Scientific Research Publishing

Open Journal of Urology, 2025, 15(6), 226-234
https://www.scirp.org/journal/oju
ISSN Online: 2160-5629
ISSN Print: 2160-5440

Impact of Time to Surgical Repair on Erectile Function and Clinical Outcomes Following Penile Fracture: A Retrospective Cross-Sectional Study at Two Specialist Hospitals in North-West Cameroon

Titus Tagang Ngwa-Ebogo[1,2,3*], Landry Oriol Mbouche[4], Marie Louise Manka'a[2], Divine Enoru Eyongeta[5], Forcha Yannick Tandu[3], Marcella Derboise Christelle Biyouma[6], Fru Forbuzshi Angwafo III[4]

[1]Faculty of Health Sciences, University of Bamenda, Bamenda, Cameroon
[2]MD Research Group, Bamenda, Cameroon
[3]Department of Surgery, Regional Hospital Bamenda, Bamenda, Cameroon
[4]Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon
[5]Faculty of Health Sciences, University of Buea, Buea, Cameroon
[6]Urology Service, l'Hopital Laquintinie, Douala, Cameroon
Email: *ngwa.ebogo@uniba.cm

How to cite this paper: Ngwa-Ebogo, T.T., Mbouche, L.O., Manka'a, M.L., Eyongeta, D.E., Tandu, F.Y., Biyouma, M.D.C. and Angwafo III, F.F. (2025) Impact of Time to Surgical Repair on Erectile Function and Clinical Outcomes Following Penile Fracture: A Retrospective Cross-Sectional Study at Two Specialist Hospitals in North-West Cameroon. *Open Journal of Urology*, **15**, 226-234.
https://doi.org/10.4236/oju.2025.156024

Received: May 1, 2025
Accepted: June 22, 2025
Published: June 25, 2025

Abstract

Background: Penile fracture is a urological emergency that requires prompt surgical repair to prevent functional complications. However, delayed presentation and treatment are common in sub-Saharan Africa, potentially impacting outcomes. This study aimed to evaluate the effect of time to surgical intervention on erectile function and other clinical outcomes in penile fracture cases. **Methods:** A retrospective cross-sectional study was conducted over a five-year period (2019-2024) at Nkwen Baptist Hospital and Regional Hospital Bamenda, Cameroon. Twenty-six patients with confirmed penile fracture who underwent surgical repair were included. Patients were categorized into early (<24 hours) and delayed (≥24 hours) surgery groups. Data on socio-demographics, clinical presentation, operative findings, and outcomes were analyzed using chi-square and t-tests. Multivariate analysis using penalized logistic regression was applied to identify independent predictors of erectile dysfunction. **Results:** Of the 26 patients, 15 (57.7%) underwent early surgery while 11 (42.3%) had delayed surgery. Erectile dysfunction was observed exclusively in the delayed group (45.5% vs. 0%, $p = 0.0163$). Time to resume sexual activity was significantly shorter in the early group (9.5 vs. 12.3 weeks, $p < 0.0001$). Post-

operative complications were more frequent in delayed cases (45.5% vs. 0%, p = 0.0163). Multivariate analysis confirmed delayed surgery as a strong independent predictor of erectile dysfunction (adjusted OR: 10.5, 95% CI: 1.1 - 98.7). **Conclusion:** Early surgical repair (<24 hours) of penile fracture significantly improves erectile function and reduces complications. Timely diagnosis, prompt referral, and increased public awareness are critical for optimal outcomes in penile fracture management.

Keywords

Penile Fracture, Erectile Dysfunction, Surgical Timing, Urological Emergencies, Cameroon

1. Introduction

Penile fracture is an uncommon but serious urological emergency characterized by the rupture of the tunica albuginea of the corpus cavernosum following blunt trauma to an erect penis [1] [2]. Typically resulting from sexual intercourse, masturbation, or forceful manipulation, penile fracture necessitates prompt surgical intervention to prevent long-term complications such as erectile dysfunction, penile curvature, and urethral injuries [3] [4]. Globally, the incidence and mechanisms vary geographically due to differences in sexual practices and cultural behaviors [5] [6] and the timing of surgical intervention for penile fracture is heavily influenced by socio-cultural and systemic factors. In countries like Brazil, early presentation is common, with most patients seeking care within 24 hours, resulting in better functional outcomes [7]. However, in North Africa, delayed consultation is more frequent due to embarrassment, stigma, and cultural taboos around sexual injuries. Studies from Morocco show that such delays increase complications, including erectile dysfunction and penile curvature, even when surgery is performed [8] [9]. Forced penile manipulation, often practiced to suppress unwanted erections due to cultural norms, is a leading cause of injury in these regions [9]. These findings mirror trends in sub-Saharan Africa, where similar socio-cultural barriers and limited access to specialized care led to poor outcomes [3] [10]. Addressing these delays requires not only surgical preparedness but also public education and culturally sensitive awareness campaigns.

Studies from Africa suggested that delays in presentation and in treatment are common due to embarrassment, limited access to specialized urological care, and cultural factors [3] [11]. In Nigeria, delayed presentations have been shown to affect outcomes significantly [10]. Similarly, hidden or atypical presentations complicate diagnosis and delay treatment initiation [12]. Early surgical repair has been associated with better outcomes, whereas conservative management and late intervention are linked to higher rates of erectile dysfunction and penile deformity [13].

Despite an increasing number of reports globally, including Africa, there is a paucity of comprehensive local data from Cameroon. Particularly, there is limited evaluation of how the timing of surgical intervention influences erectile function and clinical recovery. This gap is significant as the early versus delayed intervention debate has major implications for treatment protocols, patient counseling, and resource allocation [1] [11]. Hence, this study was undertaken to assess the impact of time to surgery on erectile function and clinical outcomes among penile fracture patients managed at two major hospitals in Bamenda, Cameroon.

The objectives were to determine the relationship between time to surgical repair and postoperative erectile function, to evaluate other clinical outcomes such as penile curvature, urinary complications, time to resumption of sexual activities, and to compare our findings with those reported globally.

2. Materials and Methods

2.1. Study Design and Setting

This retrospective cross-sectional study was conducted at Nkwen Baptist Hospital and Regional Hospital Bamenda, Cameroon. Medical records from January 2019 to December 2024 were reviewed. Both hospitals serve as tertiary referral centers for urological emergencies in the North-West region.

2.2. Study Population

We reviewed the files of all male patients aged 18 years and above who were clinically and/or radiologically diagnosed with penile fracture and underwent surgical repair at either Nkwen Baptist Hospital or Regional Hospital Bamenda between January 2019 and December 2024 were considered eligible for inclusion in this study. To be included, patients had to have a confirmed diagnosis of penile fracture, documented intraoperative findings, and complete follow-up data, including evaluation of postoperative erectile function using the International Index of Erectile Function (IIEF-5) questionnaire.

Patients were excluded from the study if they were managed conservatively without surgical intervention or if their medical records were incomplete—particularly those missing operative details or postoperative outcome data related to erectile function, penile curvature, or urinary symptoms. Additionally, patients with a prior history of penile fracture, known pre-existing erectile dysfunction, or those who declined consent or could not be reached for follow-up evaluation were excluded from analysis.

2.3. Definition of Operational Terms

- *Early Surgery*: Surgical intervention within 24 hours of trauma.
- *Delayed Surgery*: Surgical intervention more than 24 hours after trauma.
- *Erectile Dysfunction*: Defined by patient report corroborated with the International Index of Erectile Function (IIEF-5) questionnaire score <22 six months postoperatively.

2.4. Data Collection

Patients diagnosed with penile fractures were determined by reviewing the registers at the urology clinics and theatre registers of both hospitals. The medical files were evaluated to inclusion after which data were collected. Data extracted included demographics (age, marital status, occupation), injury characteristics (mechanism, timing, site of tear, presence of urethral injury), operative details (surgical approach, suture material). The patients were subsequently called by telephone calls for consent to include them in the study and to evaluate the outcomes (erectile function, penile curvature, urinary symptoms, time to resumption of sexual activities).

2.5. Surgical Technique

Standardized penile exploration was performed through a subcoronal circumferential degloving incision. Hematoma evacuation was followed by tunica albuginea repair using 3-0 Vicryl interrupted sutures. Urethral injuries, when present, were repaired primarily over a Foley catheter.

2.6. Data Analysis

Descriptive statistics summarized patient characteristics and outcomes. Chi-square and t-tests were used to assess associations between time to surgery and erectile function outcomes. A p-value <0.05 was considered statistically significant.

3. Ethical Considerations

Ethical approval was granted by the IRB of Cameroon Baptist Convention Health Services (IRB2024-25 of January 12, 2025) and administrative authorization from both hospitals. Informed consent was obtained. The study followed the Declaration of Helsinki principles.

4. Results

4.1. Demographic Characteristics

The mean age was 36.8 ± 8.4 years (range 22 - 55). Majority were married (69.2%) and engaged in formal employment (57.7%).

4.2. Clinical and Intraoperative Findings

Sexual intercourse, predominantly in the "woman-on-top" position, accounted for 73% of injuries. Mean time from trauma to hospital presentation was 18.6 hours (range 2 - 72 hours). Fifteen patients (57.7%) underwent early surgery while 11 (42.3%) had delayed surgery.

Intraoperative findings included right-sided corporal rupture in 53.8%, left-sided rupture in 34.6%, and bilateral rupture in 11.6%. Associated urethral injury was identified in 5 patients (19.2%) (Table 1).

Table 1. Socio-demographic and clinical characteristics.

Parameter		Frequency (%)	Mean ± SD
Age (years)		-	36.8 ± 8.4
Marital Status	Married	18 (69.2%)	-
	Single	8 (30.8%)	-
Employment	Formal	15 (57.7%)	-
	Unemployed	7 (26.9%)	-
	Others	4 (15.4%)	-
Timing of Surgery	Early Surgery	15 (57.7%)	-
	Delayed Surgery	11 (42.3%)	-
Urethral Injury	Present	5 (19.2%)	-
	Absent	21 (80.8%)	-
Erectile Dysfunction	Present	5 (19.2%)	-
	Absent	21 (80.8%)	-
Penile Curvature	Present	3 (11.5%)	-
	Absent	23 (88.5%)	-

4.3. Postoperative Outcomes

Postoperative erectile dysfunction was documented in 5 patients (19.2%), all of whom had delayed surgery. Penile curvature occurred in 3 patients (11.5%), urinary symptoms in 2 patients (7.7%), and wound infection in 1 patient (3.8%). Mean time to resumption of sexual activities was 9.5 weeks in the early group and 12.3 weeks in the delayed group.

There was a statistically significant association between time to surgery and erectile dysfunction ($\chi^2 = 5.77$, $p = 0.0163$). Patients undergoing delayed surgery were more likely to experience erectile dysfunction. Similarly, patients in the early surgery group resumed sexual activity significantly earlier than those in the delayed group ($t = -\infty$, $p = 0.0000$). Also, there was a significant association between delayed surgery and occurrence of complications ($\chi^2 = 5.77$, $p = 0.0163$) (Table 2).

To further explore these associations, a penalized logistic regression model was applied to adjust for potential confounding variables such as postoperative complications and time to resumption of sexual activity. After adjustment, delayed surgery remained a strong independent predictor of erectile dysfunction. The coefficient for early surgery (coded as 1) was −34.51, indicating that early surgical intervention was strongly protective against erectile dysfunction. Additionally, both the presence of complications and increased time to sexual activity were positively associated with erectile dysfunction (Table 3). This multivariate model confirmed the robustness of the bivariate associations observed and underscores the clinical importance of timely surgical repair in preserving postoperative erectile function.

Table 2. Relationship between socio-demographic, clinical characteristics and outcomes.

Parameter		Frequency(%)	Mean ± SD	OR/t/χ^2	p-value
Age (years)		-	36.8 ± 8.4	t = −1.23	0.228
Marital Status	Married	18 (69.2%)	-	χ^2 = 0.76	0.382
	Single	8 (30.8%)	-	-	
Employment	Formal	15 (57.7%)	-	χ^2 = 1.24	0.265
	Unemployed	7 (26.9%)	-	-	
	Others	4 (15.4%)	-	-	
Timing of Surgery	Early Surgery	15 (57.7%)	-	-	**0.016**
	Delayed Surgery	11 (42.3%)	-	χ^2 = 5.77	
Urethral Injury	Present	5 (19.2%)	-	χ^2 = 3.14	0.076
	Absent	21 (80.8%)	-	-	
Erectile Dysfunction	Present	5 (19.2%)	-	χ^2 = 5.77	**0.016**
	Absent	21 (80.8%)	-	-	
Penile Curvature	Present	3 (11.5%)	-	χ^2 = 2.67	0.102
	Absent	23 (88.5%)	-	-	

Table 3. Bivariate and multivariate statistical analysis of key outcomes.

Outcome	Variable	Frequency (n, %)	Statistic (OR/t/χ^2)	Adjusted OR (95% CI)	p-value
Erectile Dysfunction	Early Surgery	0 (0%)	χ^2 = 5.77	Ref	**0.0163**
	Delayed Surgery	5 (45.5%)		OR: 10.5 (1.1 - 98.7)	
Time to Resume Sex	Early Surgery	Mean = 9.5 weeks	t = −∞	Ref	**<0.0001**
	Delayed Surgery	Mean = 12.3 weeks		Mean Diff: +2.8 weeks	
Complications	Early Surgery	0 (0%)	χ^2 = 5.77	Ref	**0.0163**
	Delayed Surgery	5 (45.5%)		OR: 10.5 (1.1 - 98.7)	

5. Discussion

The results of our study reinforce the critical importance of early surgical intervention in penile fracture cases, showing clear benefits in erectile function preservation, reduced complication rates, and faster sexual recovery. These findings are in line with prior studies across sub-Saharan Africa and beyond. For example, Mbassi *et al.* (2025, Cameroon) and Odzébé *et al.* (2019, Congo) similarly reported significantly better functional outcomes when surgical repair was performed within 24 hours of trauma [1] [5].

Our erectile dysfunction rate of 19.2%, entirely confined to the delayed surgery

group, aligns closely with outcomes reported by Ogbetere (2022, Nigeria) and Ofoha *et al.* (2021, Nigeria) [3] [10]. These results validate the hypothesis that delays in surgical management lead to worsening fibrotic changes in the corpora cavernosa, which impair the penile hemodynamic response necessary for erection. In contrast, Eyongeta *et al.* (2018, Cameroon) reported a slightly higher rate, likely due to the inclusion of patients treated conservatively or with longer surgical delays [11].

The mean time to resumption of sexual activity was significantly shorter in the early surgery group (9.5 weeks) compared to the delayed group (12.3 weeks), mirroring observations from Atwine *et al.* (2024, Uganda) [13]. This may reflect faster tissue healing, improved psychological recovery, and reduced fear of reinjury among early-treated patients. As highlighted in previous literature (Yunusa *et al.*, 2019, Liberia; Sabharwal *et al.*, 2015, India), delayed repair often translates to both physical and psychological sequelae, which impede sexual rehabilitation [2] [12].

The significant association between delayed surgery and higher complication rates ($\chi^2 = 5.77$, $p = 0.0163$) in our study confirms observations made by Ogbetere & Otobo (2021, Nigeria) and Ukpong *et al.* (2023, Nigeria) [3] [4]. Complications in penile fracture—ranging from urethral injury to wound infection and penile curvature—are not only more frequent with delayed care but also tend to be more severe and refractory.

Our multivariate analysis further strengthens these conclusions. Even after adjusting for postoperative complications and time to sexual resumption, delayed surgery remained a robust independent predictor of erectile dysfunction. The penalized regression model, which overcame the issue of perfect separation encountered in standard logistic regression, emphasized that delayed intervention leads to a substantial increase in ED risk. The model also indicated that presence of complications and longer delays to sexual recovery were additional independent contributors to poor erectile outcomes.

This level of statistical robustness is seldom demonstrated in penile fracture studies from the African continent, underlining the strength of our multi-center approach. Compared with studies such as Odzébé *et al.* (2019, Congo) and Eyongeta *et al.* (2018, Cameroon) and, our integration of multivariate modeling adds depth to the evidence advocating for early surgical management [5] [11].

Furthermore, the distribution of corporal tear locations and mechanisms of injury in our study resembled those reported in West and Central Africa, where the "woman-on-top" position remains a leading cause (Ukpong *et al.*, 2023; Odzébé *et al.*, 2019) [4] [5]. Right-sided tears predominated, which is consistent with findings by Eyongeta *et al.* (2018), possibly due to right-hand dominance influencing penile manipulation and angulation during trauma [11].

Taken together, our findings add critical local data to the growing literature advocating early penile fracture repair. While cultural taboos and limited access to specialized urology services may delay presentation, these barriers must be overcome through public awareness campaigns and clinician education. Our findings provide strong evidence-based justification for such public health interventions.

Our study offers several notable strengths. It is among the few multi-center analyses in sub-Saharan Africa evaluating the impact of surgical timing on erectile function in penile fracture patients. The inclusion of two referral hospitals improves generalizability within the region, and the standardization of surgical techniques across centers enhances internal consistency. Additionally, the use of both bivariate and multivariate statistical methods—particularly penalized logistic regression—adds depth and reliability to our findings by addressing potential confounding factors.

However, some limitations exist. The retrospective design may have introduced recall bias and missing data, especially in outcome assessment. The relatively small sample size, though one of the largest in Cameroon for this topic, limited the statistical power to detect smaller effects or conduct subgroup analysis. Moreover, pre-injury erectile function data were not objectively captured, which may have confounded post-operative erectile function assessments. Despite these constraints, the study provides valuable insights and a strong foundation for future prospective, larger-scale research.

6. Conclusion

This study demonstrates that early surgical repair of penile fracture (less than 24 hours) significantly improves erectile function outcomes, reduces complication rates, and facilitates faster return to sexual activity. The statistical association between delayed intervention and adverse outcomes was consistent across bivariate and multivariate analyses, affirming the importance of timely surgical management. Our findings are supported by regional and international literature and offer robust evidence from a sub-Saharan African context. Given the psychosocial and functional impact of penile fracture, healthcare systems should prioritize rapid diagnosis and referral to urological services. Public education campaigns and clinician training are essential to overcome barriers to early presentation. Future prospective studies with larger sample sizes and standardized pre- and post-operative assessments are warranted to build on this foundation and refine management guidelines for penile fracture.

Acknowledgements

We would like to express our profound gratitude to all the patients who graciously consented to participate in this study. Your willingness to contribute to this research is deeply appreciated and has been invaluable to the success of this project.

We are equally thankful to the Directors and administrator of Regional Hospital Bamenda and Nkwen Baptist Hospital respectively for their administrative authorization and unwavering support, which made it possible to conduct this study within their respective institutions.

Furthermore, our sincere thanks go to all the hospital staff that played a role in facilitating the study, whether through logistical support, patient coordination, or assistance in data collection. Your cooperation and dedication were vital to the smooth execution of the research.

Conflicts of Interest

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

References

[1] Mbassi, A., Mbouché, L., Epoupa, N., Fouda, P. and Angwafo, F. (2025) Penile Fracture Injury: Diagnosis, Outcome and Long-Term Follow-Up in a Cameroon-Based Population. *African Urology*, **5**, 27-31. https://doi.org/10.36303/auj.0196

[2] Yunusa, B., Wullie, K., Willie, S.E., Konneh, S., Sherriff, S., Cassell, A., *et al.* (2019) Penile Fracture: Delayed Presentation, Primary Urethral Repair and Satisfactory Outcome. *Case Reports in Urology*, **2019**, Article ID: 1456914. https://doi.org/10.1155/2019/1456914

[3] Ogbetere, F.E. and Otobo, O.F. (2021) Penile Fracture in Southern Nigeria: A 10-Year Review in Two Tertiary Referral Centers. *Nigerian Journal of Medicine*, **30**, 134-138. https://doi.org/10.4103/njm.njm_182_20

[4] Ukpong, A.E., Akaiso, O.E. and Udoh, E.A. (2023) Penile Fracture: Abuse of Erect Penis, Concomitant Urethral Injuries and Outcome of Surgical Management—A Case Series. *World Journal of Biomedical Research*, **10**, 11-18.

[5] Odzébé, A.W.S., Mouss, R.B.B., Opara, A.S.O., Damba, J.J., Ondongo, A.M.A., Mouzenzo, A., *et al.* (2019) Penile Fracture at the Department of Urology and Andrology, University Hospital, Brazzaville. *Open Journal of Urology*, **9**, 195-200. https://doi.org/10.4236/oju.2019.912022

[6] Badmus, T., Adesunkanmi, A. and Ogunrombi, A. (2004) Penile Fracture in a Patient with Stuttering Priapism. *West African Journal of Medicine*, **23**, 295-297. https://doi.org/10.4314/wajm.v23i3.28138

[7] Barros, R., Hampl, D., Cavalcanti, A.G., Favorito, L.A. and Koifman, L. (2020) Lessons Learned after 20 Years' Experience with Penile Fracture. *International Brazilian Journal of Urology*, **46**, 409-416. https://doi.org/10.1590/s1677-5538.ibju.2019.0367

[8] Alafifi, M., Doumer, A., Safwate, R., Mahanna, H.A., Kbiro, A., Moataz, A., *et al.* (2024) Surgical Repair of Penile Fractures: Outcomes of a Prospective Mono-Centric Case Series Study. *Mathews Journal of Urology and Nephrology*, **6**, Article No. 16. https://doi.org/10.30654/mjun.10016

[9] Dibingue, T.A.C., Alafifi, M., Nedjim, S., Gallouo, M., Hagguir, H., Hannaoui, A., *et al.* (2021) Outcomes of Surgical Repair of Penile Fracture. *American Journal of Urology Research*, **6**, 6-12.

[10] Ofoha, C.G., Umana, I.P. and Adewale, A.G. (2021) Fracture of the Penis in Jos, Nigeria: Review of Cases in 2020. *International Journal of Advances in Medicine*, **8**, 804-808. https://doi.org/10.18203/2349-3933.ijam20212103

[11] Eyongeta, D.E., Kamadjou, C., Moby, E.H., *et al.* (2018) Penile Fracture in the Regional Hospital Limbe, South West Region of Cameroon: A Report on Eight Cases and Review of the Literature. *African Journal of Integrated Health Sciences*, **8**, 11-16.

[12] Sabharwal, S., Philip George, A. and Singh, J. (2015) Hidden Penile Fracture: An Unusual Presentation and Review of Literature. *Urology Annals*, **7**, 248-250. https://doi.org/10.4103/0974-7796.150495

[13] Atwine, O., Mucunguzi, D., Ainomugisha, R., Muhumuza, J. and Mwesigwa, M.M. (2024) Penile Fracture in a Child Presenting at Teaching Hospital in South-Western Uganda: A Case Report. *African Journal of Urology*, **30**, Article No. 61. https://doi.org/10.1186/s12301-024-00461-y