

Рисунок. Наблюдение № 19. КТ - перелом полового члена без поражения пещеристого тела

Figure. Case No. 19.

CT scan showing a penile fracture without involvement of the corpora cavernosa.

During the forensic medical examination, no penile deformity was detected. Therefore, when qualifying the severity of health damage associated with penile fractures, the criterion of the duration of health disorder exceeding three weeks may be applied.

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-1| 2026 Published: |30-01-2026|

However, it should be taken into account that penile fracture accompanied by rupture of the corpora cavernosa and corpus spongiosum is associated with severe pain, which may lead to the development of shock. In such cases, internal bleeding begins, and a hematoma may form, reaching large sizes with extension into the suprapubic, femoral regions, and the anterior abdominal wall. These conditions require emergency surgical intervention, as conservative treatment results in complications in approximately 35% of affected individuals, including the development of adhesions, penile curvature with painful erections, and other pathological conditions. In the long-term post-traumatic period, such injuries may result in loss of the ability to perform sexual intercourse, which allows these injuries to be classified as severe bodily harm.

In addition, penile fracture occurring in the state of erection is accompanied by rupture of the tunica albuginea and formation of a hematoma. In the long-term period following penile fracture, deformation of the organ may also be observed. Ultrasonography is the primary diagnostic method for detecting rupture of the tunica albuginea.

In cases of penile dislocation, similar to fracture, rupture of the ligaments fixing the penis to the pelvic bones occurs, and the corpora cavernosa are displaced under the skin of the perineum, thigh, or suprapubic region, while the penis is palpated as an “empty sac.” This condition also requires emergency surgical intervention to prevent loss of the organ.

Penile strangulation by various ring-shaped objects, ropes, rubber bands, wires, and similar items—usually applied by the injured individuals themselves to achieve prolonged erection or by persons with mental disorders—is accompanied by impaired blood circulation and lymphatic drainage. This may lead to trophic disorders up to the development of penile necrosis and gangrene, requiring amputation of the affected part. The level of amputation may involve the glans penis or one-third to two-thirds of the penile shaft. Thus, penile strangulation may result in complete or partial loss of the organ. A case of death due to acute local and systemic circulatory failure following penile strangulation by a metal ring has been described in the literature [1].

In cases of open extensive penile injuries, often combined with scrotal trauma, massive bleeding is observed, requiring immediate measures to prevent the development of traumatic (hemorrhagic) shock. Consequently, open extensive penile injuries may pose a life-threatening condition and a risk of organ loss. In the long-term period after extensive injuries, deforming scars are frequently observed.

Conclusions

The medical criterion for qualifying the severity of health damage in cases of contusions of the penis and urethra without violation of anatomical integrity is the duration of health disorder. In urethral ruptures of grades 2–5, signs of life-threatening conditions may be observed.

Penile fracture and strangulation with involvement of the corpus spongiosum may result in loss of the ability to engage in sexual intercourse, while penectomy of any extent constitutes a sign of organ loss. Any degree of penectomy has a pronounced negative psychological impact on the affected individuals. In extensive penile injuries or contusions of the glans penis, traumatic (pain-related) shock may develop.

Defects and consequences of extensive injuries to the external reproductive structures in males may lead to irreversible conditions.

Thanatogenesis of fatal outcomes in isolated mechanical injuries of the external male reproductive organs is associated with severe shock, acute local and systemic circulatory disturbances (thrombosis), or septic complications.

The formation of blunt injuries to the external reproductive structures in males is primarily caused by a direct mechanism of trauma—impact by blunt objects, most commonly kicks to the genital region or collision of these areas with blunt surfaces, and in some cases compression.

REFERENCES:

1. Казаров Р.Л., Абилов А.А., Бекр Х.А., Дубинский В.Я. Травма полового члена (описание клинических наблюдений). Урологические ведомости Том 6 № 4 2016. с. 37-39. Doi: 10.17816/uroved6437-39
2. Лопаткин Н.А. Урология. Национальное руководство. 2009, с. 775-778.
3. Colapinto, V., & McCallum, R. W. (1977). Injury to the male posterior urethra in fractured pelvis: A new classification. *Journal of Urology, 118*(4), 575–580.
4. Приказ МЗ РУз №153 от 01.06.2012г
5. Классификация травм полового члена Европейской урологической ассоциации (EUA, 2007)

Information about the authors:

Indiaminov Sayit Indiaminovich

DSc, professor, Deputy Director of the Republican Scientific and Practical Center Ministry of Health of Uzbekistan. Tashkent, Uzbekistan. Professor, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan. тел:+998933371090. e-mail: sayit.indiaminov@bk.ru; ORCID: https://orcid.org/0000-0001-9361-085x, Tashkent city, Almazar district, Shifokorlar street-2, no. 7M. index 100109.

Mavlyanov Sanjar Norbutaevich

State forensic expert Karakalpak branch of the Republican Scientific and Practical Center for Forensic Medical Examination. Nukhus, Uzbekistan. Email: fkojalepesova@gmail.com. Tel.: +998941443344. ORCID:https://orcid.org/0009-0004-4924-4185 Nukhus city, I.Karimov street-43\36