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Iatrogenic hypospadias – A preventable injury?

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Iatrogenic hypospadias is a preventable injury to the ventral male urethra produced by the downward pressure of an indwelling urethral catheter. In spite of avoiding long-term urethral catheterisation, we have acquired 16 patients with this injury in the last 9 years either in our unit or discovered in patients referred to our unit. Although not a life endangering complication, the majority of such patients find the penile appearance so produced unacceptable. We have reconstructed any penis that has more than meatal cleavage in a total of six patients, with good results. The majority of patients have been fully investigated so that an alternative therapy to catheterisation may be provided. Where possible a catheter free state has been achieved. If not, a suprapubic catheter has been inserted. Those not reconstructed were due to reasons of ill health, and in two instances, due to patient choice.

Keywords: Iatrogenic hypospadias; cleavage; spinal cord injury; catheter; spina bifida; reconstruction

Introduction

Long-term indwelling urethral catheters are responsible for a number of well-recognised complications which are reported in the literature. These include a. mechanical - bladder and peritoneal perforation,[1,2] urinary leakage[3] b. infectious - cystitis, prostatitis, epididymitis, urethritis and periurethral abscess[4,5] c. calculi and encrustations[6,7] d. catheter complications - knotting[8] and fracture[9] e. stricture formation, f. urethral damage[10,11] g. cellular toxicity from catheter[12,13] h. malignancy associated with catheters.[14–16] This list is extensive but by no means exhaustive. In addition to the well recognised complications, indwelling catheters produce additional social and physical problems. Penile and urethral pain may be experienced in patients with normal sensation and the problem of the prevention of normal sexual activity is often ignored by the profession.

There is little reported about the incidence of catheter induced iatrogenic hypospadias. Barnes-Snow *et al*[10] reported similar injuries in three elderly demented patients (1985) and Larsen and Hansen (1989)[11] reported two cases of longitudinal cleavage of the penis in paraplegic patients due to ischaemic necrosis of the urethral wall from catheter trauma.

We have seen 16 patients with this condition over the last 9 years within our spinal cord injury population of about 800 male patients, and in a group of tertiary referred patients with other neurological dysfunction. The extent of injury is variable with most minor abnormality being that of a ventral meatal hypospadias, to the most major of complete penoscrotal cleavage (Figure 1a, b). Although not a life-threatening condition, the cleaved penis has a dramatic appearance and causes both psychological and physical distress to the patient. This condition also interferes with options for urinary bladder management such as application of a condom drainage system and makes clean intermittent catheterisation difficult.

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Patients and methods

Sixteen male patients with an age range of 19 to 100 years (mean 49.7 years) have presented over the last nine years with iatrogenic hypospadias. Their primary diagnosis together with the time interval between urethral catheterisation and recognition of urethral injury are shown in Table 1. The majority of these patients had an underlying neurological abnormality as the primary pathology. Those with an abnormal detrusor function were being treated by indwelling catheterisation for long term management as a 'stop gap' measure whilst awaiting definitive or alternative therapy. This complication has also occurred in four neurologically normal and elderly males with urinary retention or incontinence treated with urethral catheterisation. The time interval between initial catheterisation and the recognition of injury varied between from as little as 1 month to 16 years. It is not clear how long many of these injuries had been present as it was often the case that neither the patient nor assistants were

Figure 1 (**a**, **b**) Degrees of Iatrogenic hypospadias caused by the presence of a long-term catheter (a) Coronal; (b) Mid-penile

aware of the damage but the injury came to light when urethral catheterisation became a problem for a variety of reasons. One man, aged 20, had been treated with indwelling catheters for 8 years. His catheters had been changed on a regular basis by district nurses but the urethral damage only became apparent whilst he was in hospital for a spinal fusion and the hypospadias was only obvious when the foreskin was retracted (Figure 2).

Results of management

Penile repair has been carried out in six out of 16 patients. The results from repair are very gratifying as the penis returns to its normal appearance. An alternative to long-term urethral catheterisation was adopted (Table 2).

The repair procedure requires separation of the site of the urethra and penile skin. Any unhealthy skin is excised. The urethra is repaired in a single layer of continuous dexon sutures and the glans reconstructed. The penile skin is mobilised and a two layer closure achieved over the reconstructed urethra (Figure 3a, b). A stent is left in the urethra for 5 days and a suprapubic catheter for 14 days unless it is being placed for long term drainage.

One patient had a malleable penile prosthesis inserted at the time of reconstruction, two others are awaiting reconstruction, whilst the remaining patients were not repaired for reasons of poor health or by choice. Of this group, two patients opted to continue with their indwelling catheters. In all cases the repairs have healed without leakage or stricture. One patient had a skin tag on the reconstructed glans which was removed at subsequent cystoscopy.

Follow-up for those reconstructed ranges from 4–9 years and continues. Subsequent alternative therapies for voiding dysfunction involves urethral and non urethral procedures, adapted to individual circumstances. These included sphincterotomy and condom drainage, clean intermittent catheterisation, suprapubic catheter and reflex voiding (Table 2). One patient developed a minimal re-cleavage within a month when a urethral catheter was reinserted for urinary incontinence without our knowledge.

Discussion

Iatrogenic hypospadias is an apparently uncommon clinical condition. It is however not recognised unless it is actively sought and there are likely to be many patients with this condition who are being managed with indwelling catheters. Urethral catheterisation has a tendency to produce urethral injury not only because of the irritation caused by the presence of the catheter but because of downward pressure of the catheter on the delicate urethral meatus and the ischaemic effect it produces. The presence of peri-urethral infection/abscess would seem to aggravate this condition as was the case with the patient whose sub-coronal hypospadias became peno-scrotal within a week. He had had a total of 1 month catheterisation. Correct catheter positioning ie securing the catheter to the patient with tape and ensuring the drainage system is properly supported without traction is essential if this complication is to be avoided. Long-term indwelling

catheterisation must produce a high risk of this complication developing in any patient over time and for this reason we recommend that any patient who is considered for long-term catheterisation should be provided with suprapubic catheter and drainage system.

When cleavage occurs, it could be argued that this non-life threatening condition could be left alone

Table 1 Details and management of patients suffering iatrogenic hypospadias

	Diagnosis	*Age*	*Time with urethral cath. to presentation with hypospadias*	*Location of Neo-meatus*	*Management Option*
1	Spina bifida	20	16 mths	Penoscrotal	1° repair
2	Spinal bifida	47	2 yrs	Mid-penile	1° repair
3	Spina bifida	19	36 mths	Peno-scrotal	1° repair
4	T8 cord injury	26	2 yrs	Coronal	Urethral cath
5	C8/T1 cord injury	27	7 yrs	Mid-penile	1° repair
6	C6 cord injury	35	16 yrs	Coronal	1° repair
7	T10 cord injury	73	3 yrs	Peno-scrotal	Urethral cath
8	C5/6 cord injury	22	14 mths	Meatal	S/P cath
9	T5 cord injury	42	10 yrs	Peno-scrotal	S/P cath
10	Lymphoma/radiotherapy	62	1 mth	Coronal	Sphinct./condom
11	Dissem. encephalitis	20	6 yrs	Peno-scrotal	1° repair
12	Parkinson's Disease	75	?	Coronal	S/P cath
13	Retention (cystoscopy)	90	8 mths	Coronal	S/P cath
14	Retention (?cause)	100	?	Coronal	S/P cath
15	Retention (Dementia)	93	?	Coronal	S/P cath
16	PostOp. for Scoliosis	13	6 wks	Coronal	S/P cath

Table 2 Subsequent alternative therapies in reconstructed patients

	Age	*Alternative therapy*
1	20	Ileal Conduit
2	47	Suprapubic catheter
3	19	Colocystoplasty + Mitrofanoff
6	35	Sphinc. + Condom; now Reflex voiding + b.d. CISC
5	27	(Penile Implant) + CISC ± Condom
11	20	Suprapubic Catheter

Figure 2 Iatrogenic hypospadias in uncircumcised patient only recognised after retraction of prepuce

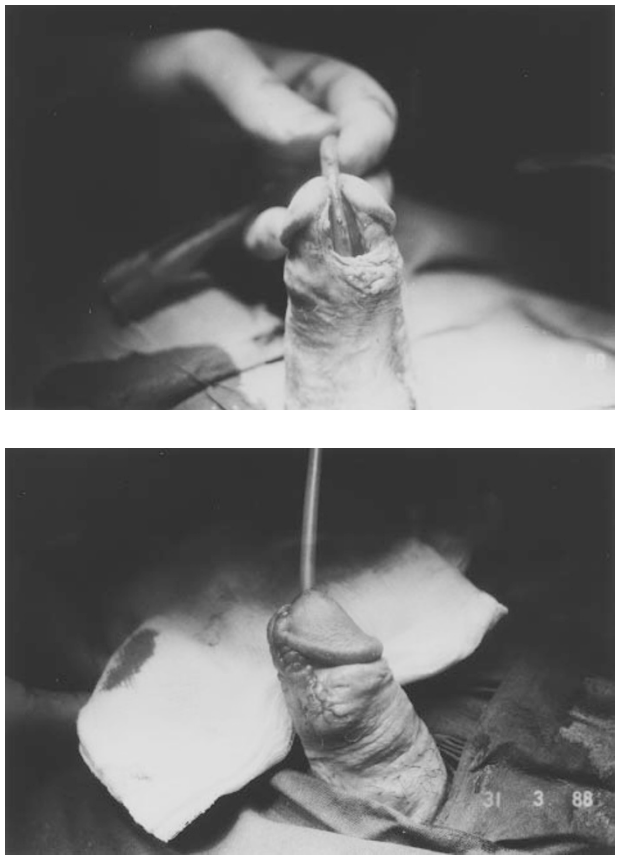

Figure 3 (**a**, **b**) Repair of Iatrogenic hypospadias. (a) before; (b) after reconstruction

particularly if urethral catheterisation is to be continued. However, the younger patient usually demands a normal looking penis. In addition to the unsightly appearance of the cleaved penis, some patients wish to continue with an active sexual relationship. Iatrogenic hypospadias impairs the aesthetic appearance of the penis and thus inhibits sexual function for both partners. In severe cases, this condition reduces management options for primary voiding dysfunction.

Once cleavage is reconstructed, alternative therapy for urinary tract dysfunction after urodynamic investigation should be used. It is imperative that these are clearly defined before reconstruction to avoid re-cleavage. Intermittent catheterisation, condom drainage and spontaneous voiding have all been used in our reconstructed patients (Table 2).

One interesting finding is that contrary to popular belief, impaired penile sensation is not a pre-requisite for this condition to occur. Elderly males with indwelling catheters with normal penile sensation may develop penile urethral injury. Prevention of iatrogenic hypospadias depends upon the avoidance of urethral catheterisation except for short-term use. Where long-term catheterisation is contemplated careful attention to catheter care is imperative and a plea for suprapubic catheterisation is made. With this management arrangement, iatrogenic hypospadias becomes both preventable and avoidable.

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