

Clinico-epidemiological and Outcome Analysis of Anogenital Injuries in Children: Retrospective Study from a Tertiary Care Centre, Central India

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ABSTRACT

Introduction: Paediatric perineal trauma or Anogenital Injury (AGI) in the paediatric age group remains lesser reported in under-developed areas or rural areas of India. Most of these injuries remain under reported to tertiary care centres because of a social stigma or poor access to a health facility.

Aim: To present the clinico-epidemiological parameters of AGI in children and to assess the outcome of staged and definitive management in these children, comparing the results with other similar studies.

Materials and Methods: This was a retrospective study on data of 11 cases (age range 1-14 years, seven cases were boys and 4 cases were girls) of paediatric anogenital injuries, admitted at the tertiary care centre from 1st July 2018 to 30th June 2020 were analysed. Data of all the patients, demographic details, relevant clinical history such as time of presentation, mode of injury and type of management, outcomes and complications was collected and studied. All the collected data was analysed by calculating mean±SD, frequency (n) and percentages (%).

Results: Road traffic accident was the most common cause of AGI (n=5, 45.5%), followed by sexual assault (n=3, 27.3%). Wound infection in late presenters (n=5, 45.5%) was the most common complication affecting the outcome. Children with a primary diversion of the faecal stream or diversion colostomy (n=5, 45.5%) as an associated procedure had a better outcome. Primary repair without diversion (n=3, 27.3%) was noticed to have a high incidence of wound infection and anovaginal scarring.

Conclusion: A high incidence of poor wound healing related to late presentation and malnutrition noted among these AGI cases belonging to rural or semi-urban settings. Management of these injuries, therefore, needs to be individualised on case-to-case basis. The diversion stoma formation seems to be considered in all high grade anogenital injuries and selected lower grade injuries with evidence of secondary infection or poor healing of the primary repair.

Keywords: Colostomy, Faecal diversion, Malnutrition, Perineal injury

INTRODUCTION

The AGI in children is a rare condition and often under-reported. Many children with anogenital injuries do not report to tertiary care centers, and hence the exact prevalence of these injuries is not known in India. However, worldwide reported incidence is 6-8% [1,2]. Globally, apart from accidents, a significant number of children sustain injuries by abuse or battering [2]. Paediatric genital injuries represented 0.6% of all paediatric injuries in the United States [3].

In the Indian scenario, especially in semi-urban or rural areas, due to attached stigma and fear of medico-legal issues, a history of abuse is often concealed. So, pinpointing the exact cause of injury by gross examination is often a challenge to treating surgeons. The disease burden due to trauma is exponentially rising globally. As predicted by World Health Organisation (WHO), it may become the third leading cause of global disease burden by end of 2020 [4]. The incidence of accidents or assaults in children involving the anogenital area with complex injuries is also increasing [5]. Increasing numbers of perineal trauma cases are also contributed by unsafe transport practices causing road traffic accidents [6].

Anogenital injuries present with a spectrum depending upon the severity of the injury and long term morbidity. It may be a simple abrasion or contusion or small laceration affecting soft tissue superficially at the one end to extensive tears of the vulvo-vaginal and anorectal region at the other [7]. Management depends on the severity and needs to be individualised depending on the degree and precise anatomic details of the injury, time of presentation, and available expertise [8,9]. The primary repair of the sphincter and perineum can be considered if there is the absence of shock, no associated grievous injuries, or no faecal contamination of the

wound [9]. The decision of colostomy is the most important step in the presence of rectal injury with gross soiling [8].

The epidemiological data on paediatric anogenital injuries in Indian rural population is still missing in available literature. To the best of our knowledge, no paediatric surgical centre from central India has reported the data on paediatric anogenital trauma cases till date. This study evaluated the patients with anogenital injuries on various clinico-epidemiological parameters and assessed their outcome.

MATERIALS AND METHODS

This was a retrospective study conducted on data of patients who were diagnosed of perineal trauma and admitted to the Paediatric Surgery Department at Gajra Raja Medical College, Gwalior, India, from 1st July 2018 to 30th June 2020. Out of 50 cases of paediatric trauma, 11 children were admitted for the management of anogenital trauma.

Inclusion criteria: Data of the paediatric trauma patients aged 1 to 14 years, with perineal injury with or without polytrauma who were admitted to the Paediatric Surgery Department of the study centre during the study time period. Onen's classification was used to categorise the perineal injuries [Table/Fig-1] [7].

Exclusion criteria: Pediatric perineal injury patients with blunt trauma chest, blunt trauma abdomen and head injury were excluded from record.

Study Procedure

In all these patients, data were collected for demographic initial parameters, time of presentation, mechanism of injury, degree of injury, associated injuries, treatment received, and complications, haemodynamic stabilisation and optimal treatment of associated

GIS	Extant of injury
I	Isolated genital laceration below hymen or limited to penile/scrotal skin
II	Isolated genital laceration including hymen or tunica dartos of scrotum/Bucks fascia of penis
III	Isolated genital laceration including vagina or testis/penile cavernous or distal urethra
IV	GIS II or III injury plus partial tear of anorectum
V	GIS III injury plus complete tear of anorectum

[Table/Fig-1]: Onen's classification [7] for paediatric anogenital injuries- GIS (Genital injury score).

injuries, if any was given. Local wound care, saline wound irrigation, intravenous antibiotic, and analgesics were given along with physiological resuscitation. Careful in-dwelling urinary catheterisation was attempted in each patient. Primary repair or delayed repair with or without foecal diversion was performed depending upon the degree of injury and local wound condition.

STATISTICAL ANALYSIS

Results of all parameters were analysed using percentages and descriptive details.

RESULTS

This study included a total of 11 cases, summarised in [Table/Fig-2,3]. Seven cases were male, and four cases were females. The age ranged from 1 year to 14 years, mean age of presentation was 6.18 years [Table/Fig-2]. The mean time lapse between injury and reporting to the hospital was 27.27 hours (ranging from 12 hours to 48 hours). Out of 11 cases, the major number of children (9) weighted below the 5th percentile of weight for age. The majority belonged to

Parameters (N=11)	Results	Percentage (%)
Mean age at presentation (years)	6.18	-
Male: Female	7: 4	63.6:36.3
Mean duration/delay at presentation (hours)	27.27	-
Mean weight (kg)	14.09	
Number of cases having weight below 5 th percentile in growth chart (weight for age) suggestive of malnutrition	9	81.8
Number of cases belonging to lower socio-economic status (class V, score <5)	10	90.9
Mean follow-up time (months)	6.09	
Symptoms at presentation		
Pain in perineal region	11	100
Haematuria	2	18.2
Faecal incontinence	6	54.5
Anogenital bleeding	5	45.5
Abdominal symptoms	2	18.2
Mode of injury		
Sexual assault	3	27.3
Road traffic trauma	5	45.5
Fall on object	2	18.2
Dog bite	1	9.1
Organ involved in injury		
Perineal body	5	45.5
Anus	8	72.7
Rectum	5	45.5
Vestibule	4	36.4
Vagina	4	36.4
Hymen	4	36.4
Penis/scrotum	2	18.2
Urethra	1	9.1

[Table/Fig-2]: Clinico-epidemiological data of Ano genital injuries.

Cases managed (n=10)	Results	Percentage (%)
Conservative (observation)	2	20
Primary repair with covering colostomy	4	40
Primary repair without covering colostomy	3	30
Diversion colostomy and delayed repair	1	10
Outcome		
No complication	4	36.36
Faecal incontinence	1	9.09
Urine incontinence	1	9.09
Anal stenosis	1	9.09
Vaginal stenosis	2	18.18
Mortality	1	9.09
Secondary wound infection	5	45.45

[Table/Fig-3]: Management and outcome. (n=10 in managed cases since one mortality occurred during treatment)

lower (class V, Score <5) socioeconomic status according to the Modified Kuppaswamy scale [Table/Fig-2] [10].

The clinical history of all subjects with differential mode of injuries and their severity grades are provided in [Table/Fig-3]. All patients presented with pain as a primary symptom. Two cases had haematuria, and five cases had bleeding from the perineal wound. The majority of cases (six out of 11) patients had a loss of stool control and lower abdominal pain. Out of 11 cases, about half of the cases (45.5%) were road traffic accident victims, while three cases sustained a perineal injury by sexual assault.

The anal area was involved in a maximum number of cases (72.8%), while the rectum and perineal body were involved in 45.5% of cases. Out of 11 cases, 36.4% (n=4, females) had injuries involving the vestibule, hymen, and vaginal region. Out of 11 cases, 18.2% (n=2, male) had an injury in the scrotal region, and one male had an injury in the urethra [Table/Fig-3].

Out of 11 patients, seven cases underwent examination under anaesthesia. Two cases were managed expectantly. Faecal diversion by colostomy was done along with repair of the perineal wound in 4 cases (36.4%). In 3 (27.3%) cases, the primary repair was done without colostomy, and in one case, colostomy and delayed repair was done [Table/Fig-3].

In 4 cases (40%), there was no complication after repair. Faecal incontinence, urinary incontinence, and anal stenosis developed as a complication one case each. Vaginal stenosis occurred in two as complications after repair. Secondary wound infection developed in 5 (45.5%), and there was one mortality [Table/Fig-3]. The mean follow-up time was 6.09 months [Table/Fig-2].

DISCUSSION

Perineal injuries can exhibit as a spectrum, from superficial abrasion or lacerations of the labia or peno-scrotal skin to critical injuries that disrupt the anal sphincter and genitourinary system [11]. Management of AGI in children needs to be individualised. In the present retrospective study, two cases of anal assault sustained only minor anogenital abrasion, and one case of scroto-perineal laceration caused by a road traffic accident had grade I GIS. Another case of a dog bite injury with major scrotal laceration sustained grade II GIS. All other patients of the case series were of complex and higher grade anogenital trauma.

Sometimes perineal traumas are accompanied by injury to other organ structures like fracture pelvis and visceral organs. In such situations, prompt intervention for those life threatening injuries is prioritised over primary perineal wound repair [12]. Also, in this series, single mortality was caused by massive blood loss due to the associated pelvic fracture and head injury, along with perineal injury.

In the present study, a majority of anogenital injuries were caused by road traffic accidents, and the second most common cause was

Patient no.	Age	Sex	Mode of injury and severity of AGI	Onen's grading (GIS)	Surgical management done	Postoperative results and complications
1	3 years	Male	Sodomy victim, minor perianal abrasions	Grade I	Conservative management	No complication
2	2 years	Male	Sodomy victim, minor perianal abrasions	Grade I	Conservative management	No complication
3	12 years	Female	Straddle injury to hymen vestibule vagina and urethra, delayed presentation (after 24 hours of injury)	Grade III	Primary repair	Minor wound infection, mild urine incontinence in early postoperative (improved spontaneously), vaginal stenosis in postoperative – managed by vaginal dilatation
4	3 years	Male	Anorectal tear due to RTA, presented after 24 hours of injury with faecal incontinence and wound infection	Grade IV	Sigmoid Colostomy with primary repair	Minor anal stenosis in postoperative with good continence – managed by anal dilatation
5	4 years	Female	sexual assault victim with complete tear of perianal boy, anorectum extending to vagina, presented after 36 hours of injury	Grade V	EUA with colostomy in first stage of surgery, followed by delayed repair of Anogenital tear in second stage and colostomy closure in follow-up	Presented with wound infection. Outcome was Good continence, good anal and vaginal patency
6	1 years	Female	Straddle injury presented 12 hours after injury with tear of anorectum, perineal body extending to vagina	Grade V	EUA with colostomy and primary repair in first stage of surgery, colostomy closure in second stage	Good continence, mild vaginal stenosis
7	3 years	Female	RTA presented after 12 hours of injury with complete perineal body and anorectum tear extending to vagina	Grade V	EUA with colostomy and primary repair in first stage of surgery, colostomy closure in second stage	Good continence, mild wound infection and in scarring in post-operative
8	14 years	Male	RTA victim presented with hematuria, fracture pelvis, anorectal tear with faecal incontinence	Grade V	EUA with colostomy, supra-pubic cystostomy and primary anorectal repair in first stage of surgery, colostomy closure in second stage	Mild fecal incontinence in follow-up – improving spontaneously with perineal exercise
9	12 years	Male	scrotal laceration due to dog bite tearing dart-ose and exposed testis	Grade II	Primary repair	No complication
10	2 years	Male	scrotal laceration due to RTA	Grade I	Primary repair	No complication
11	12 years	Male	RTA victim presented with polytrauma, fracture pelvis, anorectal tear with faecal incontinence	Grade V	EUA with diversion sigmoid colostomy and wound cleaning	Patient died in early post operative period

[Table/Fig-4]: Details of individual cases of AGI.

AGI: Anogenital injury; RTA: Road traffic accident; EUA: Examination under anaesthesia; GIS: Genital injury scale

GIS	Sexual assault	Road traffic trauma	Fall on object	Dog bite
I	2	1	-	-
II	-	-	-	1
III	-	-	1	-
IV	-	1	-	-
V	1	3	1	-

[Table/Fig-5]: Grade of injuries within each type of trauma.

sexual assault. Based on the severity of AGI grading, most of the high-grade injuries caused by a road traffic accident. This was followed by sexual assault as the second most common cause [Table/Fig-4,5].

In this retrospective study, low socioeconomic status was observed with two major modes of anogenital trauma, the road traffic accident, and the sexual assault. The low socioeconomic status of an area or an individual appears to increase the risk of being injured in road traffic accidents [13]. A research on sexual abuse victim adolescents explained that family structure was significantly associated with sexual assault [14].

The poor nutritional status or malnutrition of a trauma victim child also adds to the morbidity of anogenital trauma, as it severely affects the wound healing status of the patient [15]. In the present study as well, most of the cases are affected by malnutrition as 90.9% cases weighted 5th percentile. A delay of more than 24 hours was also noticed in the presentation of these cases, resulting in infected and grossly contaminated wounds. This delay appears to be indirectly related to low socioeconomic status because of the lack of awareness of the intensity of injury and lack of early access to a health facility [16].

In this study, the parents of a sexual abuse victim female child (case number 5 in [Table/Fig-4]), tried to conceal the actual history of sexual abuse. In the first instance, parents gave the history of fall from the height. This highlights the stigma and fear

of medico-legal issues associated with such types of injuries in some underdeveloped society. After examination under general anaesthesia, the history was re-evaluated, and parents had re-interviewed to give true history. Subsequently, the actual history of sexual abuse was revealed by some relative. Detailed and correct history along with a comprehensive physical examination is a critical part of the management. The extraction of history becomes a challenging task in paediatric anogenital trauma cases and more so in cases of sexual assault when the victim is of young age or mentally traumatised. Out of three cases of sexual assault (case number 1, 2 and 5 of [Table/Fig-4]), history was given by parents, as all victims were minor. Out of these three cases, two cases gave suspicious history initially, probably out of fear or to cover the culprit who was their family members. Such social stigma appears to be more prevalent in this semi-urban or rural population.

At times, radiological modalities may be insufficient in assessing the actual extent of tissue damage in severe trauma cases. In such cases, a diagnostic endoscopic examination under anaesthesia is relevant to fully discern the anatomy of the injury [17]. In the present study, examination under anaesthesia was required in the majority of cases to fully ascertain the anatomical extent of AGI before repair. Timely diagnosis and prompt surgical reconstruction of an anogenital trauma give the best outcome [17].

Accidental AGI often happens from an impact to the groin or straddles trauma. In boys, penoscrotal traumatic wounds are frequently caused by accidents, while anal injuries are prevalent in sexual abuse. In female child victims, wounds to the perineum are prevalent following accidental traumas, while hymen, posterior fourchette, or labial injuries are more prevalent following sexual assault [12]. A complete knowledge of injured tissues can be helpful to aid in the differential diagnosis of the cause of anogenital injuries if history is doubtful. Determining the appropriate injury classification helps to define an appropriate treatment approach,

and the Genital injury score (GIS scale) is very useful for choosing the approach for an injury [7]. It is of optimum importance to select the type of management, depending on the location of the injury and involved organs or tissues. Occult injuries may not be evident during the primary clinical assessment. The endoscopic evaluation like rectoscopy, cystoscopy, or vaginoscopy can be performed in cases of major perineal traumas as and when required in a female child [18]. In the present study, however, the endoscopic evaluation was not required in any patient.

It is preferable to examine a child under general anaesthesia, which renders added diagnostic or therapeutic means to be employed if required during the single sitting. The “conscious” sedation can be inefficient due to the lack of an analgesic effect of various sedatives [19]. All patients of this case series having grade III-V, were examined under general anaesthesia, a surgical procedure was done in the same sitting. In the case of a 3-year-old female child (case number 5 in [Table/Fig-4]), a sexual assault victim, the examination under anaesthesia revealed extended anorectovaginal tear [Table/Fig-6] with the incomplete suturing done in a peripheral hospital one day back. The wound was grossly contaminated and infected. For this case, diversion colostomy was done, and the definitive repair through anterior sagittal approach was performed after three months of diversion colostomy [Table/Fig-7]. After four months of definitive repair, the anal continence was good, vaginal patency was satisfactory [Table/Fig-8] and colostomy closure was done.

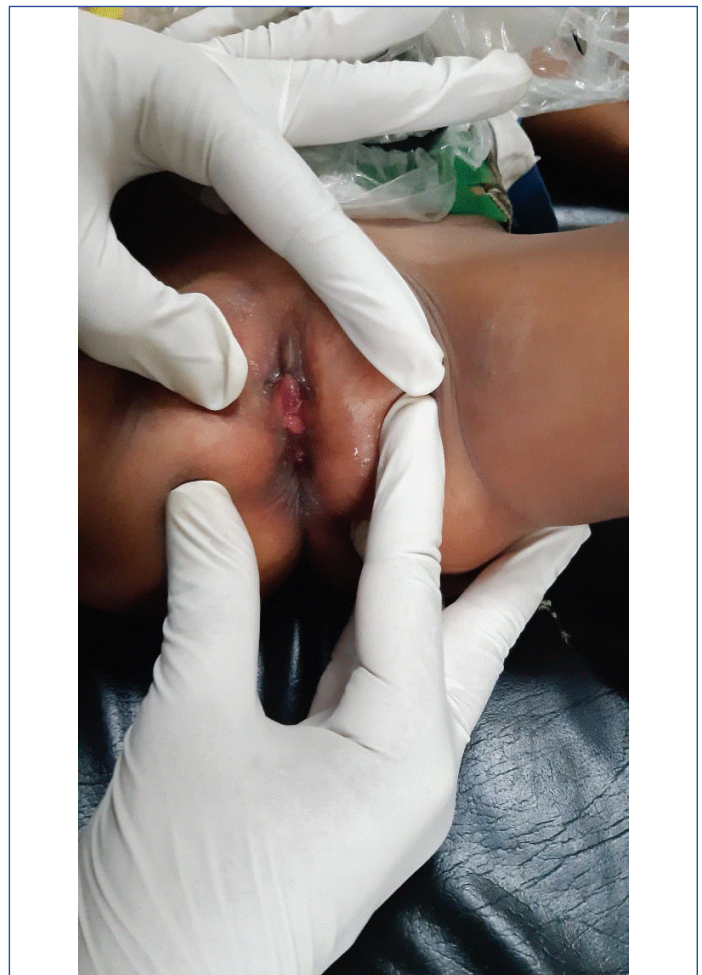


[Table/Fig-6]: The perineal tear involving anus and vagina in victim child of sexual assault.

The vaginal trauma patient of this case series (case number 3 of [Table/Fig-4]), on whom, the primary repair of the wound was done, encountered many complications like secondary wound infection, fibrosis, and narrowing of common urethrovaginal opening requiring repeated dilatation. A thorough exploration of rectal injuries is customary in the management of these cases. The traditional therapeutic strategies recommend faecal diversion in severe anorectal injury patients, comprising a diverting colostomy, cleaning of the perineal wound with rectal irrigation [20,21]. However, in recent years there are plenty of studies supporting primary reconstruction in patients with non severe injury, and selective faecal diversion reserved for patients with haemodynamic instability, profuse bleeding, damage to abdominal organs associated with colon injury [22-24]. But in the geographical areas having a poor and rural population like the present study, there are some important factors to consider for faecal diversion as a safe initial procedure in lower grade AGI involving anorectum. These factors are delays in presentation, grossly infected wounds, and poor nutritional status of patients, as apparent from the present retrospective study.



[Table/Fig-7]: The perineal repair of anus and vagina along with diversion colostomy in same victim child of sexual assault.



[Table/Fig-8]: The postoperative pic of anogenital region taken at six months of follow-up of same patient.

Limitation(s)

The study was a retrospective observational study, so recommendation of any management strategy cannot be claimed.

CONCLUSION(S)

It seems a safe practice to perform faecal diversion, not only in grade III to V anogenital injuries, but also in lower grade injuries having wound

contamination, late presentation, and other systemic morbidities like malnutrition which may affect healing. In the current scenario, there is also an urgent need to provide community education in schools and different organisations regarding the safety of children at home and outside. A large scale case control study is recommended in future to investigate about the benefits of staged procedure of diversion colostomy in this subset of population.

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PLAGIARISM CHECKING METHODS: [\(Jan H et al.\)](#)

- Plagiarism X-checker: Oct 20, 2020
- Manual Googling: May 20, 2021
- iThenticate Software: Jun 03, 2021 (6%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Oct 19, 2020**

Date of Peer Review: **Dec 17, 2020**

Date of Acceptance: **May 21, 2021**

Date of Publishing: **Aug 01, 2021**