Lower Genitourinary Tract Trauma Caused by Cow Horn Injury

Vinod Priyadarshi¹ · Deepak Gupta¹ · Dilip Kumar Pal¹

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About the Author

Dr. Vinod Priyadarshi is a Senior Resident in the Department of Urology at IPGMER and SSKM Hospital, Kolkata. He has done his MBBS from Berhampur University, Orissa, and obtained Masters Degree in General Surgery from Patna University. He is awarded with MCh. Urology Degree from West Bengal University of Health Sciences. He has more than 25 national and international publications in indexed medical journals. He has keen interest in female urology and wide exposure in urogynecology; he has authored four such publications, two of which has been published in The Journal of Obstetrics and Gynecology of India.

Abstract

Introduction Lower genitourinary tract trauma in females caused by cow horn injury (goring) is rarely reported and discussed.

Materials and Methods All (12) women who were managed over the past 5 years for genitourinary tract trauma inflicted by cow horn injury were retrospectively analyzed.

Results Variable patterns of lower genitourinary trauma were observed due to cow horn injury.

Conclusion Treatment should be individualized and offered after thorough evaluation under anesthesia.

Keywords Cow horn injury · Bull gore injury · Lower genitourinary tract trauma · Female

Introduction

Non-obstetric injury to the lower genitourinary tract in females has not been well described in the literature [1]. The different causes of injury are coital injuries; astride injuries involving chairs, baths, toilet seats, central bar of boy's cycles; sports injuries, etc. [1–4]. Rarely, a cow horn or a bull goring may lead to vulvar and/or urethral injury and such incidence is scarcely reported [5]. We at our institution managed 12 women having lower genitourinary tract trauma caused by cow horn injury during the past

Dr. Vinod Priyadarshi is a Senior Resident in the Department of Urology at IPGMER and SSKM Hospital, Kolkata; Deepak Gupta is a Senior Resident in Department of Urology at IPGMER and SSKM Hospital, Kolkata; Dilip Kumar Pal is Professor and Head of the Department of Urology at IPGMER and SSKM Hospital, Kolkata.

✉ Vinod Priyadarshi
vinod_priyadarshi@yahoo.com

¹ Department of Urology, IPGMER and SSKM Hospital, Kolkata 700020, India

5 years. In this study, we tried to evaluate all these cases to determine the best way of management.

Materials and Methods

All the patients admitted in the department of urology for genitourinary trauma between August 2009 and July 2014 were scrutinized retrospectively for the search of lower genitourinary tract trauma in females caused by cow horn injury. A total of 12 such patients were found and were included in this study. Seven patients were admitted through emergency, 1 through outpatient department, while 4 patients were transferred in from gynecology department. Their injury, clinical presentation, management, and outcome were analyzed and discussed with the available literature.

Results

The age range of the patients was 10–50 years, with mean being 24.92 ± 23.94 years. Pain in the genital region with or without vaginal bleeding was the commonest symptom. Hematuria was present in 5 patients. Eight patients suffered from urinary retention. Four patients were brought in shock state due to hypovolemia and bleeding requiring immediate resuscitation. Six patients required blood transfusion.

All patients were examined in OT under general anesthesia (EUA) with good illumination. Culture swab from vulval wound was taken routinely before the examination. Digital rectal examination was performed in all cases. Initial investigations such as CBC and blood biochemistry were done immediately. In 7 patients, straight X-ray of the abdomen was required, and abdominal sonography was done in 6 patients. During EUA itself, cystoscopy was conducted in 5 patients who had suspected or obvious bladder or urethral trauma.

Vulva and the lower vagina were affected in all cases. Vulval hematoma was present in 7 cases. Upper vaginal lacerations and vault tear were seen in 2 and 1 patients, respectively. Two patients with small vulval hematoma needed only analgesics and antibiotics, while the other 5 women having large hematoma required evacuation and suturing. Thorough cleaning and debridement was done in case of contaminated or lacerated injuries. Only vaginal packing was sufficient to control bleeding in 2 patients, whereas rest of the patients required primary repair. Exploratory laparotomy was done in one patient who had penetrating injury through vagina.

Two patients had minor urethral abrasion. Distal urethral laceration was found in two patients, linear urethral

tear was found in one, and another one patient presented with urethral avulsion. Urethral abrasions required only cleaning and dressing. Clean urethral tear required immediate repair. Distal urethral lacerations were managed by debridement and neomeatus formation in one case, while other required suprapubic cystostomy followed by delayed urethral advancement. In one case, the detached urethra was repositioned under the pubis. Although perineal laceration was present in 2 patients, only one patient suffered from complete perineal tear and both were simply managed with primary repair (Table 1).

Out of 12 cases, majority (75 %) sustained injury caused by a cow and only 3 patients were injured by an angry bull. Three cases deserved special mention because of the extent of injury, diagnostic difficulty, and necessity for aggressive management.

The first case was a 39-year-old multiparous woman brought to the emergency with profuse bleeding from the genitalia. She was hit in the vulva by a cow while milking. On examination under anesthesia, the urethra, paraurethral tissue, and part of the vulval soft tissue were found completely detached from the under surface of symphysis pubis baring the bony pubis. However, cystoscopy revealed no urethral or urinary bladder injury. Hence, anatomical repositioning of the avulsed tissue along with urethra was done.

The second case was a 20-year-old recently married lady who presented in shock due to bleeding from vagina. She was picked up and thrown away by a wild bull with its horn piercing her vagina. The right-sided labia majora, minora, and right vaginal wall up to fornix were ragged, and a huge hematoma was found in the vulva and perineum. On USG, free fluid was detected in the peritoneal cavity. Urine was clear on catheterization, and cystoscopy revealed no bladder injury. Immediate laparotomy revealed no visceral injury, although peritoneal cavity was found to be communicated with vagina through the ruptured right fornix. Vulval hematoma was drained, and vulvovaginal injury was repaired. Later on, the patient developed dyspareunia, but a complete gynecological examination revealed no abnormality. A follow-up psychiatric consultation, counseling, and anti-anxiety medication were required to relieve her from dyspareunia.

The third case was a 28-year-old lady who presented with vaginal bleeding, pain, and acute retention of urine following cow horn injury of the lower genitalia. On pelvic examination under anesthesia, a 1.5-cm linear tear in distal urethra was found. Right-sided vagina and paraurethral region were bruised, and a hematoma was detected. Cystoscopy revealed no bladder injury. Primary repair of urethra was done after catheterization, and vulval hematoma was drained (Fig. 1).

Table 1 Clinical details of the 12 patients

Site and nature of lesion	No.	Management	No.
Vulva			
Hematoma	7	(a) Conservative	2
		(b) Evacuation and suturing	5
Laceration	8	Primary repair	8
Vagina			
Hematoma	4	Evacuation and suturing	4
Laceration	6	Primary repair	6
Vault tear	1	Repair	1
Perineum			
Hematoma	2	(a) Conservative	1
		(b) Evacuation and suturing	1
Laceration	2	Primary repair	2
Complete perineal tear	1	Repair	1
Urethra			
Minor abrasion	2	Cleansing and dressing	2
Laceration	2	(a) Debridement	1
		(b) Delayed repair	1
Tear	1	Primary repair	1
Avulsion	1	Reposition	1

Discussion

Lower genitourinary trauma resulting from cow horn injury may present as a continuum of severity from minor trauma to major vulvovaginal lacerations and multi-organ involvement [5]. The true incidence of such injuries is difficult to ascertain because of its rarity and under-reporting out of embarrassment and concealment of the facts [1, 4, 5]. Severe vaginal lacerations may result in life-

threatening blood loss and hemorrhagic or septic shock requiring resuscitation, blood transfusion, and prolonged hospitalization. It can lead to long-term morbidity because of inappropriate assessment, misdiagnosis, and inadequate treatment [6]. Our study emphasizes the need for multi-disciplinary approach involving urologists, gynecologists, and general and orthopedic surgeons.

This government hospital is situated in eastern India and attracts large population belonging to very poor socio-economic status. Most of the people are cultivators. Animal farming and milking of the domestic cattle is an important part of their profession. Mostly, women of this area are engaged in feeding and milking of the cattle. During the process of milking, they adopt squatting posture on the ground and are vulnerable to cow horn trauma of their lower genitourinary region. On history, it was revealed that most of the women sustained injury in early postpartum period of the cow when profuse milk is secreted by a delivered cow to feed their calf but is deprived by the owner. We came across to comparatively large number of this type of rare injury as our institution is the largest tertiary care center in this area.

The horns of a cow or a bull used to be long, curved forwards with smooth tapering ends that can produce lacerations and can also penetrate the body cavities. Goring occurs when horn penetrates deeply in the muscles or the body cavities leading to a single injury that includes a mix of lacerated wound, contusion, and infection. The patterns of injuries vary depending upon the height of the victim,

Fig. 1 Vulval hematoma following cow horn injury

the height of the bull, and relative position of the animal at the time of attack [7, 8]. Thus, such wounds developed out of horn impact vary from contusions, lacerations, and penetrating wounds involving internal organs to fractures. Such injuries can be inflicted at any part of the body but abdomen and chest are more commonly involved [8]. Injuries of the vulva and the vagina are rare, as the perineum is a highly protected region due to the reflex adduction of the thigh. The lacerations are usually limited to the lower vagina, as the horns are long curved and are directed forwards with tapering edges, but as the region is highly vascularised, always a significant hematoma or hemorrhage develops whenever such an impact occurs [5].

Perineum is a complex region where the visualization and access to various structures are very difficult. The simplicity of the external injury may hide the serious internal damage. Therefore, a careful and thorough examination, preferably under good illumination and anesthesia, is crucial in all cases of perineal injuries as diagnosis may not be straightforward. Severe associated urological, intestinal, and bony injuries may be caused by goring, and there is always a high probability of an infection. Hence, all such wounds should be thoroughly washed and debrided, and a meticulous speculum examination of vagina and digital rectal examination are mandatory to arrive at an accurate diagnosis [2, 4, 5].

Sloin et al. have described a management protocol for non-obstetric vaginal trauma and this should be applied in all such cases of vulval injuries due to cow horn [4]. Many cases may resolve with a minimal medical intervention, but the majority cases have severe lacerations, and require hospitalization and blood transfusion, while some may be fatal. Labial hematoma usually requires conservative management except when there is continuous bleeding [2]. Evacuation of hematoma along with suturing is the mainstay of management in the presence of bleeding from the wound. Antibiotic and analgesic are mandatory; blood transfusion is necessary in hypovolemic patients.

The repair of lacerations in this area needs a complete knowledge about the anatomy of the region and expert surgical skills. In the presence of hematuria, cystoscopic examination should be done to rule out the urinary tract injury. Whenever a genital injury is detected, a urethral or bladder injury should be excluded. Laparoscopy may be helpful wherever a visceral injury is suspected [4]. Complete perineal tear is rarely reported, and primary repair in layers is the mainstay of management in this type of injury if brought immediately or within 48 h [6]. These women deserve special counseling about the possible adverse consequences of trauma such as prolapse, incontinence, infertility, and dyspareunia [5, 6].

Superficial abrasion of urethra requires only conservative management. Actual urethral injuries in females are managed by either primary repair or initial suprapubic cystostomy and secondary repair [9, 10]. Rupture or transaction of proximal urethra is managed ideally through a transvaginal approach with debridement followed by end-to-end anastomosis over a stenting catheter and layered closure of overlying vaginal tissue [10]. Immediate primary repair or at least urethral realignment over a catheter avoids subsequent urethrovaginal fistulas or urethral obliteration [11]. Concomitant vaginal lacerations also must be closed acutely to prevent vaginal stenosis [12]. Deferred reconstruction with suprapubic cystostomy is an option when there is extensive traumatized tissue that precludes immediate ideal surgical repair. Delayed reconstruction is always difficult as female urethra is too short to be amenable for mobilization during an anastomotic repair when it becomes embedded in scar and invariably requires partial pubectomy for better exposure [13]. Laceration of distal urethra where continence mechanism is intact, neomeatus is formed by catheterization and closure of vaginal lining around the neomeatus. If not possible, delayed repair with urethral advancement and neomeatus formation is done [9–11]. Extensive injuries of lower genitourinary tract demand multidisciplinary approach.

Conclusion

Cow horn injury involving female lower genitourinary tract is extremely rare. Injuries may be variable extending from simple hematoma and abrasion to complex vaginal and perineal tear, urethral erosion, avulsion and laceration, and occasional bladder and rectal perforation depending upon the victims' position and the force and site of the impact. Treatment should be individualized and often requires a multidisciplinary approach.

Author contribution All authors hereby declare that they have participated sufficiently in the intellectual content, conception, and design of this work, and have approved the final draft and agreed to have their names listed as an author.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical approval According to our institutional protocol, ethical committee clearance is not required for the retrospective observational and analytic studies. As the present study is a retrospective analytical study, institutional ethical committee clearance is not obtained.

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