

CASE REPORTS

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First reported case of penile prosthesis infection from brucellosis: case report

Nabil N. Moohialdin^{1*} , Ahmad Shamsodini¹, Steven K. Wilson², Osama Abdeljaleel¹, Ibrahim Alnadhari¹ and Ausama Saadi Abdulmuhsin¹

Abstract

Background: Infection after the penile prosthesis can be devastating to both the patient and surgeon with various complications and consequences. After introduction of antibiotic-coated implants, the rate of infection has dramatically decreased, but still we see uncommon organisms causing infection. We present a first case report of penile prosthesis infection by brucellosis due to raw milk ingestion. To our knowledge, this is the first reported case of brucellosis penile prosthesis infection.

Case presentation: We present a first case report of penile prosthesis infection by brucellosis due to raw milk ingestion. A 75-year-old, diabetic male patient presented with penile prosthesis infection 5 months post-penile exchange surgery due to mechanical malfunctioning of 2-piece penile prosthesis which was inserted 11 years ago. The initial treatment with broad spectrum antibiotics did not subside the infection. After diagnosis of brucellosis, the antibiotic was changed to anti-brucellosis (Rifampicin + Tetracycline). The patient improved dramatically and was discharged home with smooth follow-up course.

Conclusion: Brucellosis can cause infection of penile prosthesis and can be treated with anti-brucellosis antibiotics without necessitating surgical intervention and removal of prosthesis.

Keywords: Brucellosis, Penile prosthesis infection, Penile prosthesis complications

1 Background

Post-penile prosthesis infection has reduced dramatically since the introduction of the antibiotic-coated prosthesis and hydrophilic prosthesis and irrigation of the prosthesis components with the antibiotics of choice. In spite of that, we still see infection with rare organism that will cause devastating result on the corporal tissue that necessitates removal of implant and fibrosis of the corpora that will result in complicating the replacement surgery.

Here, we present a first case report of delay infection of prosthesis with *Brucella* organism that was successfully treated with *Brucella*-sensitive antibiotics without the need of removing of the prosthesis.

2 Case presentation

A 75-year-old diabetic male presented to urology clinic complaining of mechanical malfunctioning of 2-piece penile prosthesis which was inserted on 2007. Patient developed colon cancer and underwent laparoscopic resection of colon in 2015 followed by chemotherapy for one year. He was considered in remission, and there was no contraindication for penile prosthesis exchange after oncologic clearance was granted. Standard preparation for penile prosthesis exchange was done including full history, clinical examination including inguinal region to exclude inguinal hernia, and local examination for external genitalia looking for penile and scrotal skin to exclude any skin infections, boil, rash or open wound. Removal of the 2-piece prosthesis and substitution of a 3-piece inflatable prosthesis were performed with antiseptic solution washout of the implant spaces. The patient had smooth postoperative period and discharged on the first

*Correspondence: dr.nabilalhajj@gmail.com

¹ Urology Department, Al-Wakra Hospital, Hamad Medical Corporation, Al Wakrah, Qatar

Full list of author information is available at the end of the article

postoperative day on broad spectrum antibiotics after partial deflation of penile prosthesis and instructed not to inflate the device for 4 weeks and to resume sexual intercourse 6 weeks later.

The patient's postoperative follow-up was smooth with no complications, and the wound healed uneventfully. At 4 weeks, he was trained in prosthesis operation and cleared for use of the prosthesis.

After an additional 5 months of time, the patient presented to emergency department complaining of painful scrotal swelling and inability to inflate prosthesis due to tenderness with mild dysuria without history of fever. Physical examination found normal vital signs, and local examination showed scrotal wall thickening, redness, and increased warmth. Notably, the pump was tethered to the most dependent area of scrotum (Figs. 1 and 2).

The patient urgently admitted to the urology ward for assessment of possible penile prosthesis infection, and laboratory and imaging studies were requested. Parenteral broad spectrum antibiotics were given. Laboratory

values were normal apart from high C-reactive protein 99 (WBC 8.8, ESR 61, serum creatinine 96Mmol/l, HbA1c 8.1%, urine microscopy showed leukocytes 10 with no growth urine culture).

Scrotal US demonstrated that approximately 4.4 × 2.4 × 2.1 cm sized collection with dense echoes is seen at the proximal aspect of scrotal portion of the prosthesis. Collection is seen to extend over the prosthesis to distal aspect of the scrotum with a maximum thickness of 10 mm. No evidence of collection was seen in penis. Diffuse scrotal wall edema is seen. Both testis and epididymis appear normal. Minimal free fluid is seen in both tunica vaginalis sacs (Figs. 3 and 4).

The patient did not improve clinically after 4 days of antibiotic therapy. He was still complaining of scrotal pain, tenderness, and swelling and, furthermore, increasing trend of C-reactive protein level but afebrile throughout.

Pelvic and penis MRI demonstrated that significant soft tissue enhancement was seen in scrotal soft tissue,

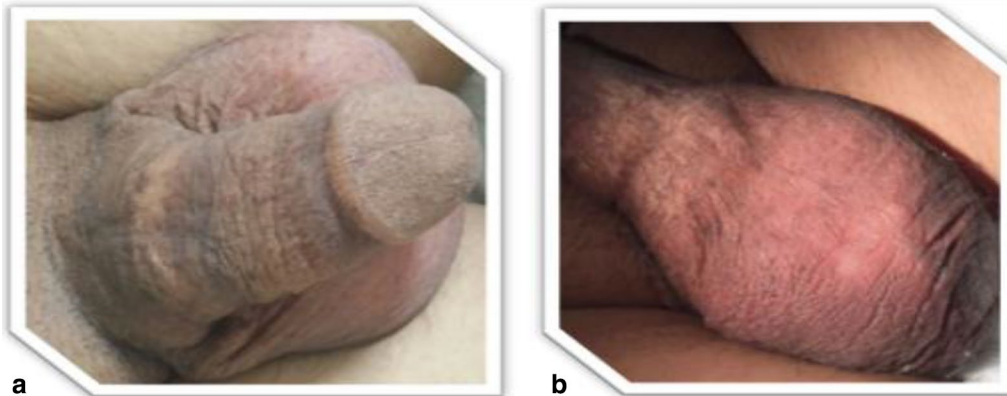


Fig. 1 Sign of infection, redness and edema of penile shaft (a) and scrotal wall (b), tenderness around the pump and at the site of reservoir

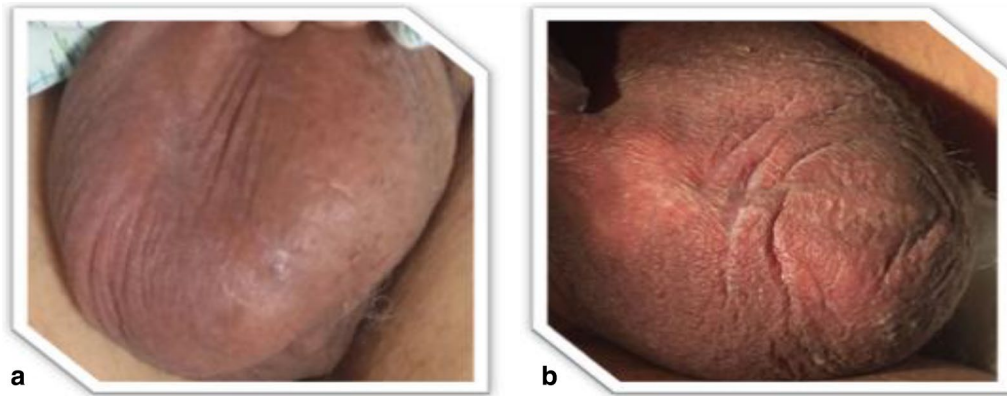


Fig. 2 Redness and edema of the scrotal wall before (a) and after (b) the anti-brucellosis treatment

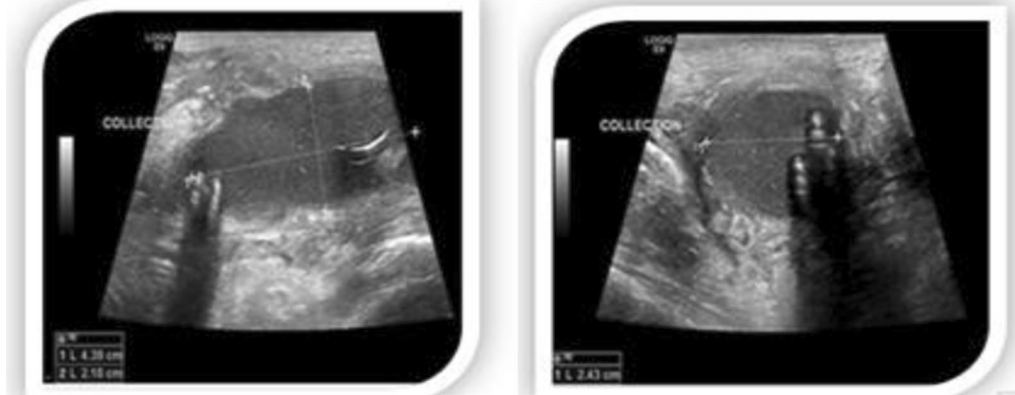


Fig. 3 Ultrasound picture showing collection around the reservoir



Fig. 4 Ultrasound picture showing collection around the pump and cylinders

tunica albuginea, around the pump and prosthesis which is likely representing ongoing infective process (Fig. 5).

The patient had not mentioned that he had contracted brucellosis infection during a trip to Saudi Arabia one and half months ago. It was reported later when his family provided documentation. Blood sample for brucellosis titers was taken. At the time of admission, patient had received incomplete treatment for brucellosis. With all these new findings beside that imaging was not convincing of an abscess formation and after consulting infectious disease team, the patient was considered as a brucellosis relapse and treated accordingly with anti-brucellosis antibiotics (Rifampicin + Tetracycline).

After 48 h of starting brucellosis-specific antibiotics, there was a dramatic clinical improvement in pain and complete resolution of scrotal swelling. After 96 h, the patient was discharged to home on oral antibiotics for 6 weeks with outpatient follow-up in urology and infectious disease clinics. The patient is presently infection free 1 year later. Recent control scrotal US showed no

more fluid collection noticed, normal both testes and epididymis, pump and reservoir seen without radiological picture of inflammation around them. The patient and family were happy with the management approach which preventing him from surgical intervention with related risk of anesthesia at this age, in addition to financial sequelae of penile prosthesis removal and implantation later on once, and he wrote official appreciation letter and compliment feedback through patient and visitor service center.

3 Literature review and case discussion

PubMed and Google Scholar were searched for articles relating to brucellosis causing penile prosthesis infections. Not a single article was located. All published articles describe genital complications of brucellosis infection as scrotal infection, epididymitis, and/or orchitis from medical point of view.

Brucellosis is the most common bacterial infection from animals worldwide with higher incidence rate in the

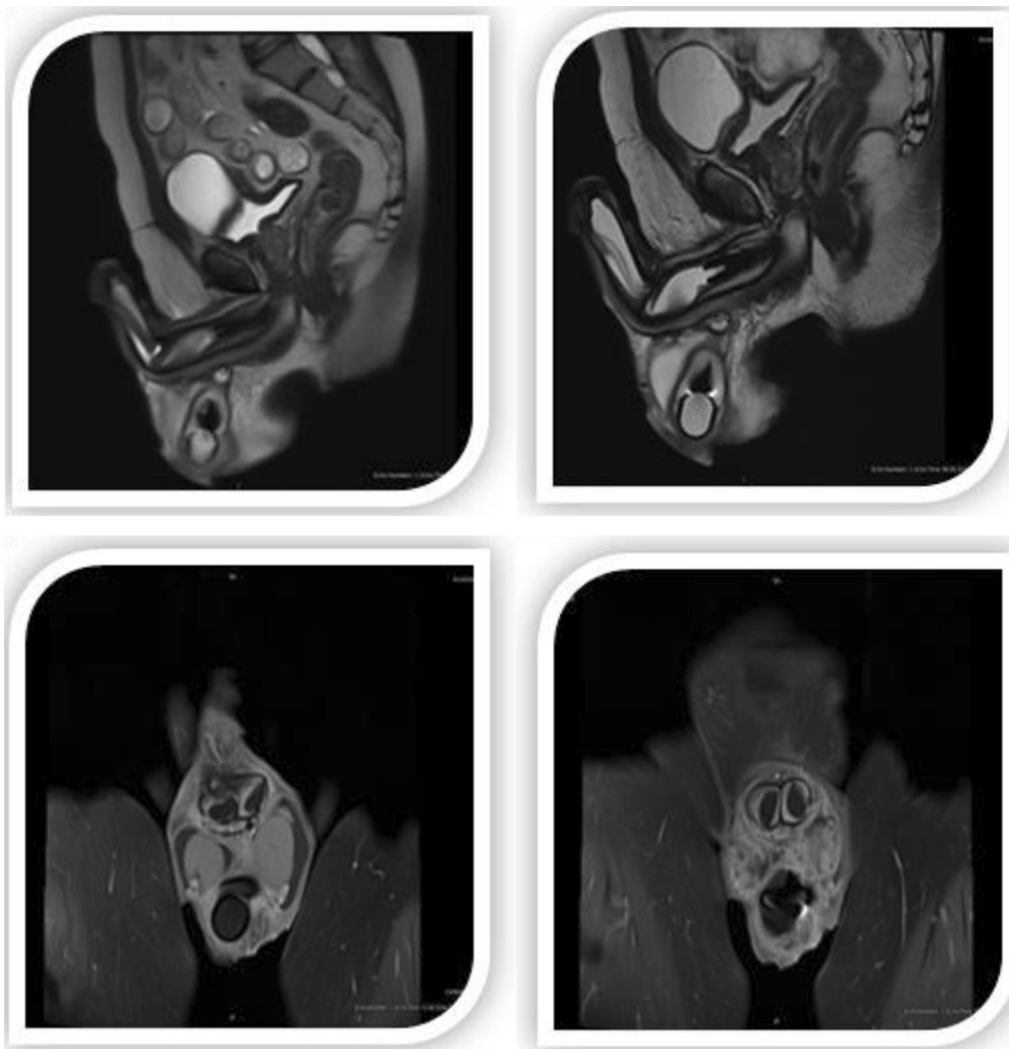


Fig. 5 MRI pictures showing significant soft tissue enhancement seen in scrotal soft tissue, tunica albuginea, around the pump and prosthesis which is likely representing ongoing infective process

Mediterranean region, Arabian Peninsula, Balkan Peninsula, India, and Central and South America [1]. The incidence of human brucellosis in endemic areas varies widely, from <0.01 to >200 per 100,000 population [2].

Brucellosis is caused by Gram-negative bacteria called *Brucella*. There are four out of six species that infect human [1]. Among them, *Brucella melitensis* is currently the most common species that infects human beings. The disease spreads to humans by the ingestion of raw dairy products, the consumption of infected animal meat, and close contact with their secretions and carcasses. Camel milk is considered to be the most common source of the infection in Middle Eastern countries. Moreover, human-to-human transmission of *Brucella* infection has also been reported [3–6].

Brucellosis mainly presents with high fever (sometimes named Malta or undulant fever), myalgia, and arthralgia [7, 8]. Bone and joint involvement and epididymo-orchitis are considered the most frequent complications of brucellosis [9]. In our case, the patient was not having fever, but he reported joint pain. Relapse of brucellosis is often seen because it is an intracellular organism. This was relevant in our patient since he started the oral treatment, but he did not complete it. Diagnosis requires a high degree of clinical suspicion and thorough occupational and travel history. Globalization of business and leisure travel has led to diagnostic challenges in non-endemic areas like the State of Qatar. A definitive diagnosis requires isolation of *Brucella* from blood and bone marrow samples or by detection of antigens and

antibodies to *Brucella* by serological tests. Brucellosis is an important public health problem that can cause serious complications and significant morbidity. All age-groups were susceptible to the infection, and there was an obvious preponderance of males [10, 11]. Consumption of raw milk and milk products and to a lesser extent contact with infected animals or their waste materials are the main routes of infection.

The treatment recommended by the World Health Organization (WHO) for acute brucellosis in adults is rifampicin 600–900 mg and doxycycline 100 mg twice daily for a minimum of 6 weeks [12]. Combination of intramuscular streptomycin (1 g daily for 2–3 weeks) with an oral tetracycline (2 g daily for 6 weeks) gives fewer relapses [13, 14]. Tetracycline monotherapy for 6 weeks is a good option for patients with brucellosis with no focal disease and a low risk of relapse [15].

In our case, initial treatment with broad spectrum antibiotics did not show improvement in the local signs and symptoms of infection. The redness and edema was increasing day by day to the extent that we psychologically prepared the patient for possible removal of penile prosthesis in case that we could not control the infection. After having the important piece of information about brucellosis and shifting to anti-brucellosis antibiotics (Rifampicin + Tetracycline), he dramatically improved without any surgical intervention. In addition to that, imaging was not convincing of an abscess formation, otherwise prompt surgical drainage would have been essential. We do not know how the brucellosis organism is reacting on the biofilm formed around the prosthesis, but by observing our case, the anti-brucellosis has saved the implant.

4 Conclusion

Brucellosis can cause infection of penile prosthesis and can be treated with anti-brucellosis antibiotics without necessitating of surgical intervention and removal of prosthesis. We do not know how the brucellosis organism is reacting on the biofilm formed around the prosthesis, but by observing our case, the anti-brucellosis has saved the implant.

Abbreviation

MRI: magnetic resonance imaging.

Acknowledgements

Not applicable.

Authors' contributions

NNM is the principle investigator and main author who contributed to history and physical examination, data collection, clinical follow-up, literature review, manuscript writing, and patient care during admission and after discharge. AS is a surgeon who did penile prosthesis exchange and contributed to abstract writing, clinical follow-up, and patient care. SW contributed to overseas

consultation while patient was under urology care at our hospital and reviewed the manuscript. OA contributed to clinical follow-up and patient care and discussed the results of imaging study with radiology staff. IA is the first assistant in surgery of penile prosthesis exchange and contributed to clinical follow-up and patient care. AA discussed the laboratory results with laboratory and infection disease team and contributed to clinical follow-up and patient care. All authors read and approved the final manuscript.

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Availability of data and materials

All data and materials available with author and principle investigator (PI) can be reached on reasonable request.

Ethics approval and consent to participate

We got the ethic approval and consent to participate as per strict guidelines of ethics committee in our corporate. MRC—medical research center—at Hamad Medical corporation approved this case study and has the following reference number MRC-04-20-559.

Consent for publication

We obtained the written consent for publication from the participant, in addition to written consent for photography because it contains photographs and radiological images. Proof of consent to publish from study participant can be requested at any time.

Competing interests

The authors declare that they have no competing interests.

Author details

¹ Urology Department, Al-Wakra Hospital, Hamad Medical Corporation, Al Wakrah, Qatar. ² Institute of Urological Excellence, Indio, CA, USA.

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