Case Report

Value of serial ultrasound imaging in conservative management of epididymo-cutaneous fistula in a person with cervical spinal cord injury✩,✩✩

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ABSTRACT

Epididymo-cutaneous fistula was seen in a person with cervical spinal cord injury and neuropathic bladder. This patient developed left epididymitis; then he formed an abscess superficial to the tail of the epididymis, which burst open to the skin discharging pus; subsequently, this progressed to epididymo-cutaneous fistula. A few drops of urine would leak through the fistula. The carers kept a dressing over the fistula to collect the small amount of urine leak and changed the dressing daily. This patient’s carers squeezed any subcutaneous collection and drained the pus through the fistula.

Serial ultrasound imaging of the scrotum was performed to guide the clinical management: (1) any subcutaneous abscess detected by the ultrasound scan was drained promptly; (2) ultrasound scans confirmed absence of any pathology in the testis; (3) the course of the disease was monitored as chronic epididymitis with echogenic debris in epididymal tail progressed to development of epididymo-cutaneous fistula and later to a chronic fistula with a matured tract. The serial scans revealed thickened tail of the left epididymis with heterogeneous echo texture with no abscess formation, which encouraged the continuation of conservative management over a 5-year period while maintaining good quality of life. At the last follow-up in June 2022, leakage of urine from the epididymo-cutaneous fistula was observed very infrequently (once a month).

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Introduction

Epididymo-cutaneous fistula is a rare condition. The etiology may be congenital or acquired following epididymitis, surgery, or trauma [1]. Epididymo-cutaneous fistula has been reported in persons with chronic epididymitis due to Mycobacterium Tuberculosis [2]. We describe a person with tetraplegia, who had chronic epididymitis due to urinary tract infection, and subsequently developed epididymo-cutaneous fistula. Serial ultrasound scans helped to monitor the progress of the disease and guided the clinical management.

Case presentation

A 24-year-old Caucasian male sustained C-5/C-6 tetraplegia following road traffic accident in 1984. He underwent urethrotomy and was maintained on penile sheath drainage. Video-urodynamics, performed 22 years post-injury revealed a normal looking bladder; no vesicoureteric reflux; during detrusor contraction, the pressure went up to 30 cm with no intra-abdominal rise; the patient emptied the bladder to near completion. In conclusion, the patient had got a safe bladder. This patient was taking Baclofen and Terazosin.

Twenty-eight years postinjury, he developed swelling of left tests. Ultrasound scan of the urinary tract revealed normal ultrasound appearance of the kidneys, with no obvious renal calculi and no hydronephrosis, no gross abnormality of the urinary bladder. Ultrasound scan of the scrotum showed small left hydrocele, normal appearance of the left testis measuring 3.5 cm, normal appearance of the head and body of the epididymis, moderate thickening of the epididymal tail with echogenic debris, suggestive of chronic epididymitis (Fig. 1). This patient was prescribed Nitrofurantoin; then Ciprofloxacin 500 mg twice a day for 4 weeks. Following the antibiotic courses, the swelling in the left side of scrotum had gone down. Carers performed intermittent catheterizations twice a day. Cystoscopy performed 32 years postinjury, revealed evidence of urethral sphincterotomy (done 2 years after spinal cord injury), with possible bladder neck incision.

This patient was getting recurrent urinary tract infections; 33 years-postinjury, he developed swelling in the left side of the scrotum. The skin over the front of the scrotum was edematous and red; there was a small opening through which pus was oozing out. Ultrasound scan revealed abscess located superficial to the tail of the epididymis (Fig. 2). Ciprofloxacin by mouth was prescribed for the presumed diagnosis of orchitis. The carer was able to squeeze and drain the pus and apply dressing. A few drops of urine would leak out. This patient kept a dressing to collect the small amount of urine leak and changed the dressing daily.

Two months later, a small amount of discharge continued to drain through a 3 mm hole. Ultrasound scan revealed eight mm hypoechoic tract extending from the tail of the epididymis to the subcutaneous tissues of the scrotum (Fig. 3A and B). The testis was of normal echotexture. The dose of Terazosin was increased from 2 mg to 3 mg a day and then 4 mg a day. Terazosin reduces intraurethral pressure and thereby, the risk of retrograde flow of urine from the urethra via the ejaculatory ducts to the vas deferens and epididymis. Antimuscarinic drugs to reduce intravesical pressure, and thereby the risk of retrograde flow of urine via the ejaculatory ducts to the epididymis was considered. This patient depended upon reflex voiding as carers were not available to perform intermittent catheterizations. As antimuscarinic drug could interfere with reflex voiding, it was not prescribed.

Ultrasound scan of left epididymis, performed 2 months later, showed a small linear hypoecholic tract on left side extending from the tail of left epididymis toward the scrotal wall which measured 10 mm in length (Fig. 4A and B). Carers continued to squeeze and drain very small amount of discharge from the fistula. Ultrasound scan of left epididymis, performed seven months later, showed the small linear hyperechoic tract with the small inflammatory focus at the end of the track. No underlying focal abscess or collection is noted (Fig. 5). Carers continued local dressing as part of routine care. The patient felt very well in himself.

Seven months later, there was only tiny amount of discharge from the fistula. The patient was feeling fine; he preferred to continue with daily dressing. Carers would squeeze the area, get all discharge out, keep the opening of the fistula patent and prevent any collection; the skin around the fistula was not red or inflamed or swollen; no swelling. Ultrasound scan of left epididymis showed approximately 12-mm long tract extending from around the tail of the left epididymis to the skin surface (Fig. 6A and B). Seventeen months later, the scrotum was back to “normal”. Carers continued to get all discharge out, keep the opening of the fistula patent and prevent any collection. Ultrasound scan revealed a clearly defined epididymo-cutaneous fistulous tract measuring 1.7 mm in diameter (previously the fistula was 1.2 mm in diameter).
Fig. 2 – Ultrasound scan of the scrotum shows abscess within the left scrotum containing echogenic debris. The abscess is located superficial to the tail of the epididymis.

Fig. 3 – (A and B) Ultrasound scan of left epididymis and testis, performed 2 months after Figure 2, shows an 8 mm hypoechoic tract extending from the tail of the left epididymis to the subcutaneous tissues of the scrotum. Normal echotexture of the left testis, which measures 3.7 cm.

The features suggested that the fistulous tract was maturing (Fig. 7A and B).

Eight months later, the patient developed swelling of left testis; no swelling at the site of the epididymo-cutaneous fistula. He was prescribed Ciprofloxacin 500 mg BD for 7 days. Nineteen months later, the patient was doing well. Leakage of urine from the epididymo-cutaneous fistula was observed very infrequently (once a month). The fistula remained “dry” for long periods; there was no swelling.

During the conservative management of epididymo-cutaneous fistula, the wound swabs taken from the opening of the fistula showed growth of Methicillin-resistant Staphylococcus aureus, and coliform species. We decided against administering antibiotics to treat the organisms grown from the dis-
Fig. 4 – (A and B) Ultrasound scan of left epididymis, performed 2 months after Figure 3, shows a small linear hypoechoic tract on left side extending from the tail of left epididymis toward the scrotal wall, measuring 10 mm in length. The tract ends in a small inflammatory focus in the scrotal wall measuring 10 mm × 5 mm. No focal collections noted. Diffuse thickening of the left scrotal wall noted.

Discussion

Ultrasound imaging of the scrotum is a valuable tool in assessing scrotal pathology in persons with spinal cord injury. The development of epididymo-cutaneous fistula was documented by serial ultrasound scans in this patient. The findings of ultrasound imaging of the scrotum guided the plan of treatment.

The underlying principle in management of epididymo-cutaneous fistula was to relieve high intravesical and intravesical pressure and prevent urine reflux via the ejaculatory ducts and vasa deferens into the epididymis [3]. Following discussion with the patient, a shared decision was made towards conservative management, which included regular dressing,
Fig. 5 – Ultrasound scan of left epididymis, performed seven months after Figure 4, shows the small linear hyperechoic track persists with the small inflammatory focus at the end of the track. No underlying focal abscess or collection is noted.

Drainage of the discharge, keeping the ostium of the fistula open, and avoiding accumulation of the discharge inside. The most important component of conservative management was regular ultrasound imaging of the scrotum to monitor the course of epididymo-cutaneous fistula and detect any complications.

So long as the discharge was drained and clean dressing applied daily, risk of symptomatic infection was negligible. If the patient developed repeated symptomatic infections and required antibiotics, or the episodes of infection affected the quality of life, or the ultrasound scans revealed abscess in the testis or epididymis, or the urine leak was profuse or unmanageable, the plan of management would be reconsidered including the option of surgical excision of the fistula and the epididymis.

In a person with neuropathic bladder and epididymo-cutaneous fistula, medical treatment to relieve high intravesical and intraurethral pressure is vital. In the case reported by Bansal and Noh [3], excision of the fistula was performed. However, at a 15-month follow-up after the procedure, urodynamic study was still consistent with a non-compliant detrusor. Physical examination revealed recurrence of the epididymo-cutaneous fistula.

Our case illustrates the value of serial ultrasound scans in diagnosis and management of epididymo-cutaneous fistula in a person with tetraplegia. The findings of serial ultrasound scans performed by an experienced Radiologist guided the clinical decisions made during conservative management over the 5-year period. Patient and his partner, carers, and community health professionals played a vital role in implementing the conservative management of the epididymo-cutaneous fistula, thus illustrating the value of shared decision making in long-term care of spinal cord injury persons.
Fig. 6 – (A and B) Ultrasound scan of left epididymis, performed seven months after Figure 5, shows the persistent tract approximately 12-mm long extending from around the tail of the left epididymis to the skin surface. The tail of the left epididymis is thickened with heterogeneous echo texture. Small amount of fluid is present around the tail.
Fig. 7 – (A and B) Ultrasound scan of left testis and epididymis, performed 17 months after Figure 6, shows no significant pathology in the left testis. Relative enlargement and reduced echogenicity of the tail of the left epididymis persist as seen previously. The epididymo-cutaneous fistulous track is more clearly defined on the current examination. Currently, the fistula measures 1.7 mm in diameter (previously the fistula was 1.2 mm in diameter). There is a small well-defined cavity containing fluid in the thickened scrotum. These features suggest that the fistulous tract is maturing.
Patient consent

We confirm that written, informed consent for publication of their case was obtained from the patient.

Author contributions

VS wrote the draft; all authors reviewed the final manuscript.

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REFERENCES

[1] Weiner DM, Lowe FC. Epididymocutaneous fistula in a patient with the acquired immunodeficiency syndrome and Marfan’s syndrome. Urology 1996;47(5):766–8 PMID: 8650883. doi:10.1016/s0090-4295(96)00024-6.

[2] Weisenberg SA, Yan QR. Tuberculosis epididymitis complicated by a cutaneous fistula. BMJ Case Rep 2017;2017 bcr201721346PMID: 29127136; PMCID: PMC5695325. doi:10.1136/bcr-2017-21346.

[3] Bansal D, Noh P. Epididymocutaneous fistula in a patient with neurogenic bladder. J Pediatr Surg Case Rep 2013;1:94–5. doi:10.1016/j.epsc.2013.03.017.