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'Fracture' of the penis: a case series

陰莖折斷的個案研究

Objectives. To examine the epidemiology of penile 'fracture' and its presenting characteristics in the local population.

Design. Retrospective study.

Setting. District hospital, Hong Kong.

Patients. Patients with a discharge diagnosis of 'fractured' penis during a 7-year period from August 1998 to August 2005.

Main outcome measures. Age, time of attendance, cause, symptoms, signs, emergency department diagnosis, site of rupture, operative findings, and final outcome.

Results. A total of 11 patients were identified. The mean age was 44 years (range, 30-63 years). The interval between time of injury and presentation ranged from 17 minutes to 7 days. Seven (64%) cases were attributed to sexual intercourse, three (27%) to penile manipulation, and one (9%) to rolling over the erect penis during sleep. Ten patients underwent surgery; all had primary suturing of the tunica tear, while two also required primary urethral repair. At follow-up, three (27%) patients had erectile dysfunction, one had mild penile deformity and one had a mild urethral stricture.

Conclusion. Emergency physicians and surgeons, as well as family physicians, should be familiar with the presentation of 'fractured' penis, as prompt diagnosis and early surgical repair are instrumental in ensuring a successful outcome with minimal complications. The public should also be educated to seek medical attention immediately, as delay or failure to report may result in permanent physical and psychological disabilities that could otherwise have been avoided.

目的：調查本地的陰莖「折斷」個案，以及在本地人口中出現的表徵特點。

設計：回顧性研究。

安排：地區醫院，香港。

患者：1998年8月至2005年8月這7年內，被診斷為陰莖「折斷」的病人。

主要結果測量：年齡、入院時間、受傷原因、症狀、體徵、急症部門的診斷、「折斷」位置、手術發現和最終結果。

結果：是次研究共有11名病人，平均年齡為44歲（介乎30歲至63歲）。由受傷到求醫相距時間，由17分鐘至7日不等。有7人（64%）在性交時受傷、3人（27%）在操控陰莖時受傷，1人（9%）則因為睡覺轉身時壓着勃起的陰莖而受傷。10名病人接受了直接膜裂縫合，其中兩人更需直接尿道復修。手術後，3名病人（27%）出現勃起機能失調，1名病人有輕微陰莖變形，1名病人出現輕微尿道狹窄。

結論：即時診斷和及早進行手術治療，對成功治愈陰莖「折斷」和減低併發症十分重要。因此，急症科醫生、外科醫生，以及家庭醫生都應該熟習陰莖「折斷」的表徵。此外，亦要教導市民即時尋求醫生協助，否則延誤治療或不作治療可能引致永久的身體及心理無能。

Key words:

Male;
Middle aged;
Penis/injuries;
Rupture

關鍵詞：

男性；
中年；
陰莖 / 受傷；
破裂

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Introduction

Penile 'fracture' is an uncommon but probably underreported urological emergency that may have devastating physical, functional, and psychological consequences.^{1,2} Most reports are from the Mediterranean region and the western hemisphere.³ In the Far East, it has only been reported in the medical literature from Japan, Taiwan, and Singapore.⁴⁻⁶ In Hong Kong, it has been reported only in local newspapers and at scientific meetings, not in medical journals.^{7,8} As prompt diagnosis and expeditious surgical repair are vital to ensure a good outcome, a retrospective study was carried out in a general district

Table 1. Injury characteristics, operation, and outcome

Case No.	Age (years)	Attributed mechanism of injury	Site of injury	Operation*	Follow-up (months)	Complication/remark
1	50	Intercourse	Base	Suture repair of right CC tear	1	Nil
2	30	Manipulation	Mid-shaft	Suture repair of right CC tear	18	Nil
3	63	Roll over during sleep	Base	Suture repair of right CC tear	13	Nil
4	51	Intercourse	Mid-shaft	Suture repair of both CC+CS tear, end-to-end urethral anastomosis	13	Decreased rigidity of erection, normalised with sildenafil; mild urethral stricture
5	38	Intercourse	Base	Suture repair of right CC+CS tear	11	Nil
6	38	Manipulation	Mid-shaft	Suture repair of right CC tear	0	Paraplegic, no urology follow-up
7	41	Manipulation	Base	Suture repair of right CC tear	1	Nil
8	43	Intercourse	Base	Suture repair of right CC tear	22	Decreased rigidity and duration of erection, improved with sildenafil
9	39	Intercourse	Distal	Suture repair of left CC+CS tear, and urethral partial tear	16	Decreased duration of erection, requiring sildenafil
10	36	Intercourse	Unknown	Conservative (presentation after 7 days)	0	Discharged himself against medical advice
11	54	Intercourse	Distal	Suture repair of right CC tear	3	Penile scarring

* CC denotes corpus cavernosum, and CS corpus spongiosum

Table 2. Clinical features on presentation

Clinical feature	Patients No. (%)
Swelling	11 (100)
Ecchymosis	10 (91)
Pain	10 (91)
Penile angulation	7 (64)
Sudden snapping sound	6 (55)
Urethral bleeding	2 (18)
Voiding difficulty	2 (18)
Gross haematuria	1 (9)

Table 3. Discrepancies between initial and subsequent history in four patients

Initial history	Subsequent finding
Hit against table corner	Hit partner's perineum during sexual intercourse
Hit by falling edge of a door during repair	Sexual intercourse
Bent erect penis to pass urine	Sexual intercourse
Unknown/unwilling to tell	Rolled over erect penis during sleep

hospital in Hong Kong to examine its epidemiology and presenting characteristics in the local population.

Methods

Data of patients with a discharge diagnosis of 'fractured' penis from August 1998 to August 2005 were retrieved from the computer database of the North District Hospital. Patient age, time of attendance, attributed cause, symptoms, signs, emergency department diagnosis, site of rupture, operative findings, and final outcome were analysed descriptively.

Results

A total of 11 patient records were retrieved. All were Chinese by race and the mean age was 44 years (range, 30-63 years). All except two presented between 12:00 am and 12:00 noon. The interval between time of injury and presentation ranged from 17 minutes to 7 days.

The North District Hospital serves a population of around 300 000. Nevertheless only six of the patients resided in its 'catchment area'. Two patients were referred from a nearby hospital, and two had just returned from Mainland China and presented to us as the hospital nearest to the 'border'. The patient who presented on day 7 lived far from the

hospital and had already consulted private practitioners but without improvement. The annual incidence was thus 0.29 per 100 000 local residents. Seven (64%) cases were attributed to intercourse, three (27%) to penile manipulation, and one (9%) to rolling over the erect penis during sleep. Patient age, injury characteristics, operations, and outcomes are shown in Table 1. Clinical features at presentation are summarised in Table 2. Two patients with urethral bleeding also had difficulty voiding and subsequently required urethroplasty. The emergency department diagnosis was penile 'fracture' in eight (73%), penile injury in two (18%), and paraphimosis in one (9%). Ultrasonography was performed on only one patient, but failed to confirm the diagnosis or detect a rupture. Four patients gave a different account of their injury at initial presentation (Table 3). One admitted hitting the female pubis during 'doggy style' sexual intercourse. The patient who presented after 7 days was managed conservatively but discharged himself against medical advice and was lost to follow-up. In the remainder who underwent surgery, seven had rupture of one corpus cavernosum only, all on the right side. Two had rupture of one corpus cavernosum plus the corpus spongiosum, one on the right side, the other on the left. The remaining patient had rupture of both corpora cavernosa and the corpus spongiosum with complete urethral rupture. Five (50%) of the 'fractures' occurred at the base, three at the mid-shaft, and the

remaining two in the distal third. The duration of hospitalisation ranged from 3 to 21 days (median, 4 days). Two patients were lost to follow-up; and in the remainder it ranged from 1 to 22 months. Three (27%) patients had erectile dysfunction, one sustained a mild penile deformity, and one a mild urethral stricture. None agreed to undergo further diagnostic investigation or surgical intervention.

Discussion

Penile 'fracture' involves rupture of the tunica albuginea of the corpus cavernosum, typically in the erect state. The tunica albuginea measures about 2 mm in thickness, thinning to about 0.25 mm during erection.² The most frequently reported mechanism of injury is blunt trauma during sexual intercourse or penile manipulation, especially masturbation, including kneading, forcibly bending the erect penis to pass urine, or rolling onto the erect penis.^{1,3} The two most common causes relate largely to the geographical area; vigorous vaginal intercourse and penile manipulation being the predominant causes in the western hemisphere and the Middle East, respectively.³ Our results concurred with the former. There have been no reports of the injury arising from anal intercourse or fellatio. Corpus spongiosum and urethral injury have been reported more frequently in association with sexual intercourse than penile manipulation.³ In our series, the three patients with corpus spongiosum injury were engaged in sexual intercourse at the time of injury. As a result of cultural taboos, patients may be too ashamed or embarrassed to seek medical attention and/or provide a history. This was certainly the case for some of our patients. Thus, in cases of suspected penile 'fracture', privacy, empathy, tact, and persistence are required to extract the true history.

An annual incidence of 0.33 to 1.36 per 100 000 inhabitants has been cited,⁹ higher than our incidence of 0.29. Most patients were in their fourth decade.³ Diagnosis can usually be based on history and clinical findings alone.^{2,3} Characteristically, the patient hears a sharp, snapping sound followed by rapid detumescence, pain, swelling, ecchymosis, and deformation of the penis.^{1,4,10} There may be a palpable gap or depression in the penile shaft.³ The 'rolling sign' results from a clot trapped in a well-localised position under Buck's fascia, being felt as a discrete, smooth, fixed, tender, firm lump at the 'fracture' site over which the penile skin may be rolled.^{2,3,11} The 'fracture' occurs more often in the proximal shaft, as in our cases, and is located ventrally in coital injuries. Likewise, the right side is more often affected than the left. Typically the penis deviates to the side opposite the injury, producing an 'eggplant deformity'—the purple ecchymosis and subcutaneous swelling, combined with the deviation, gives the appearance of an eggplant.³ Blood at the external urethral meatus, gross haematuria, or voiding difficulties suggests urethral injury.¹⁰ The differen-

tial diagnosis includes a tear of the deep dorsal vein of the penis.²

Ultrasonography, cavernosography, retrograde urethrography, magnetic resonance imaging, colour Doppler duplex scanning, angiography, and urethroscopy have been suggested for various indications.^{1,3} The usefulness of imaging in detecting cavernosal injury is debatable; and most authors have reported accurate diagnoses without resort to such studies. In most cases, prompt surgical exploration should be performed in preference to preliminary penile imaging (other than urethrography for suspected urethral injury).² If the history and physical findings are typical, additional diagnostic procedures will unnecessarily delay surgery.¹² The use of penile cavernosography remains controversial as there is a significant incidence of false-negative results as well as a risk of tissue reactions to contrast material and increased liability to corporal fibrosis. Most authors recommend it only if findings on physical examination are equivocal despite a history suggesting a 'fracture'. Ultrasound has a limited role in the diagnosis of penile 'fracture': it is operator-dependent and interpretation depends on the examiner's experience. The rarity of this condition often precludes wide experience and accurate diagnosis and small albuginea disruptions or the presence of clots at the 'fracture' site may make diagnosis difficult.^{12,13} Magnetic resonance imaging is the most accurate diagnostic and localising procedure, owing to its multiplanar capabilities, and good spatial and tissue contrast resolution.^{3,12,13} Despite its limited availability and high costs, it is justified in atypical or equivocal cases of suspected penile 'fracture'.^{2,13} Although too expensive for routine use, it can help to avoid unnecessary surgery or assist in deciding the surgical approach. A long incision, wide dissection, or complete degloving of the penis with risk of injury to the dorsal neurovascular bundle can thus be avoided.^{13,14}

The treatment of penile 'fracture' has evolved dramatically. Traditional conservative measures, including pressure dressing, cold compress, anti-inflammatory drugs, fibrinolytics, antibiotics, antiandrogens, and/or sedatives are now the exception rather than the rule.^{2,3} The modern trend overwhelmingly favours urgent surgical repair, including evacuation of the haematoma, ligation of bleeding vessels, debridement, suturing of tears in the tunica albuginea, urethral stenting, and/or end-to-end urethral anastomosis. In the limited data reported in the literature, operative treatment has consistently resulted in fewer complications and a superior outcome.^{1-5,8,9,13}

Late complications include penile deviation, painful erection, penile pain during intercourse, erectile dysfunction, urethrocavernous fistula, urethrocutaneous fistula, and urethral stricture.³ These may necessitate further corrective surgery. Patients should be warned that erectile dysfunction is more likely to be related to the severity of the injury than to the surgery.²

With prompt diagnosis and early surgery, the results are excellent; hospitalisation being shorter, complications minimal, and return to sexual activity earlier.^{2,10}

This study was limited by its retrospective nature and the possibility of incomplete and/or missing data. The small number of cases collected made meaningful statistical analysis impossible. Hong Kong residents might have sought medical attention elsewhere.

Conclusion

Penile 'fracture' may be underreported by patients and clinicians. Emergency physicians and surgeons, as well as family physicians, should be familiar with its presentation as prompt diagnosis and early surgical repair are essential to ensure a successful outcome with minimal complications. Privacy, empathy, tact, and persistence are needed to obtain an accurate history in suspected cases, as patients may be embarrassed and reluctant to reveal the true mechanism of injury. The public should also be educated to seek medical attention immediately, as delay may result in permanent physical and psychological disabilities that are potentially avoidable.

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