

Case report of a patient with high flow priapism serving in the Middle East

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All figures courtesy of Dr R Parkinson.

Summary

This report outlines the management of a soldier serving in the Middle East who suffered a perineal injury while on out of theatre leave. He presented to a medical officer when he returned to theatre. Fortunately a urologist was in theatre and the patient was moved forward for review at a United States Army Combat Support Hospital. The diagnosis was established on the basis of blood gas analysis of aspirate from the corpora cavernosa and arrangements were made for the member to be returned to Australia for definitive treatment. He returned to theatre after treatment and completed his tour of duty.

Introduction

Australian Defence Force members serving in the Middle East face significant operational and environmental health threats. The health support is well oriented to dealing with these threats. Occasionally they present with unusual conditions unrelated to the theatre and requiring sub-specialist level care not routinely deployed. The availability of sub specialist opinion is a reflection of the mix of skills of the specialists deployed by countries in more generalist roles. With the dispersal of surgical capability across the theatre, the location of these skills does not follow the traditional levels of medical support. Significant specialist skills may be deployed in the forward health support elements from any country the draw back being that they do not have access to the range of diagnostic support capability that is available in their home location.

Priapism (a prolonged penile erection in the absence of sexual desire¹) is a condition that could have serious long term effects from ischaemia to penile tissue if diagnosis and appropriate management is delayed in some forms. Given the scarcity of resources within a military theatre and the unusual nature of the condition, priapism occurring in a theatre of war presents peculiar challenges to ensure quality care is provided and an acceptable outcome obtained.

History and Examination

A 20 year old male presented to the medical officer at the Australian Defence Force's point of entry in the Middle East theatre of operations 6 days after sustaining a straddle injury to the perineum while on leave. He was due to return to his unit later that week and was concerned that since the accident his penis had remained semi erect. At the time of the injury he had pain and bruising around the perineum. The initial pain settled to a dull ache. He remained able to ejaculate and reported no haematospermia or pain with ejaculation or urination. He also reported he was unable to achieve a full erection. On examination he was walking normally, there was resolving bruising around the perineum and scrotum but no lacerations or skin tears and his prostate and rectal examination were normal. Testes were normal to examination. Urinalysis was normal. He had no other health issues and no significant history of any medical or surgical problems. An ultrasound was reported as normal (Doppler not available) as was a CT scan.

Initial Management

A search of on-line sources by the treating medical officer provided some clues to the management of this unusual presentation. The need for specialist review to confirm the exact nature of the injury was confirmed. Advice was sought through the technical chain of command to see if there was a urologist available in the theatre. A urologist serving in the Middle East in a United States Army combat support hospital was contacted with the history and he agreed to review the patient. As part of the physical exam, corporal cavernosa blood aspirate was analyzed to confirm the suspicion of high flow priapism. The blood gas results are shown in Table 1.

pH	7.399
pCO ₂	39.2
pO ₂	92
HCO ₃	24.2
O ₂ sats	97%

Table 1: Results of blood gases of corporal cavernosa blood at 37°C

The normal pH and normal range room air oxygen and carbon dioxide levels confirmed the diagnosis of high flow priapism. As compared to the urgent nature of treatment for low flow priapism, the non urgent nature of high flow priapism was explained to the patient. Although the soldier was prepared to delay intervention for four more months to serve in the Middle East before returning to Australia, he found walking uncomfortable and was keen to have the condition resolved as soon as possible. The appropriate equipment was not available in theatre so arrangements were made for him to be seen by a urologist in Australia.

Investigations and Treatment

Transperineal Doppler ultrasound demonstrated an injury to the deep artery of the penis, with a fistula between this artery and the corpus cavernosum of the left crus of the penis (see Figure 1).

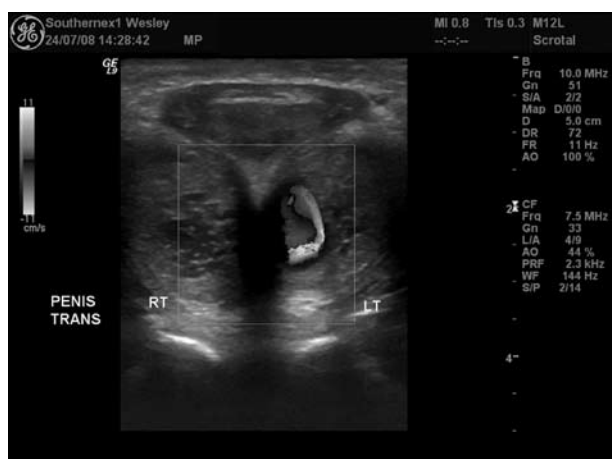


Figure 1:

These findings were better demonstrated on selective angiography of the internal pudendal artery (see Figure 2).

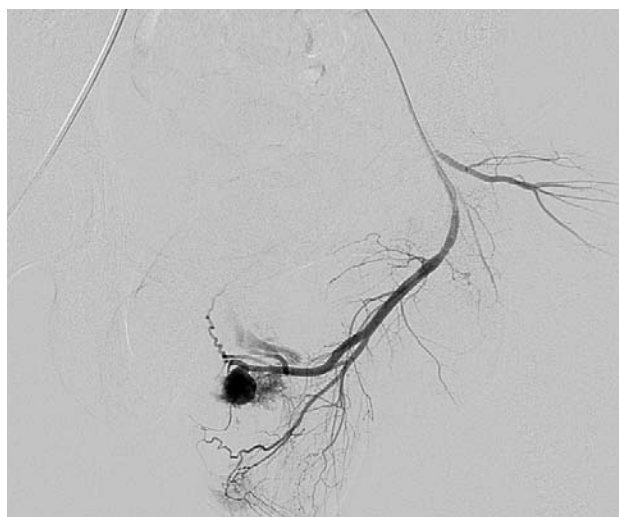


Figure 2:

He underwent embolization of the traumatic arteriovenous fistula with Gelfoam, a non permanent material, that is resorbed within one to two months. The final angiogram and a post procedure ultrasound showed resolution of the arteriovenous fistula (see Figures 3 and 4).

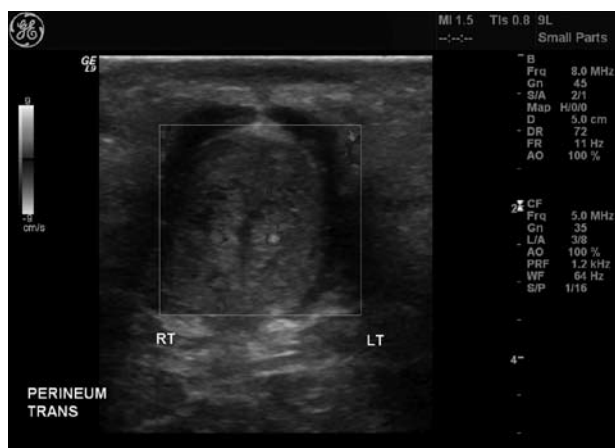


Figure 3 & 4:

He had an uneventful recovery and returned to the Middle East two weeks after the procedure.

Discussion

General: Priapism is a prolonged erection in the absence of sexual desire. The name derives from Priapus a Greek God (son of Zeus and Aphrodite) associated with fertility. To meet the clinical definition the erection should be present for more than four hours however the clinical spectrum includes duration of many months. Pain is common however it is not essential for the diagnosis^{1,2}.

Epidemiology: The epidemiology for the condition is not well articulated because of the issues of misclassification, inaccuracies related to retrospective data collection and cases usually only coming to

attention because of significant pain or an especially long duration of the condition. It has been suggested that the incidence is between 0.5 to 1.5 cases per 100 000 person years (number of patients with first episode of priapism divided by the accumulated amount of person time in the study population)^{1,3}.

Pathophysiology: The pathophysiology of priapism leads to two categories of the condition - low and high flow. Low flow priapism is caused by decreased venous outflow and accompanying venous stasis while high flow conditions are related to an increase in arterial flow generally secondary to a structural injury involving the arterial circulation to the penis. Low flow priapism is a more acute condition because of the potential damage from ischemia related to the venous stasis. Low flow states are associated with various medical conditions such as sickle cell anemia, a range of haemoglobinopathies, parenteral nutrition, haemodialysis, heparin treatment, vasoactive drugs (including erectile dysfunction treatments, hydralazine and chlorpromazine), polycythemia, leukaemias, heparin and spinal cord injury. High flow states are associated with trauma such as straddle injury or intracavernous injection needle laceration, some vasoactive drugs, neurological conditions and penile revascularization surgery^{1,3}. Trauma was the antecedent cause of high flow priapism in 22 out of 27 patients in a Korean multi-centre study⁴.

Diagnosis: Priapism of any sort requires immediate urological attention in order to determine the underlying cause of the condition. The long term sequelae of untreated low flow priapism are corporal fibrosis and tissue necrosis with loss of natural erectile function. There is also the issue of identification of any associated disorder that requires treatment in its own right. The patient's history may provide an indication of any underlying conditions but the major diagnostic test is blood gas sampling from the penile cavernosum. Low flow priapism is diagnosed on the basis of low pH, low oxygen and high carbon dioxide levels indicative of ischemia³. High flow priapism can be diagnosed from a bright red cavernosal sample demonstrating the presence of arterial blood on blood gas analysis⁵.

Treatment: Case descriptions have been reported in the literature in the 19th century although fortunately treatment has moved beyond the treatment described in 1824:

“ . . . Mr Callaway resorted to puncturing the left crus with a lancet, ‘allowing a large quantity of grumous blood be let out’, after 16 days of non surgical management including venesection and leeching. Mr Tripe’s sailor had likewise been bled and had had ‘twenty leeches applied to the perineum. . . Before this he had had cold lotions and rhubarb applied

to the penis along with prescription of tartar emetic, calomel and colocynth”².

Low flow priapism requires urgent management to reduce the risk of long term problems from prolonged ischaemia. It is managed initially with aspiration of the corpora cavernosa using a non heparinised syringe, giving a 30% success rate. This can be combined with flushing with normal saline. If this is not successful, a vasoconstrictive agent (such as phenylephrine) is instilled at five minute intervals until detumescence is achieved. Of note, proper non-invasive monitoring of pulse and blood pressure should be accomplished while treating with vasoactive medications. If done within 12 hours of onset this has been found to be almost 100% effective (for selective conditions). Treatment for any underlying disorders should be started concurrently³.

High flow priapism is not an emergency and can be managed initially with a conservative approach^{1,6}. The longer terms sequelae are not as severe as untreated low flow cases and spontaneous resolution is common. Treatment also carries a risk of post-treatment erectile dysfunction. The alternate is embolisation of either the internal pudendal artery or, if available highly selective embolisation of a minor vessel that has been damaged can be attempted^{1,3,7}.

Conclusion

This case demonstrates the value of networking in a coalition environment in order to get specialist assistance in the management of an unusual case. The presence of a urologist was determined within a day and an appointment with the urologist was arranged within 4 days. The patient was also moved from what might be called a rear echelon position forward to one of the more active parts of the Middle East for the appointment. Had the appropriate treatment been available he would have also had this in theatre.

Priapism is not listed as a health issue for deployment to the Middle East and is an unusual condition at the best of times. This exemplifies the range of conditions military doctors encounter and reinforces the need for good access to clinical information in the form of text books, on line clinical databases and specialist opinion to manage such patients.

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