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## CLINICAL ARTICLE

## Treatment of rape-induced urogenital and lower gastrointestinal lesions among girls aged 5 years or younger

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## ABSTRACT

**Objective:** To evaluate outcomes after treatment of rape-induced urogenital and lower gastrointestinal lesions among young girls. **Methods:** In a retrospective study, data were assessed from girls aged 5 years or younger who were treated for sexual-assault-related injuries at the General Referral Hospital, Panzi, Bukavu, Democratic Republic of Congo, between 2004 and 2014. Data were obtained from review of charts, records of the mother's impressions and physical examinations, and photographic evidence. Elective surgery had been reserved for patients experiencing fecal and/or urinary incontinence. **Results:** Overall, 205 girls aged 5 years or younger presented with rape injuries: 162 (79.1%) had only mucocutaneous lesions, 22 (10.7%) had musculocutaneous lesions, and 21 (10.2%) had musculocutaneous lesions complicated by fecal and/or urinary incontinence. Among the 21 girls who underwent perineal surgery, two with fecal and urinary incontinence and perforation of the peritoneum of Douglas pouch were additionally treated by laparoscopy. Among 16 patients with fecal incontinence, the continence score had improved significantly at 10.4 months after surgery ( $P < 0.001$ ). Concomitant urinary incontinence subsided for four of five patients but persisted for one who had a gunshot wound to the vagina. Cosmetic outcome was normal in 19 cases. **Conclusion:** For rape survivors aged 5 years or younger, a treatment strategy by which surgery is reserved for incontinent patients provided good cosmetic and functional outcomes.

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## 1. Introduction

The prevalence of sexual crime in the east of the Democratic Republic of Congo is related to the armed conflicts in the region. In these conflicts, rape is often used as a weapon. The high prevalence of sexual crimes signifies a systematic violation of fundamental individual human rights and creates a climate of impunity [1]. Child rape is defined as forced vaginal, anal, or oral penetration perpetrated on a child, whether or not genital lesions are thereby induced [2]. The prevalence is mostly unknown because of difficulties in reporting the cases and collecting data [3].

Conservative treatment is the widely recommended approach for superficial rape-induced lesions in children [4]. However, in the case of more substantial lesions, a treatment strategy including surgery is controversial [5].

The aim of the present study was to evaluate the outcome of treatment of genitourinary and lower gastrointestinal lesions among rape survivors aged 5 years or younger who attended the Panzi Hospital

Général de Référence (HGRP), Bukavu, South Kivu, Democratic Republic of Congo.

## 2. Materials and method

In a retrospective study, data were assessed from consecutive girls aged 5 years or younger who were treated for sexual-assault-related injuries at the HGRP between January 1, 2004, and December 31, 2014. The study was approved by the ethical committee of the Catholic University of Bukavu (identification number UCB/CIE/10B/2014). All participants' legal representatives had given written consent for treatment and data collection.

The data recorded for each patient at presentation were age and sex, site of the crime (home or outside the home), and characteristics of the rapist (civilian or military, family acquaintance or not, and individual or multiple assailants). Fecal and/or urinary incontinence was assessed. The perineal lesions were described in medicolegal terms and classified as follows: mucocutaneous lesion; muscular disruption, including (or not) the sphincters; and the presence or absence of macroscopic blood.

All patients benefitted from supportive psychotherapy. Initial medical treatment included a sitz bath in potassium permanganate solution, and tetanus and hepatitis B vaccination. Patients who sought medical help within 72 hours of the rape were treated using a postexposure

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prophylaxis kit (Zidolam, GlaxoSmithKline). Patients presenting with isolated mucocutaneous lesions were discharged after assessment, whereas those with muscular lesions were hospitalized until they showed full recovery.

Patients affected by fecal and/or urinary incontinence were re-evaluated under general anesthesia after the emergency treatment was completed. Re-exploration under anesthesia was performed with parental consent, and aimed to fulfill the medicolegal description of the lesions and confirm an indication for surgical exploration. Photographic evidence of the perineal lesions was requested in all cases. Surgical intervention was delayed until signs of infection had subsided and the perineal lesions had macroscopically healed.

For surgical repair of the injuries, general anesthesia was used and the patient was placed on the operating table in a gynecologic position. The hymenal carunculae were snapped by two Allis clamps, and outwards traction was applied. The tissue immediately posterior to the dorsal mucosa of the vagina was incised horizontally under traction. The plane between the posterior vaginal mucosa and the anterior side of the anal canal, corresponding to the lacerated rectovaginal septum, was dissected from a superficial to deep level, until the apex of the anal canal laceration was exposed. The two retracted ends of the external anal sphincter were identified and skeletonized. The anal canal was repaired from the apex of the laceration down to the anal skin using separate stitches of Vicryl 2/0. The two ends of the severed external sphincter were approximated by two U stitches of Vicryl 2/0. The lacerated superficial perineal muscles were sutured by a few separate stitches of Vicryl 2/0. The posterior vaginal mucosa was reconstructed by separate stitches of Vicryl 3/0, starting at the apex of the laceration going superficially. The hymen was subsequently reconstructed by separate stitches of Vicryl 3/0. The skin of the posterior commissure (fourchette) was closed by separate Lembert sutures of Vicryl 2/0. Colostomy was performed selectively.

When urinary incontinence was suspected, a Foley catheter was inserted. Patients affected by both urinary incontinence and fecal incontinence underwent urethral repair after placement of a Foley catheter. The anterior vaginal mucosa flap was dissected from the urethral canal, and the urethral mucosa was repaired by separate stitches of Vicryl 3/0. The suburethral muscles were identified and sutured by U stitches of Vicryl 3/0. The anterior vaginal mucosa was repaired by separate stitches of Vicryl 3/0. The Foley catheter was kept in place for an additional 14 days. Patients who presented with laceration of Douglas pouch underwent laparoscopic exploration using a 4-mm, 70° cystoscope (Hopkins II, Karl Storz, Tuttlingen, Germany).

For the present descriptive study, the duration between treatment initiation and surgical procedure, operative time, blood loss, perioperative and postoperative complications, and hospital stay were evaluated. The cosmetic outcome was evaluated by the authors on the basis of photographic evidence, and staged as normal or abnormal depending on the absence or presence of a cicatricial deformity.

For all patients, fecal incontinence was assessed before and after surgery by the mother and staged according to Kelly's classification [6]. Urinary incontinence was assessed by the mother on the basis of soiling of the child's underwear, before and after surgery. At conclusion of treatment, mothers rated their satisfaction on a scale of 1 to 5, with 1 indicating "very dissatisfied" and 5 indicating "very pleased."

The study data were statistically assessed with SAS version 9.4 (SAS Institute, Cary, NC, USA). Values were reported as median (range). The distribution of fetal incontinence scores before and after treatment was compared by a nonparametric Wilcoxon rank test for categorical data. A two-sided *P* value of less than 0.05 was considered to be statistically significant.

### 3. Results

During the study period, 3457 patients aged younger than 18 years were treated for rape-related injuries at the HGRP. Nine (0.3%) of the

patients were male. In total, 205 (5.9%) patients were aged 5 years or younger and constituted the study group. In this group, all individuals were female and 145 (70.7%) were admitted within 72 hours of the assault.

None of the study patients suffered cerebral lesions. Isolated mucocutaneous lesions were noted in 162 (79.0%) girls. Of these girls, 26 (16.0%) presented with a lacerated hymen membrane. All 162 patients were allowed to leave the hospital without further treatment after thorough assessment. No readmission was required in this group.

Among the 205 study patients, 22 (10.7%) had musculocutaneous lesions without incontinence and were hospitalized until they showed clinical healing. None of these girls required surgical treatment.

A further 21 (10.2%) patients had musculocutaneous lesions together with incontinence and required surgical treatment (Figs. 1–3). In this group of survivors of rape with extreme violence, the mean age was 42 months (range 18–60). The crime scene of the rape was outside the home (in the bush) for 18 (85.7%) girls and at home for the other 3 (14.3%) girls. The rapist was unknown in 14 cases and known in 7 cases (a neighbor in three cases, a servant in two, and a soldier in two). One girl reported being raped by two men. For 20 girls in this group, the median time between the rape incident and presentation at HGRP was 1 day (range 0–435); for one girl, the date of rape could not be retrieved.

All surgical procedures were performed electively. The median time between admission and surgical treatment was 10 days (range 1–36). Two patients underwent surgery on the day after admission, but they had been admitted 69 and 170 days after the rape incident, respectively. One girl with peritonitis was treated by antibiotics while awaiting elective surgery.

Among the 205 study patients, 16 (7.8%) presented with isolated fecal incontinence and underwent perineal and anal sphincter repair. Three (1.5%) girls (aged 3.5, 5, and 5 years) who presented with combined fecal and urinary incontinence underwent concomitant urethral repair. Two (1.0%) girls (aged 1.5 and 5 years) presented with combined fecal and urinary incontinence and perforation of the vaginal vault.



Fig. 1. Initial musculocutaneous lesion with fecal incontinence.



Fig. 2. Healing musclocutaneous lesion after perineal and anal sphincter repair.

These patients underwent elective laparoscopic exploration. No further laparoscopic treatment was required for one of the two patients; adhesiolysis was performed for the other. No protective colostomy was performed.

For the 21 patients who underwent surgery, the median operative time was 60 minutes (range 40–120). Blood loss was insignificant in



Fig. 3. Normal perineal aspect at follow-up after surgical treatment of musclocutaneous lesions. Continence score of 6 by Kelly's [6] classification.

all cases. There were no major perioperative or postoperative complications. The median hospital stay was 26 days (range 5–39). None of the patients died. Medicolegal evidence of the lesions was obtained by clinical photography before and after the operation for 17 (81.0%) patients.

Full perineal cosmetic recovery was obtained for 19 (90.5%) girls who underwent surgery. In all these cases, the mother's satisfaction index was 5 (very satisfied). In the other two cases, perineal recovery was incomplete and the mother's satisfaction score was 3 (neutral). In one case, the girl presented with scar retraction after gunshot lesions to the vagina during the rape, in addition to urinary and fecal incontinence and perforation of Douglas pouch. In the other case, hymen repair was judged to be cosmetically insufficient by the mother.

The median fecal incontinence score was 1 (range 0–3) before surgery and 6 (range 2–6) after surgery ( $P < 0.001$ ) at a median follow-up of 10.4 months (range 2–133). No further treatment, anal digital aid at defecation, or specific dietary measures were required during the postoperative course. Urinary incontinence (continuous soiling) was present in five patients preoperatively and in one postoperatively. The patient with persistent urinary incontinence was the survivor of the gunshot to the vagina.

#### 4. Discussion

The present treatment strategy of rape-induced genitourinary and rectovaginal trauma in girls aged 5 years and younger seems to have provided good functional and cosmetic outcomes, given the absence of operative morbidity, improvements in fecal continence, healing of four of five urinary incontinence cases, and good cosmetic appearance for 91% of the patients.

The strategy used at HGRP is unusual in that it restricts the operative treatment to patients affected by incontinence and is strictly elective. The conservative treatment for patients without incontinence seems to be beneficial because none of the patients affected by only mucocutaneous lesions required readmission, and the musclocutaneous lesions in the patients who did not have incontinence healed spontaneously. The latter outcome is in accordance with findings in another study [4].

Surgery was performed for patients who were affected by incontinence but, by contrast with the strategy of Sham et al. [7], it was not attempted as an emergency procedure but was delayed and performed electively. The only patient presenting with peritonitis was treated conservatively by antibiotics and observed rather than explored surgically, because emergency surgery was deemed too invasive in a small child. To delay surgery in cases of peritonitis might be hazardous [7], but laparoscopy was not available at the time. The median time between admission and surgery was 10 days; however, surgery was scheduled for the day after admission for two patients because the rape had occurred 69 and 170 days previously and further delay would have had no benefit. As a rule, surgery was delayed to avoid having to repair the perineum in an infected environment. In 86% of the cases, the raped girls were abducted from their homes and dragged into potentially septic muddy fields. Consequently, an immediate surgical approach has septic hazards, as demonstrated by Öztürk et al. [8], who reported a rate of septic complications of 29% after emergency operation. By contrast, there were no septic complications in the present study.

Despite the fact that there were no perioperative or postoperative complications, the median hospital stay was 26 days. This long stay might be explained by the HGRP's policy to accommodate the mother's apprehension regarding confrontation with the crime scene and the crime perpetrator.

At a median follow-up of 10.4 months, the outcome seemed to be good in most cases. Fecal incontinence was cured in all cases (median score 6) and the only patient with persisting urinary incontinence had received a massive assault with a gunshot wound to the vagina in addition to the rape itself.

Notably, among the seven identified rapists who committed their crime with such extreme violence that surgery became necessary,

**Table 1**  
Classification of gender-based genitourinary and rectovaginal trauma in girls younger than 5 years.

Tissue involved	Type I (n = 162)	Type II (n = 22)	Type III (n = 16)	Type IV (n = 3)	Type V (n = 2)
Perineal skin and mucosa	+	+	+	+	+
Perineal muscle	-	+	+	+	+
Anal sphincter (fecal incontinence)	-	-	+	+	+
Bladder and urethra (urinary incontinence)	-	-	-	+	+
Evisceration through vaginal vault	-	-	-	-	+

only two were soldiers and the remaining five were neighbors or servants who took advantage of the climate of impunity, thereby extending the crime of rape to the civilian society.

By contrast with reports pertaining to rape crimes in other parts of the world, none of the patients in the present study had concomitant cerebral lesions [5], which reflects the unusual character of the type of rape being perpetrated in this population.

Inspection performed under general anesthesia after full control of infection facilitated a highly detailed examination of the sequelae of the rape. Difficulties in staging the injuries of the patients were encountered because of the incomplete classifications that have been proposed so far. Most classifications address only anorectal lesions [9–12], and thus sometimes omit intra-abdominal lesions [8], which would exclude the five patients in the present series who had urinary incontinence, especially the two girls with perforation of Douglas pouch. In the present study, there were no cases of urinary incontinence without concomitant fecal incontinence, or of perforation of Douglas pouch without concomitant fecal and urinary incontinence, which facilitated straightforward classification.

As a result, Mukwege’s [13] classification was retrospectively adopted because it seemed to be complete and allowed the inclusion of all the present cases without ambiguity (Table 1). Clinical findings might be explained by increasing violence deployed during the rape incident, successively causing rupture of the anal sphincter, the urethra, and Douglas pouch. Thus, Mukwege’s [13] classification evolves in parallel with the degree of violence deployed for penetration.

Each stage of the classification corresponds to a specific type of surgical treatment (Fig. 4). Whereas patients with type I or II injuries do not require surgical treatment, the others require operative treatment of increasing magnitude in accordance with the type of injury. Thus, in the present study, type III patients underwent perineal repair together

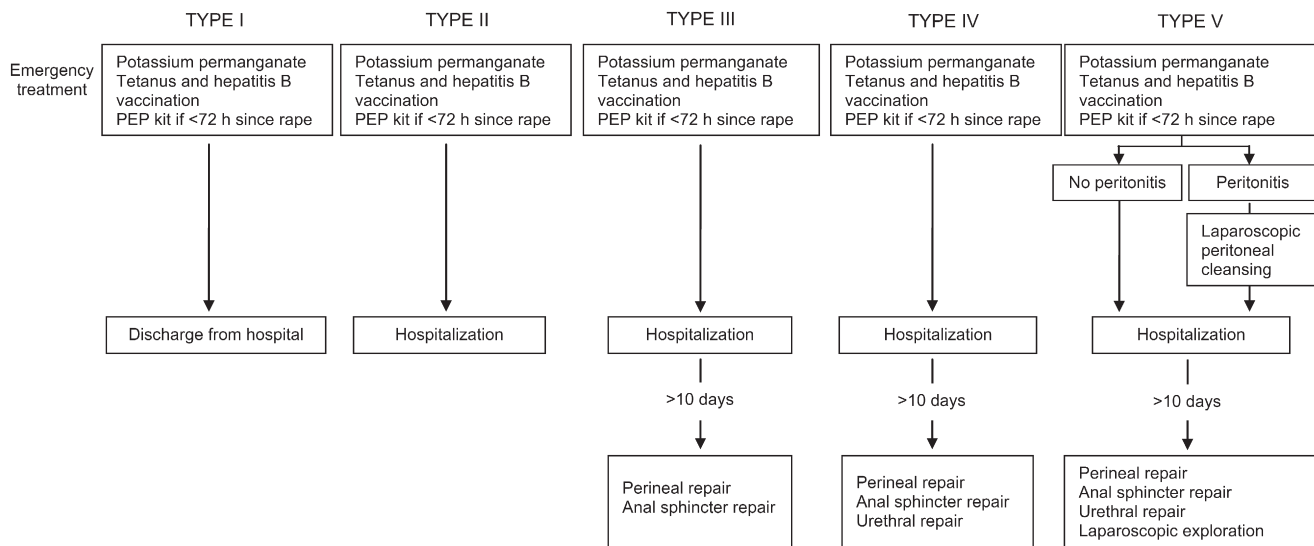
with repair of the anal sphincter; type IV patients underwent the same treatment plus urethral repair; and type V patients required perineal, anal sphincter, and urethral repair plus a laparoscopic exploration.

In one of the two patients with type V injuries, laparoscopic exploration enabled the presence of adhesions and chronic intraperitoneal lesions to be ruled out. In the other patient, laparoscopic adhesiolysis was performed. The use of a 4-mm cystoscope for visual control helped to avoid excessive parietal trauma, which would have been out of proportion given that the exploration was negative in one of the two patients.

The present strategy to address rape-induced urogenital and low gastrointestinal lesions among extremely young patients consisted of adjusting patient management to the severity of the lesions. This strategy seemed to be safe and efficient. In an effort to codify the approach, Mukwege’s [13] pragmatic algorithm coincided with the treatment philosophy and facilitated the inclusion of all cases without exception.

Mukwege’s classification [13] is simple and unambiguous, and every stage corresponds to a specific treatment. As a result, use of this classification might help, first, to selectively refer specific cases (i.e. types III, IV, and V) to tertiary care facilities, even more so because the delay caused by the referral process seems to be beneficial by avoiding septic complications; and second, to reduce confusion in communication among surgical teams dedicated to the care of the raped child.

The present study is restricted by its retrospective nature and its inherent limitations. For example, the observation of incontinence is limited by the fact that children younger than 5 years are often still incontinent and that the status of incontinence was evaluated by the mother rather than by objective measurements such as manometry. Moreover, although the outcome of the approach seems to be good in terms of physical variables, the sexual, obstetric, and psychological future of the patients remains unknown.



**Fig. 4.** Proposed procedural algorithm based on Mukwege’s classification [13] for management of urogenital and lower gastrointestinal lesions after child rape. Abbreviation: PEP, post-exposure prophylaxis.

### Conflict of interest

J.H. is a paid consultant to Ethicon and Covidien. G-B.C. is a paid consultant to Ethicon and Storz. The other authors have no conflicts of interest.

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