CASE REPORT

Result of Health Illiteracy and Cultural Stigma: Fournier's Gangrene, a Urological Emergency

Manasi Jiwrajka,^{1,2} Krishan Pratap,^{1,2} William Yaxley,^{1,2} Nigel Dunglison^{1,3}

¹Department of Urology, Royal Brisbane and Women's Hospital, Herston, Queensland, Australia

²School of Medicine, University of Queensland, Brisbane, Queensland, Australia

³Department of Urology, Wesley Hospital, Brisbane, Queensland, Australia

Correspondence to

Dr Manasi Jiwrajka,
manasi.jiwrajka@uqconnect.
edu.au

Accepted 7 October 2017

SUMMARY

A 63-year-old Caucasian man presents to his regional hospital 8 days postinsertion of beads in his urethra, causing Fournier's gangrene of the penis and delayed surgical management of his gangrene. The reasons for his delay are cultural stigma associated with sexual practices and health illiteracy.

CASE PRESENTATION

A 63-year-old Australian man presented to his local hospital complaining of penile pain, swelling, dysuria and incomplete voiding. The patient's urological issues started eight days prior to presentation when he inserted a 15cm long string of plastic beads (4–5 mm in diameter) into his urethra causing some initial discomfort. Two days postinsertion the patient unsuccessfully attempted to remove the beads himself using a crochet hook, resulting in immediate penile pain and discharge of frank blood from urethral orifice. This was followed by severe dysuria as well as swelling of the entire penile shaft later that same day. The following day, the patient successfully removed the beads from his urethra using a crochet hook. Prior to this episode of insertion of beads, the patient had been inserting wooden pencils into his urethra without complications for 2–3 months for sexual pleasure.

A degree of pain relief was achieved by taking paracetamol and ibuprofen every two hours, but significant dysuria persisted despite this analgesia. Symptoms slowly worsened over the days postinsertion, with worsening intensity of the pain, urinary hesitancy, incomplete voiding and loss of urethral sphincter tone. On presentation to hospital, the patient described his penile pain as continuous, sharp 'like razor blades', 10/10 in intensity, located 'inside the penis' and not radiating. Penile pain also impaired the patient's ability to walk. The patient's medical history includes an episode of epididymo-orchitis 10 years ago and a vasectomy 30 years ago but is otherwise unremarkable. The patient is an arborist and was formally educated until grade 10, where he left school to pursue and complete a mechanical and electrical apprenticeship.

The delay to present to a medical practitioner was due to embarrassment and health illiteracy. The patient stated he would generally only see a general practitioner (GP) if he needed a medical certificate. Therefore, he presented directly to his local regional hospital emergency department where he was promptly referred and accepted under the

urology team. Examination on admission revealed a grossly oedematous penis, with erythema to the region and a malodorous smell (figure 1). A flexible cystoscopy was attempted, but the urethra was unable to be located, as a result of previous trauma. Subsequently, a suprapubic catheter was inserted, which drained purulent urine and urine microscopy, and culture later resulted in a positive test for *Escherichia coli*. The initial CT of his pelvis revealed gas bubbles in the penile soft tissue from the tip to the pubic symphysis.

Initial treatment included analgesia, fluids and intravenous antibiotics (piperacillin-tazocin), and involvement of the infectious diseases team. The patient experienced an initial improvement clinically and also chemically, as marked by a decreased white cell count. However, pain subsequently worsened, and on day 3 of his admission an area of necrotising tissue on the ventral shaft of his penis was identified. At this point, the antibiotic regimen was changed to cover for necrotising fasciitis (vancomycin, meropenem and clindamycin).

At the tertiary centre, the penis was surgically debrided and he underwent multiple surgeries for

Figure 1 Preoperative photograph of the perineal region showing significant inflammation of the penis and scrotum.

CrossMark

To cite: Jiwrajka M, Pratap K, Yaxley W, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-220836

Figure 2 Intraoperative photographs of the perineal region. (A) Taken during the debridement and degloving of the penile shaft. (B) After completion of debridement and degloving of the penile shaft. (C) Completed debridement and degloving of the penile shaft showing the depth of debridement.

urethroplasty and penile reconstruction (figure 2). Although his urethra could not be salvaged, a transperineal urethra was created, and the patient's ability to achieve erections was preserved (figure 3).

GLOBAL HEALTH PROBLEM LIST

1. Fournier's gangrene, a global health condition
2. Diagnosis, management and complicating factors of Fournier's gangrene
3. Health literacy and gender can cause delay in accessing healthcare and affect health outcomes
4. Cultural and social stigma can delay presentation
5. Rural and remote healthcare in Australia
6. Application of case report to the three-delay model.

GLOBAL HEALTH PROBLEM ANALYSIS

Fournier's gangrene: a global health condition

Fournier's gangrene is defined as a polymicrobial necrotising fasciitis of the perineal, perianal or genital areas.¹ The condition

Figure 3 Postoperative photograph of the perineal region showing the penis wrapped in mesh dressings.

most commonly affects men, but has been demonstrated to also occur in women and children.¹ An American epidemiology study published in *Urologia Internationalis* demonstrated that Fournier's accounted for <0.02% of hospital admissions and had an incidence of 1.6/100 000 men.²

Despite initially being described as an idiopathic condition, there are now several recognised risk factors for Fournier's disease.³ Fournier's disease frequently arises from an infection of the anorectum (30%–50%), urogenitalia (20%–40%) or genital skin (20%).³ Anorectal, urogenital and perineal traumas, including pelvic and perineal injury or pelvic interventions, are important causes of disease. Additionally, any condition that leads to a reduced level of cellular immunity theoretically predisposes to the development of Fournier gangrene.⁴ Diabetes mellitus is reported to be present in 20%–70% of patients with Fournier's gangrene and chronic alcoholism in 25%–50% of patients. Extremes of age, malignancy, chronic steroid use, cytotoxic drugs, lymphoproliferative diseases, malnutrition and HIV infection have all also been acknowledged as risk factors for the disease.^{3 4}

Diagnosis, management and complicating factors of Fournier's gangrene

The disease course of Fournier's is widely varied, ranging from that of an insidious onset to a rapidly progressive disease.⁵ Local symptoms are usually significant and include pain and swelling of the affected area. Death is most commonly caused by sepsis leading to multiorgan failure.⁵ The cornerstones of Fournier's management are early surgical debridement of necrotic tissue and antibiotic therapy. Despite this, Fournier's remains a life-threatening condition with a high mortality rate of 20%–30%.⁵ Surgical debridement of Fournier's gangrene in the public healthcare system costs \$A326.05 per procedure.⁶ In 2015/2016 financial year alone, there were 1593 cases of extensive postsurgical infections and Fournier's gangrene requiring surgical debridement, costing the Australian Medicare System approximately \$A520 000.⁷ A study conducted in Melbourne analysed the cost of treating necrotising fasciitis in general, and found that the mean cost of treating a patient with necrotising fasciitis in 2005 was \$A64 517.⁸

Health literacy and gender can cause delay in accessing healthcare and affect health outcomes

As our healthcare system has moved from a paternalistic model of healthcare towards a patient-centred model, where patients have greater control and autonomy over their medical decisions, it is vital for members of our society to have adequate health literacy. Health literacy refers to individuals' ability to comprehend, evaluate and apply information about health and healthcare to decisions regarding their personal healthcare.^{9 10} The Adult Literacy and Life Skills survey conducted by the Australian Bureau of Statistics found that approximately 60% of the Australian population had low health literacy.¹¹ This report found that health literacy was higher in individuals who were more educated, aged 20–44, who came from an English-speaking background and those without disabilities.¹¹ Health illiteracy can result in poor health outcomes due to delay in accessing care.¹² One of the most pervasive factors contributing to this delay in presentation among men is the paradoxical notion of archaic masculinity.^{13 14} The pursuit of affirming this sense of masculinity causes men to engage in risk-taking behaviours that contribute to adverse outcomes. This sense of masculinity then prevents men from seeking medical assistance, when their

risk-taking behaviours lead to negative outcomes, as they believe seeking medical advice is a form of weakness that threatens their sense of masculinity and embarrasses them.¹⁴ As such, men are more likely to delay seeking medical advice, which contributes to poorer health outcomes in men.^{13 14}

Cultural and social stigma can delay presentation

Fear of embarrassment and judgement commonly results in patients avoiding seeking medical assistance. When there is a sexual component to their presenting complaint and/or if their presentation is associated with perceived deviant behaviour, these fears are greatly exacerbated, creating further impediment to pursuing medical assistance, leading to worse outcomes.¹⁵ In the cases of urethral foreign body insertion, embarrassment is consistently cited as a primary reason for a delay in seeking medical assistance.^{15–17} In most situations of foreign body insertion into the urethra, curative management would include an endoscopic procedure and a course of antibiotics.^{16 17} However, when presentation is delayed more invasive procedures may be required, as was the case in Moon *et al*'s¹⁶ case report. In their report they describe a patient who presented 1 week following insertion of multiple foreign bodies into the urethra.¹⁶ As a result of this delay the initial endoscopy procedure to remove the foreign bodies was unsuccessful as the foreign body had formed a bladder stone and was adherent to the bladder wall.¹⁶ As such a follow-up cystolithotomy was planned and a midline incision on the bladder was made.¹⁶ This is similar to Moon *et al*'s example, in this case report the patient underwent a number of invasive procedures, which may have been prevented if there was an earlier presentation to health services. In contemporary literature, delayed presentation following insertion of a foreign body into the urethra has been found to also result in sepsis and fistula formation.¹⁷

Rural and remote healthcare in Australia: barriers to reaching health facility and receiving appropriate treatment

Healthcare in Australia can be classified based on remoteness given the vast total area of Australian land. There are three main classification systems used by the Australian Institute of Health and Welfare (AIHW): (1) the Australian Standard Geographical Classification Remoteness Areas (ASGC-RA) classification; (2) Rural Remote and Metropolitan Areas (RRMA) classification; and (3) Accessibility/Remoteness Index of Australia.¹⁸ The patient in this case lived in Nambour, Queensland, Australia, which is classified as an 'Inner Regional' area according to the ASGC classification, and considered a 'large rural centre' according to the RRMA classification. A report by the AIHW compares the determinants of health among men in major cities with those outside of major cities, and concludes that overall

there is a higher tendency for self-reliance and reluctance to seek care among rural men. Mortality rates due to injury in inner regional areas compared with major cities were significantly higher.¹⁹

A study on necrotising soft tissue infections (NSTIs) conducted at a tertiary hospital in Melbourne shows that less than 70% of the patients referred to the tertiary hospital for NSTIs have had surgical debridement prior to referral.²⁰ About 17% of all patients with NSTI had gangrene of their genitalia. Although often there are hospitals available in inner regional areas, they lack adequate resources for the management of conditions such as NSTIs, including Fournier's gangrene. Part of the issue is a lack of human resources in inner regional areas compared with major cities. While 34% of Australians live outside of major cities, only 23% of medical specialists work outside of major cities.²¹

Given the aforementioned morbidity and mortality associated with Fournier's gangrene, it was appropriate that ongoing care be conducted at a tertiary centre where medical services exist in a larger capacity and with greater accessibility than regional hospitals. Importantly in this case, the major city hospital to which the patient was transferred acts as a tertiary referral centre for urology, intensive care and infectious disease patients. Additionally it staffs 10 visiting urology consultants, including a recognised leader in the management of perineal diseases and reconstructive surgery, and provides a 36-bed intensive care unit.

Three-delay model

Applying the framework of the three-delay model, this case highlights the delays in seeking appropriate management for Fournier's gangrene, a urological emergency (figure 4). Phase 1 of the delay model is delay in decision to seek care. Phase 2 is delay in identifying and reaching medical facility, and finally phase 3 is a delay in receiving adequate and appropriate treatment. The social determinants that caused phase 1 of the delay are health illiteracy, education in general, and the cultural factors that cause embarrassment in accessing care. The patient waited for 8 days before deciding to go to a doctor because (1) he did not recognise the seriousness of his condition, (2) he wanted to 'hide it' from his partner and (3) he was embarrassed given the sexual nature of his complaint. Phase 2 of the delay can be attributed to a variety of different reasons. First, the patient did not access his GP regularly and therefore did not present to his GP sooner for pain relief. Given that the patient's local hospital was only 1 km away from his home, there was very little delay in reaching the medical facility once the patient identified it. Finally, the third phase of the delay model is adequate diagnosis and early treatment. Given the lack of adequate resources at an inner regional hospital, the diagnosis and early surgical debridement of the

Figure 4 An illustration of the three-delay model in seeking medical assistance.

patient's Fournier's gangrene were delayed. However, the timely referral to the tertiary centre in a major city followed by prompt surgical debridement resulted in an overall positive outcome for the patient.

Learning points

- Fournier's gangrene is a urological emergency that can result in death.
- Access to healthcare can be difficult in developed nations such as Australia given the vast geographical distances.
- Gender, social stigma and health illiteracy can cause delays to present to the hospital.

Contributors MJ was instrumental in conceiving the idea and initial outline. She drafted the article primarily and prepared and approved the final draft. KP was also part of the initial implementation of the idea and was mainly responsible for background research, editing the drafts and critically revising the content. WY did the background research for the paper and revising the content of the manuscript. ND supervised the project, was the treating clinician of the patient, provided pictures and revised the final drafts. MJ, KP, WY and ND approved the final version of the manuscript. All authors are accountable for the article and responsible for the accuracy and integrity of the article.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Pais VM. *Fournier gangrene*. Medscape. <http://emedicine.medscape.com/article/2028899-overview> (accessed 19 Mar 2017).
- 2 Sorensen MD, Krieger JN. Fournier's gangrene: epidemiology and outcomes in the general US population. *Urol Int* 2016;97:249–59.
- 3 Singh A, Ahmed K, Aydin A, et al. Fournier's gangrene. A clinical review. *Arch Ital Urol Androl* 2016;88:157–64.
- 4 Mallikarjuna MN, Vijayakumar A, Patil VS, et al. Fournier's gangrene: current practices. *ISRN Surg* 2012;2012:1–8.
- 5 Thwaini A, Khan A, Malik A, et al. Fournier's gangrene and its emergency management. *Postgrad Med J* 2006;82:516–9.
- 6 Australian Government, Department of Health. *MBS online: medicare benefits schedule*. Australia: Australian Government, Department of Health Web Site, 2017. <http://www9.health.gov.au/mbs/search.cfm?q=gangrene> (accessed 2 Apr 2017).
- 7 Australian Government, Department of Human Services. *Medicare australia statistics*. Australia: Australian Government, Department of Human Services, 2017. http://medicarestatistics.humanservices.gov.au/statistics/do.jsp?_PROGRAM=%2Fstatistics%2Fmbs_item_standard_report (accessed 2 Apr 2017).
- 8 Widjaja AB, Tran A, Cleland H, et al. The hospital costs of treating necrotizing fasciitis. *ANZ J Surg* 2005;75:1059–64.
- 9 Australian Commission on Safety and Quality in Health Care. *Health literacy: taking action to improve safety and quality*. Sydney: Australian Commission on Safety and Quality in Health Care, 2014. <https://www.safetyandquality.gov.au/wp-content/uploads/2014/08/Health-Literacy-Taking-action-to-improve-safety-and-quality.pdf>
- 10 Berkman ND, Sheridan SL, Donahue KE, et al. Health literacy interventions and outcomes: an updated systematic review. *Evid Rep Technol Assess* 2011:1–941.
- 11 Australian Bureau of Statistics. *4228.0 - Adult literacy and life skills survey, summary results, Australia, 2006 (Reissue)*. Australia: Australian Bureau of Statistics. [http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/4228.0Main%20Features%202006%20\(Reissue\)?opendocument](http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/4228.0Main%20Features%202006%20(Reissue)?opendocument) (accessed 4 Apr 2017).
- 12 Levy H, Janke A. Health Literacy and Access to Care. *J Health Commun* 2016;21(Suppl 1):43–50.
- 13 Smith JA, Braunack-Mayer A, Wittert G. What do we know about men's help-seeking and health service use? *Med J Aust* 2006;184:81–3.
- 14 Galdas PM, Cheater F, Marshall P. Men and health help-seeking behaviour: literature review. *J Adv Nurs* 2005;49:616–23.
- 15 Unruh BT, Nejad SH, Stern TW, et al. Insertion of foreign bodies (polyembolokoilamania): underpinnings and management strategies. *Prim Care Companion CNS Disord* 2012;14:f01192.
- 16 Moon SJ, Kim DH, Chung JH, et al. Unusual foreign bodies in the urinary bladder and urethra due to autoerotism. *Int Neurourol J* 2010;14:186–9.
- 17 Mahadevappa N, Kochhar G, Vilvathay KS, et al. Self-inflicted foreign bodies in lower genitourinary tract in males: Our experience and review of literature. *Urol Ann* 2016;8:338–42.
- 18 Australian Institute of Health and Welfare. *Remoteness classifications*. Canberra: Australian Institute of Health and Welfare. <http://www.aihw.gov.au/rural-health-remoteness-classifications/> (accessed 15 Apr 2017).
- 19 Australian Institute of Health and Welfare. *A snapshot of men's health in regional and remote Australia. Rural health series no. 11. Cat. no. PHE 120*. Canberra: Australian Institute of Health and Welfare. <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6442459963> (accessed 15 Apr 2017).
- 20 Proud D, Bruscino Raiola F, Holden D, et al. Are we getting necrotizing soft tissue infections right? A 10-year review. *ANZ J Surg* 2014;84:468–72.
- 21 Murray RB, Wronski I. When the tide goes out: health workforce in rural, remote and Indigenous communities. *Med J Aust* 2006;185:37–8.

Copyright 2017 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow