International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Website: https://ijmpr.in/

Original Article

Clinical Outcomes of Immediate Surgical Repair in Penile Fracture: A Tertiary Care Center Experience with Long-Term Complications

Dr Mohd. Shahzaib[1], Dr Naeem Ahmad[2], Dr Beera Krishnan[3], Dr Mustafa Ali[4], Dr Saurabh Bharati[5]

[1-5]Postgraduate Scholar, Department of Minimal Access & General Surgery, Govt. Medical College, Srinagar Jammu & Kashmir

OPEN ACCESS

Corresponding Author:

Dr Naeem Ahmad
Postgraduate Scholar, Department of Minimal Access & General Surgery, Govt. Medical College, Srinagar Jammu & Kashmir

Received: 14-03-2026
Accepted: 06-04-2026
Published: 27-04-2026

ABSTRACT

Background: Penile fracture is a true urological emergency resulting from rupture of the tunica albuginea. Immediate surgical repair is the gold standard; however, concerns remain regarding long-term complications such as erectile dysfunction (ED), penile curvature, and plaque formation.
Objective: To evaluate clinical presentation, intraoperative findings, and long-term functional outcomes following immediate surgical repair of penile fracture.
Methods: A retrospective observational study was conducted on 42 patients undergoing immediate surgical repair at GMC Srinagar. Clinical, operative, and follow-up data were analyzed. Erectile function was assessed using the IIEF-5 questionnaire.
Results: Mean age was 32.4±7.8 years. Sexual intercourse was the most common etiology (71.4%). Mean time to surgery was 10.6±5.2 hours. Unilateral injury occurred in 90.5% and urethral injury in 9.5%. At mean follow-up of 18.4 months, ED was observed in 14.3%, penile curvature in 9.5%, and plaque in 4.8%.
Conclusion: Immediate surgical repair results in favorable outcomes with low complication rates. Early intervention remains critical for optimal functional recovery.

Keywords: *Penile fracture; Immediate surgical repair; Erectile dysfunction; Tunica albuginea; Long-term outcomes.*

INTRODUCTION

Penile fracture is a rare but well-recognized urological emergency defined as rupture of the tunica albuginea of the corpus cavernosum during erection (1,2). During erection, the tunica albuginea thins from approximately 2 mm to 0.25–0.50 mm, making it highly vulnerable to rupture when exposed to sudden intracavernosal pressure (3). This mechanical vulnerability explains the occurrence of fracture following blunt trauma to an erect penis. Clinically, penile fracture presents with a characteristic triad of an audible cracking sound, sudden detumescence, and rapid penile swelling, often accompanied by ecchymosis producing the classic "eggplant deformity" (4,5). Additional findings such as penile deviation and blood at the urethral meatus may indicate associated urethral injury (6). Although uncommon, penile fracture has been documented historically across multiple cultures, and its incidence is estimated at approximately 1.02 per 100,000 males annually (7). However, the true incidence may be higher due to underreporting related to social stigma (8). The etiology varies geographically, with sexual intercourse being the predominant cause in Western populations, whereas penile manipulation practices are more frequently reported in certain Asian and Middle Eastern regions (9,10). Diagnosis is primarily clinical, with several studies demonstrating near-perfect diagnostic accuracy based on history and physical examination alone (11). Imaging modalities such as ultrasound and magnetic resonance imaging (MRI) are reserved for equivocal cases or for precise localization of the tunical defect (12). Management strategies have evolved significantly, and there is now strong evidence supporting immediate surgical repair as the gold standard treatment. Comparative studies and meta-analyses have demonstrated that surgical intervention results in significantly lower rates of erectile dysfunction, penile curvature, and plaque formation compared to conservative management (13–15). Recent research has focused on identifying predictors of long-term complications. Delayed surgical intervention, bilateral corporal involvement, and larger tunical defects have been shown to significantly increase the risk of erectile dysfunction (16,17). In particular, delays beyond 12–14 hours have been associated with poorer functional outcomes (16). Additionally, penile curvature has been identified as an independent predictor of long-term erectile dysfunction (18). Despite the availability of global data, there remains a paucity of region-specific studies from the Indian subcontinent, particularly from Kashmir. Therefore, this study aims to evaluate clinical

presentation, intraoperative findings, and long-term outcomes following immediate surgical repair of penile fracture in a tertiary care setting, while comparing these findings with existing literature.

OBJECTIVES

- To evaluate the clinical profile and presentations of patients with penile fracture at a tertiary care center (GMC, Srinagar).
- To assess the intraoperative findings and surgical outcomes of immediate surgical repair.
- To determine the incidence and nature of long-term complications including erectile dysfunction, penile curvature, palpable plaque, and voiding dysfunction.
- To identify potential predictors of post-operative complications.
- To compare our outcomes with published literature from regional and international centers.

Methodology

Study Design:

This was a retrospective observational study.

Study Setting:

Department of General Surgery, Government Medical College (GMC) and associated SMHS Hospital, Srinagar, Jammu & Kashmir, India.

Sample Size:

A total of 42 consecutive patients diagnosed with penile fracture and managed with immediate surgical repair were included.

Inclusion Criteria

- Male patients presenting with clinical features suggestive of penile fracture
- Diagnosis confirmed intraoperatively by identification of tunical tear
- Surgical repair performed within 24 hours of injury
- Minimum follow-up of 6 months

Exclusion Criteria

- Isolated rupture of superficial/deep dorsal vein
- Patients managed conservatively
- Pre-existing erectile dysfunction
- Patients lost to follow-up before 6 months

Data Collection

This retrospective study was conducted using data retrieved from hospital case records, operative notes, and follow-up records of patients diagnosed with penile fracture. A comprehensive dataset was compiled to ensure detailed evaluation of clinical and surgical outcomes. The variables recorded included patient demographics such as age and marital status, etiology and mechanism of injury, and relevant time intervals including duration from injury to hospital presentation and surgical intervention. In addition, clinical features at presentation, diagnostic investigations performed, intraoperative findings, details of the surgical technique, and post-operative outcomes were systematically documented. This structured data collection enabled a thorough assessment of both immediate and long-term outcomes associated with the management of penile fracture. All patients underwent prompt surgical exploration under either spinal or general anesthesia. In the majority of cases, a subcoronal circumferential degloving incision was employed to provide optimal exposure of the penile shaft. Following incision, evacuation of the hematoma was performed to clearly identify the site and extent of tunical rupture. The tunical tear was repaired using interrupted 3-0 polyglactin (Vicryl) sutures. In cases where a concomitant urethral injury was identified, repair was carried out using 4-0 polyglactin sutures over a Foley catheter to ensure urethral continuity and healing. A compressive dressing was applied at the conclusion of the procedure. Post-operative management included administration of antibiotics to prevent infection, and diazepam was prescribed to suppress erections during the early healing phase. Patients were also advised strict sexual abstinence for a period of 6–8 weeks.

Follow-up evaluation was conducted at regular intervals, specifically at 2 weeks, 6 weeks, 3 months, 6 months, and subsequently at 6-month intervals. During follow-up visits, patients underwent detailed local examination to assess wound healing and detect any complications. Particular attention was given to the presence of penile curvature or palpable plaque formation. Erectile function was evaluated using the International Index of Erectile Function-5 (IIEF-5) scoring system, allowing objective assessment of sexual outcomes. Voiding function was also assessed to identify any urinary complications, especially in patients with associated urethral injury. This systematic follow-up protocol facilitated comprehensive evaluation of both functional and anatomical outcomes over time.

Ethical Approval: The study was approved by the Institutional Ethics Committee of Government Medical College, Srinagar. Informed consent was obtained from all patients for the surgical procedure and for use of anonymized data for research purposes.

Statistical Analysis: Data were analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR), as appropriate. Categorical variables were expressed as frequencies and percentages. The Chi-square test or Fisher's exact test was used for comparison of categorical variables. A p-value < 0.05 was considered statistically significant.

RESULTS

A total of 42 patients diagnosed with penile fracture were included in the study. The demographic profile is summarized in Table 1. The mean age of patients was 32.4 ± 7.8 years, with an age range of 21–52 years. The majority of patients were married (85.7%), while a smaller proportion were unmarried (14.3%), indicating that penile fracture predominantly affected sexually active adult males.

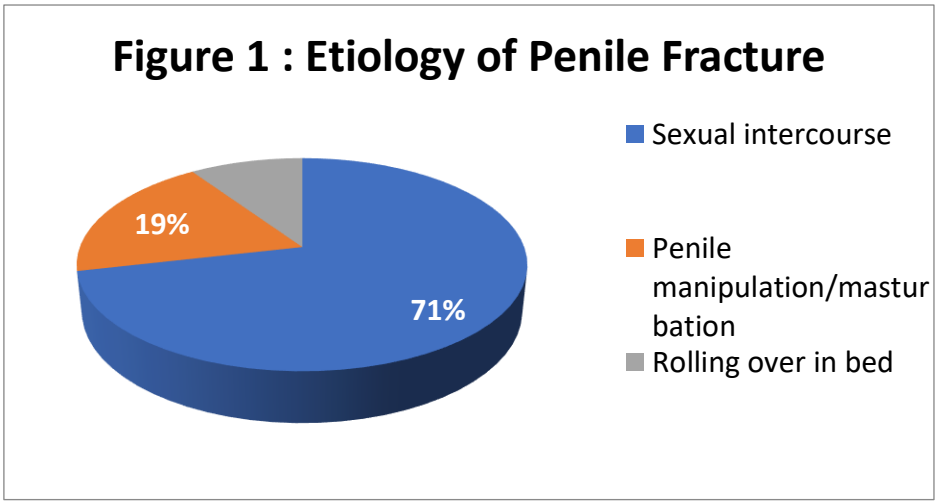
Table 1: Demographic and Clinical Characteristics (n = 42)

Parameter	Value
Mean age ± SD (years)	32.4 ± 7.8
Age range (years)	21–52
Married, n (%)	36 (85.7%)
Unmarried, n (%)	6 (14.3%)

The etiology of injury is detailed in Table 2 & Figure 1, where sexual intercourse emerged as the most common cause, accounting for 71.4% of cases. Other causes included penile manipulation or masturbation (19.1%) and rolling over in bed (9.5%).

Table 2: Etiology of Penile Fracture (n =42)

Etiology	(%)
Sexual intercourse	30 (71.4%)
Penile manipulation/masturbation	8 (19.1%)
Rolling over in bed	4 (9.5%)

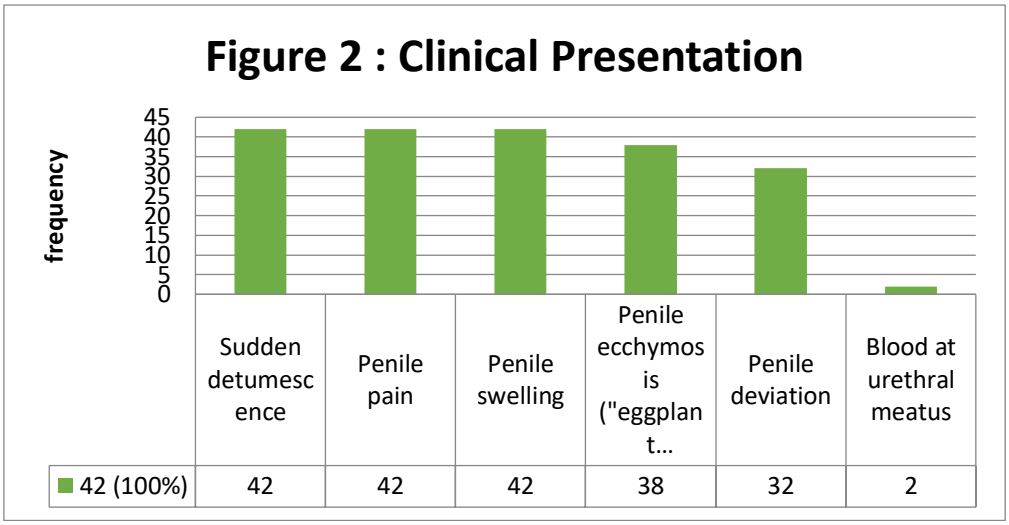


The clinical presentation of patients was consistent and characteristic, as shown in Table 3 &Figure 2. All patients (100%) reported a history of a cracking or popping sound at the time of injury, followed by sudden detumescence, penile pain, and swelling. Penile ecchymosis, commonly referred to as the “eggplant deformity,” was observed in 90.5% of cases, while penile deviation was noted in 76.2%. Blood at the urethral meatus, suggestive of possible urethral injury, was present in 9.5% of patients.

Table 3: Clinical Presentation (n =42)

Clinical Feature	n (%)
Cracking/popping sound	42 (100%)
Sudden detumescence	42 (100%)
Penile pain	42 (100%)
Penile swelling	42 (100%)
Penile ecchymosis ("eggplant deformity")	38 (90.5%)

Penile deviation	32 (76.2%)
Blood at urethral meatus	2 (9.5%)



The timing of surgical intervention is presented in Table 4. Most patients (42.8%) underwent surgery within 6–12 hours of injury, while 28.6% presented within 6 hours and an equal proportion between 12–24 hours. The mean time to surgery was 10.6 ± 5.2 hours.

Table 4: Time from Injury to Surgery (n = 42)

Time Interval	n (%)
< 6 hours	12 (28.6%)
6–12 hours	18 (42.8%)
12–24 hours	12 (28.6%)
Mean time to surgery ± SD (hours)	10.6 ± 5.2

Intraoperative findings are summarized in Table 5. The right corpus cavernosum was more frequently involved (57.1%) compared to the left (33.3%), with bilateral involvement seen in 9.5% of cases. The majority of tunical tears were located in the distal shaft (47.6%), followed by the mid-shaft (38.1%) and proximal shaft (14.3%). The mean size of the tunical defect was 15.8 ± 4.6 mm. Concomitant urethral injury was identified in 9.5% of patients.

Table 5: Intraoperative Findings (n = 42)

Finding	n (%)
Side of Injury	
Right corpus cavernosum	24 (57.1%)
Left corpus cavernosum	14 (33.3%)
Bilateral	4 (9.5%)
Distal shaft	20 (47.6%)
Mid shaft	16 (38.1%)
Proximal shaft	6 (14.3%)
Mean tunical defect size ± SD (mm)	15.8 ± 4.6
Concomitant urethral injury	4 (9.5%)

Surgical management details are provided in Table 6. A subcoronal degloving incision was the most commonly employed approach (85.7%), while a direct inguinoscrotal or penoscrotal incision was used in 14.3% of cases. Polyglactin 3-0 (Vicryl) was used as the suture material in all patients. The mean operative time was 48.5 ± 12.3 minutes, mean hospital stay was 3.2 ± 1.1 days, and all patients required urethral catheterization with a mean duration of 5.4 ± 3.8 days.

Table 6: Surgical Approach and Post-Operative Details (n = 42)

Parameter	Value
Subcoronal degloving incision, n (%)	36 (85.7%)
Direct inguinoscrotal/penoscrotal incision, n (%)	6 (14.3%)
Suture material used	Polyglactin 3-0 (Vicryl)
Mean operative time ± SD (minutes)	48.5 ± 12.3

Parameter	Value
Mean hospital stay ± SD (days)	3.2 ± 1.1
Urethral catheter placed, n (%)	42 (100%)
Mean catheter duration ± SD (days)	5.4 ± 3.8

Early postoperative outcomes are presented in Table 7 &Figure 3,. The majority of patients (81.0%) did not experience any early complications. Among those who did, minor complications included skin oedema (9.5%), superficial wound infection (4.8%), and wound hematoma (4.8%). Long-term outcomes at follow-up are summarized in Table 8. With a mean follow-up duration of 18.4 ± 8.6 months (range 6–36 months), most patients (85.7%) maintained normal erectile function, as assessed by IIEF-5 scores. Mild erectile dysfunction was observed in 9.5% of patients, while 4.8% had mild-to-moderate dysfunction; no cases of moderate-to-severe erectile dysfunction were reported. Additional complications included penile curvature (9.5%), palpable plaque (4.8%), and painful erection (4.8%), while no cases of voiding dysfunction were observed. These findings suggest that early surgical intervention is associated with favorable functional and clinical outcomes.

Table 7: Early Post-Operative Complications (n =42)

Complication	n (%)
Wound infection (superficial)	2 (4.8%)
Wound hematoma	2 (4.8%)
Skin oedema	4(9.5%)
No early complications	34 (81.0%)

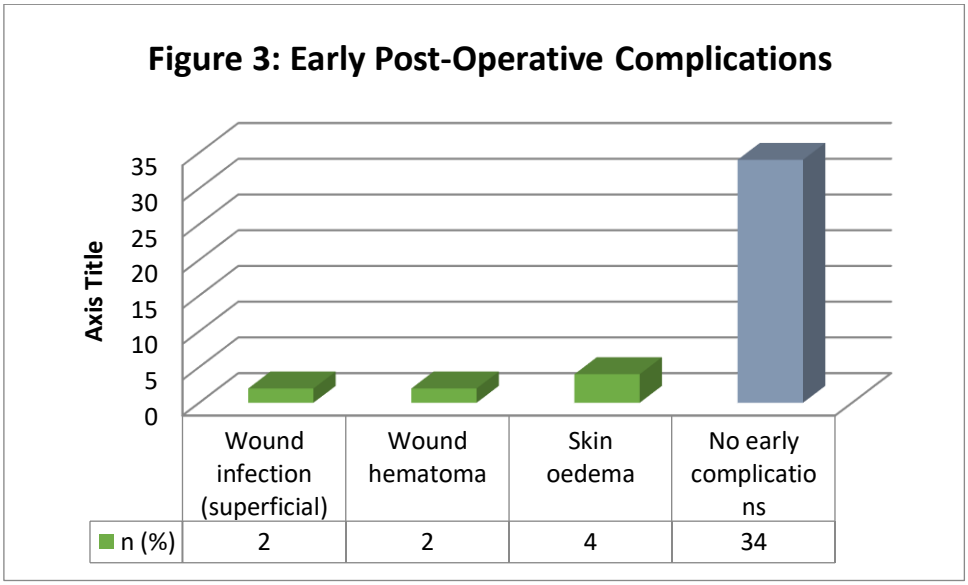


Table 8: Long-Term Complications at Follow-Up (n =42)

Complication	n (%)
Erectile Dysfunction (IIEF-5)	
No ED (IIEF-5 score 22–25)	36 (85.7%)
Mild ED (IIEF-5 score 17–21)	4 (9.5%)
Mild-to-moderate ED (IIEF-5 score 12–16)	2 (4.8%)
Moderate-Severe ED	0 (0%)
Penile curvature	4(9.5%)
Palpable plaque	2 (4.8%)
Painful erection	2 (4.8%)
Voiding dysfunction	0 (0%)
Mean follow-up ± SD (months)	18.4 ± 8.6
Follow-up range (months)	6–36

DISCUSSION

Penile fracture is an uncommon but important surgical emergency, and timely management is crucial in determining long-term outcomes. The present study provides insight into the clinical characteristics and outcomes of patients undergoing immediate surgical repair in a tertiary care center.

The mean age of patients in this study (32.4 years) is consistent with previously published literature, which shows peak incidence in the third to fourth decades of life (1,16,19). This reflects the increased sexual activity in this age group.

Sexual intercourse was the most common cause of penile fracture in this study (71.4%), which aligns with findings from Western studies (1,19). However, studies from other regions have reported higher rates of penile manipulation as a causative factor, highlighting cultural differences in etiology (9,10). These variations emphasize the importance of regional epidemiological data.

All patients in the present study exhibited classical clinical features, reinforcing the reliability of clinical diagnosis. This is consistent with previous studies reporting near 100% diagnostic accuracy based on clinical findings alone (11). Therefore, imaging should be reserved for atypical or uncertain cases.

Early surgical intervention is a key determinant of favorable outcomes. The mean time to surgery in this study was 10.6 hours, which is within the recommended window for optimal results. Previous studies have demonstrated that delays beyond 12–14 hours significantly increase the risk of erectile dysfunction (16,17). The relatively early intervention in this cohort likely contributed to the low complication rates observed.

The intraoperative findings in this study, including the predominance of unilateral injuries and distal shaft involvement, are consistent with existing literature (19,20). The incidence of urethral injury (9.5%) also falls within the reported range of 9–20%, underscoring the need for careful intraoperative evaluation (6).

The overall erectile dysfunction rate of 14.3% observed in this study is comparable to the rates reported in the literature for surgically managed cases (13–15). Importantly, all cases of erectile dysfunction were mild or mild-to-moderate, with no severe cases observed. This finding supports the effectiveness of early surgical repair in preserving erectile function.

Similarly, the rates of penile curvature (9.5%) and plaque formation (4.8%) were consistent with previously reported data (17,18). These complications are likely related to fibrosis during healing and may be influenced by factors such as tear size and timing of repair.

The subcoronal degloving incision used in the majority of cases provided excellent exposure and is widely regarded as the preferred surgical approach (20). The low rate of complications and absence of re-intervention further support its effectiveness.

Overall, the findings of this study are comparable with international data and reinforce the role of immediate surgical repair as the standard of care for penile fracture. Early diagnosis, prompt surgical intervention, and structured follow-up remain critical in achieving optimal outcomes.

CONCLUSION

Immediate surgical repair of penile fracture yields excellent functional and cosmetic outcomes, with a low incidence of long-term complications. Early intervention plays a critical role in preserving erectile function and preventing deformities such as penile curvature and plaque formation. The majority of patients in this study achieved satisfactory recovery, highlighting that timely diagnosis and prompt surgical management remain the cornerstone of optimal care.

Strengths of the Study

This study provides valuable region-specific data from a tertiary care center in Kashmir, contributing to the limited literature from the Indian subcontinent. The use of a uniform surgical approach and a standardized follow-up protocol, including objective assessment with the IIEF-5 questionnaire, enhances the reliability of the findings. Additionally, the study offers a comprehensive evaluation of clinical presentation, intraoperative findings, and long-term outcomes.

Limitations of the Study

The retrospective nature of the study introduces the possibility of selection and information bias. Being a single-center study, the findings may not be fully generalizable to other populations or healthcare settings. The relatively small sample size and the absence of a comparative group managed conservatively further limit the ability to draw broader conclusions

Conflict of interest: Nil

REFERENCES

1. Al-Ghazo MA et al. 2010. Immediate surgical repair of penile fracture: experience in 14 cases. *Int Surg*.
2. Kim MG et al. 2009. Long-term results of immediate surgical treatment of penile fracture. *Korean J Urol*. 50(2):165–168.
3. Farcaș C et al. 2015. Penile fracture – clinical case presentation. *Rom J Mil Med*. 118(3):9.
4. Al-Shaiji TF et al. 2009. Fractured penis: diagnosis and management. *J Sex Med*. 6(12):3231–3240.
5. McEleny K et al. 2006. Penile fracture. *Nat Clin Pract Urol*. 3(3):163–166.

6. El-Assmy A et al. 2010. Long-term outcome of surgical treatment of penile fracture complicated by urethral rupture. *J Sex Med*. 7(8):2858–2864.
7. Rodríguez D et al. 2019. Epidemiology of penile fractures in US emergency departments. *J Sex Med*. 16(2):248–256.
8. Masarani M et al. 2007. Penile fracture: diagnosis and management. *Trends Urol Gynaecol Sex Health*.
9. Rahman M et al. 2016. Penile manipulation: most common etiology. *J Family Med Prim Care*. 5(3):660–662.
10. Nawaz H et al. 2010. Penile fracture: presentation and management. *J Coll Physicians Surg Pak*. 20(5):331–334.
11. Ahmad S et al. 2011. Clinical diagnosis of penile fracture. *Pak J Surg*. 27(3):197–200.
12. De Luca F et al. 2017. Functional outcomes following immediate repair. *Scand J Urol*. 51(2):170–175.
13. Amer T et al. 2016. Penile fracture: a meta-analysis. *Urol Int*. 96(3):315–329.
14. Muentener M et al. 2004. Surgical vs conservative treatment. *J Urol*. 172(2):576–579.
15. Gamal WM et al. 2011. Long-term results of management. *J Trauma*. 71(2):491–493.
16. Şenel S et al. 2025. Long-term outcomes and predictors of ED. *Int J Impot Res*.
17. Bulbul E et al. 2021. Long-term complications after repair. *Andrology*. 10(2):337–342.
18. Altan M et al. 2022. Long-term complications and ED. *Rev Int Androl*. 20(3):167–172.
19. El-Bahnasawy MS et al. 2000. Immediate surgical intervention outcomes. *Int J Impot Res*. 12(5):273–277.
20. Pandher M et al. 2022. Presentation, management, and outcomes. *J Mens Health*. 18(11):215.