Injuries to the Genitalia in Female Children

J. M. WYNNE

SUMMARY

Experience with 33 female children who had sustained injury to the genitalia is reviewed. Twenty-four had been raped, 7 had fallen, and in 2 children injuries resulted from motor vehicle accidents.

Immediate examination under anaesthesia and careful repair are advised. Rape may result in extensive injuries, but the area heals well provided the repair is carried out early and all structures are correctly approximated.

The legal duties and obligations of the doctor to the patient and to the State after alleged rape have been reviewed. Considerable attention has been paid to the psychological consequences to the patient, to the risks of pregnancy and to the possibility of venereal infection. In larger urban centres rape services have been established and steps taken to provide emotional support. The psychological problems in children have been reviewed. The serious nature and extent of the physical injuries sustained by children, however, have received less attention. The principles of management do not differ from those employed for other injuries to this region in childhood.

The Raped Child

The youngest child who had been raped was 15 months old and the oldest was 12 years. The average age was 6 years, but 5 children were under 4 years of age. Sixteen children were admitted within 24 hours of the assault, but in 8 admission had been delayed for periods of up to 1 week.

Pattern of injury. Three children had bruising and minor lacerations of the vulval region only, and penetration had not occurred. All the remainder had posterior midline lacerations extending into the perineal body. Seven were first degree (muscles intact), 10 were second degree (muscles torn) and 4 were third degree (extending into the rectum).

All these tears involved the lower vagina at the introitus, but 13 patients had more extensive lacerations extending up the posterolateral wall of the vagina. In 5 this reached the vaginal vault, extending into the vascular pericervical tissues of the lateral fornix. In 2 instances the laceration crossed the vault behind the cervix to reach the opposite fornix, and in 1 of these the abdomen had been penetrated posteriorly. One patient had a discontinuous wound in the vaginal vault associated with a small perineal laceration. Haemorrhage was a major problem in lacerations of the vaginal vault.

Injuries Caused by Falls

Seven children had sustained injury after falling astride some object. Their ages ranged from 3 to 11 years. Four had lacerations of the labia or clitoris. In 2 patients the fourchette was torn and in 1 a small wound was found inside the vaginal introitus. Bruising and haematoma formation were prominent in 2. In no case had there been penetration with damage to internal organs.

Motor Vehicle Accidents

Two children had been involved in motor vehicle accidents. In one 8-year-old the injury was isolated and due to direct trauma to the perineum. An extensive laceration passed through the right crus of the clitoris and extended posteriorly, lateral to the vagina to sever the anal muscles.

The other patient, a 4-year-old, had extensive multiple injuries including traumatic subtrochanteric amputation.

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<table>
<thead>
<tr>
<th>Cause of injury</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rape</td>
<td>24</td>
</tr>
<tr>
<td>Minor injuries</td>
<td>3</td>
</tr>
<tr>
<td>Posterior vulval lacerations</td>
<td>21</td>
</tr>
<tr>
<td>Muscles intact</td>
<td>7</td>
</tr>
<tr>
<td>Muscles torn</td>
<td>10</td>
</tr>
<tr>
<td>Rectum torn</td>
<td>4</td>
</tr>
<tr>
<td>Extensive vaginal lacerations</td>
<td>13</td>
</tr>
<tr>
<td>Abdominal penetration</td>
<td>1</td>
</tr>
<tr>
<td>Falling astride</td>
<td>7</td>
</tr>
<tr>
<td>Minor lacerations</td>
<td>6</td>
</tr>
<tr>
<td>Bruising and haematoma</td>
<td>2</td>
</tr>
<tr>
<td>Penetrating injuries</td>
<td>0</td>
</tr>
<tr>
<td>Motor vehicle accidents</td>
<td>2</td>
</tr>
<tr>
<td>External lacerations</td>
<td>1</td>
</tr>
<tr>
<td>Lacerations by fractured pelvis</td>
<td>1</td>
</tr>
</tbody>
</table>

TABLE I. NATURE OF INJURIES (33 PATIENTS)
of the right leg, degloving injury of the abdomen and left thigh, and a fracture of the left tibia. There was an extensive fracture of the pelvis with displacement of fragments — these had transected the urethra and fragmented the vagina.

**PROCEDURES**

The authorities were notified in all cases of rape, and accurate records were made of the injuries. Swabs for sperm analysis were taken for medicolegal purposes and blood was crossmatched routinely. All children with genital injuries were examined under anaesthesia to determine the extent of the injury. Table II indicates the number of patients who underwent different forms of treatment.

**TABLE II. TREATMENT (33 PATIENTS)**

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>None necessary</td>
<td>4</td>
</tr>
<tr>
<td>Repair alone</td>
<td>24</td>
</tr>
<tr>
<td>Repair with colostomy</td>
<td>2</td>
</tr>
<tr>
<td>No repair (sepsis)</td>
<td>3</td>
</tr>
</tbody>
</table>

Children with injuries caused by a fall or a motor vehicle accident were seen soon after the incident, and when necessary the wounds were sutured. In the raped children a decision to leave the wound unsutured and delay repair was based on the time which had elapsed since injury, the degree of soiling, and the presence of frank sepsis as evidenced by oedema, erythema or pus. Neither time nor soiling alone precluded primary repair. All injuries sustained less than 24 hours before admission were repaired. When doubt existed about healing, a limited repair was performed, suturing the rectal and anal mucosa, when torn, with interrupted sutures. The anal muscles were approximated loosely to permit drainage and prevent retraction, and so facilitate a second repair if it was required later. In these potentially septic cases the vaginal mucosa and perineal skin were left unsutured or approximated loosely so as to prevent retraction but not limit drainage. In a septic third-degree tear in one patient admitted 2 days after injury the rectal mucosa was loosely approximated and the anal muscles held forward on each side by a nylon suture which was tied over a gauze pack on the opposite side of the perineum. Catgut was used in most cases, but more recently I have employed Dexon.

Of the 33 children injured, 4 had insignificant injuries which were not sutured, 26 underwent either complete or partial primary repair, and in 3 the injury was too soiled or septic for any form of surgical therapy. A defunctioning left iliac colostomy was performed at the same time as repair in 2 of the 4 children with lacerations extending into the rectum — the distal loop was emptied of faeces, and neomycin solution was instilled continuously into the distal limb of the colostomy for the first few days postoperatively. A tear involving the rectum in the 3rd patient was sutured without a colostomy, and in the 4th was left unsutured because of sepsis.

Lacerations of the vagina extending into the vaginal vault posed a particularly difficult problem because of the vascularity of this area. Profuse bleeding commenced as soon as the area was cleaned. The facility with which the lacerations could be sutured depended on the extent of the perineal laceration which aided exposure. Five of the 13 children with vaginal lacerations had only minor perineal lacerations, 6 had lacerations involving muscle, and in 2 the rectum had been torn. Adequate assistance, several different sized and shaped narrow retractors, good lighting, suction, and long, fine forceps and needle holders are essential. Bleeding was controlled and the vagina repaired in all cases except 1. Here it was necessary to pack the vagina for 48 hours.

A laparotomy was performed to evacuate a septic intraperitoneal haematoma in a 5-year-old who had been raped 3 days previously. The abdomen had been penetrated through the posterior fornix.

All the children who had been raped received broad-spectrum antibiotic therapy effective against both venereal infection and bowel organisms.

Children with lacerations involving the rectum were sedated postoperatively and restrained to limit movement. They were rendered constipated for 5-6 days with codeine phosphate and a low-residue diet. The perineal area was washed carefully after micturition. All other children were allowed normal ward activity, with washing or a bath daily and after each bowel action.

**RESULTS**

Of the 26 children who underwent immediate repair of their injuries, 22 healed uneventfully. Three required a second procedure. In 2 this followed a primary repair of the perineum. One was the result of a partial wound breakdown, and in the other the perineum had been sutured after packing the vagina because of bleeding and this initial repair was clearly inadequate. The 3rd patient underwent a further repair after a limited anchoring of the muscles performed while the area was septic. One patient treated similarly failed to attend for repair (Table III).

**TABLE III. RESULTS**

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary repair</td>
<td>26</td>
</tr>
<tr>
<td>Complete healing</td>
<td>22</td>
</tr>
<tr>
<td>Second repair necessary</td>
<td>3</td>
</tr>
<tr>
<td>Failed to attend for second repair</td>
<td>1</td>
</tr>
<tr>
<td>Primary repair not attempted</td>
<td>3</td>
</tr>
<tr>
<td>Delayed repair performed</td>
<td>1</td>
</tr>
<tr>
<td>Defaulted</td>
<td>2</td>
</tr>
</tbody>
</table>

One of the 3 children in whom primary repair was not attempted because of sepsis returned for repair. The other 2 defaulted.

In all, 8 of the children failed to attend for a final postoperative examination. The remainder had well reformed perineums and vulvas, with evidence of anal sphincter action. Faecal incontinence was not encountered, but fine control over fluid and flatus could not be assessed.
Long-term follow-up was not possible, but one child
admitted 6 months later with another complaint was found
to have condylomata acuminata in the vulva.

**DISCUSSION**

A classification of genital injuries is suggested in Table
IV.1,7 Bruising, laceration or penetration will depend on
the nature of the object inflicting the injury, which in
children is usually caused by falling astride some object.
Injuries of this sort may also result from assault or a
motor vehicle accident.

**TABLE IV. CLASSIFICATION OF FEMALE GENITAL
INJURIES**

<table>
<thead>
<tr>
<th>External injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruising and haematomas</td>
</tr>
<tr>
<td>Lacerations</td>
</tr>
<tr>
<td>Penetrating wounds</td>
</tr>
<tr>
<td>Disruptive injuries</td>
</tr>
<tr>
<td>Obstetric injuries</td>
</tr>
<tr>
<td>Postcoital injuries including rape</td>
</tr>
<tr>
<td>Posterior lacerations</td>
</tr>
<tr>
<td>Vaginal vault injuries</td>
</tr>
<tr>
<td>Injury from fractured pelvis</td>
</tr>
</tbody>
</table>

Postcoital injuries and obstetric injuries1,7 are not dis-
similar in nature, but with modern obstetric practice and
timely episiotomy extensive injuries such as are encoun-
tered in the assaulted child are infrequent.

Fragments from the bony pelvis may lacerate the
genitalia after extensive fractures. Major haemorrhage,
shock and other life-threatening injuries will take pre-
cedence over the genital injuries.

The danger of injury to pelvic viscera following pe-
nerating wounds is recognized.12 The serious nature of the
injuries caused by rape is obscured by their inclusion in
adult series.12,13 In adults the introitus is adequate and
coidal injuries are uncommon, although serious lacerations of
the vaginal vault can occur, but in children the
introitus and perineum are torn when penetration occurs
and lacerations may extend up to the vaginal vault.

When the genitalia have been injured, immediate and
very careful examination is essential. In spite of contrary
practice elsewhere,1 I have found that in the small child
this can only be performed adequately under anaesthesia.

Rape should not differ in this respect, and I have seen
extensive vault injuries overlooked. The results of treat-
ment of genital injuries are excellent provided that the
exact extent of the injury is determined and a meticulous
careful repair is undertaken. Problems in repair arise from
ears of the vaginal vault, retraction of muscles, soiling
or sepsis.

Lacerations in the vaginal vault can bleed profusely
and access in the small vagina is difficult. Nevertheless,
under optimal conditions repair is usually possible, and
should precede repair of the perineum.

The major problem in perineal repair is retrieval of
the anal sphincters, which retract deeply into the fatty
tissues. The first portion located can be drawn forward
by sutures, and the area above and below this searched
with the point of a needle until the entire sphincter is
displayed by traction on the sutures. The pelvic diaphragm
can then be found. The procedure is facilitated by leaving
the muscle sutures untied until they have all been placed.
Care is taken to ensure that all structures are adequately
identified and are approximated correctly. The vaginal
mucosal sutures are inserted and tied before exposure is
reduced by tying the muscle stitches. Reconstruction of
the introitus completes the operation.

Delay, soiling and sepsis are time-honoured indications
for delaying wound repair. A major problem in under-
taking a subsequent repair in this area is the retraction and
shortening of anal muscles which occurs. In spite of wide
mobilization I have found it difficult to identify the
sphincters, and approximation around the anus without
some tension is seldom possible. It is an impression based
on several years' experience that subsequent repair is
much easier when a previous primary repair has been
attempted, as the anal sphincters have been anchored
antero-laterally to the scar.

Healing has often occurred surprisingly well, in spite
of some soiling or delay, when the muscles have been
approximated loosely so that free drainage can occur.
A second repair has often not been necessary and I
now attempt primary repair much more readily.

When an injury extending into the rectum is recent
and soiling is minimal it can be treated similarly to an
obstetric injury and sutured without a colostomy. How-
ever, when there has been delay, soiling or sepsis, diversion
of the faecal stream is necessary. I have performed a left
iliac colostomy with separation of the divided ends to
ensure complete protection from faeces. It is important
that the distal segment of bowel be emptied completely,
as retained faeces constitute a continuous source of sepsis.

The bacterial flora in the distal segment of bowel were
further reduced by infusing neomycin into the lower stoma.
Under this regimen one patient with gross soiling of the
injury healed completely after loose suturing. In a 2nd
frankly septic case the loosely approximated rectal and
anal mucosa healed and the sphincters, held forward by
nylon sutures, became anchored to scar tissue anteriorly.
In these children frank faecal incontinence should not
occur provided an adequate bulwark of tissue is provided
anteriorly against which the undamaged puborectalis sling
can act. Discriminatory continence dependent on intact
internal and external sphincters could only be assessed
after more long-term follow-up, and this did not take
place.

The literature has focused on the psychosocial aspects
of sexual assaults and attention has been directed to treatment
in this field.5,6,8 I was separated from my patients by
battering and verbal language barriers, so an effective approach
along these lines was seldom possible. The bewildered
child learns how to interpret traumatic and unusual
situations from those around her. Additional psychic trauma
may ensue from the response of parents, friends,
nurses and doctors. Violence and rape were common in
the community and were a recognized hazard of every-
day life. Parental responses were resigned and calm rather
than emotional, and we did not encounter obvious severe
emotional problems in the children. This 'routinization' (the term is derived from the term 'Veralltäglichung', employed by the German sociologist Max Weber (1864-1920) to indicate the process by which something is made to be everyday and so is given everyday meanings and social stability) of the event for the child was encouraged in the ward routine and by the common sense of the nursing staff and social workers.

Twenty of the 24 raped children came from the townships around the city, and this high incidence is disturbing. The offence was committed by a stranger or sometimes by an acquaintance of the family. Assault by a parent was not encountered.

REFERENCES

Vaginoplasty

T. S. CAIRNS, W. DE VILLIERS

SUMMARY

The historical development of vaginal reconstruction in vaginal atresia is reviewed. Two more recent indications for vaginoplasty are (i) total pelvic exenteration for carcinoma; and (ii) sex conversion in trans-sexuals. The operations available for these conditions are discussed, with particular emphasis on sex-conversion techniques. A method of vaginoplasty in inadequately treated trans-sexuals, using random medial thigh flaps, is presented with illustrative case reports.


HISTORICAL DEVELOPMENTS

Surgical attempts at the creation of an adequate vaginal passage date back to the days of Hippocrates in the 4th century BC. These references, and those of Roman academics in the 1st century AD, apply to the correction of the imperforate vagina, and involve simple incision of the membrane and packing of the vagina to keep the raw edges apart.

Later Roman references in the 6th century AD discuss true vaginal atresia and surgical attempts to correct it. By a combination of sharp and blunt dissection (without anaesthesia) a vaginal cavity was created and maintained with various ingenious stents until healing had occurred by epithelialization and scar formation. Not surprisingly, mortality was rather high owing to peritonitis or rupture into the urinary tract or rectum.

After the Graeco-Roman era, Arab and Jewish medical writers described several cases of vaginal atresia, and these are followed by Renaissance references to the condition, the method of treatment still consisting of simple dissection of a passage and packing awaiting eventual epithelialization.

In the 18th century, a Dutch surgeon, Job van Meck'ren, described an interesting case of a young female with vaginal atresia and a rectovaginal fistula, who, 'unable to resist the heated pleas of her adored lover, agreed to couple by the only way practical' and subsequently gave birth to a full-term infant through her anus. His thesis