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Editorial

Failed Hypospadias Repair Presenting in Adults

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It is almost impossible to write a satisfactory journal article on failed hypospadias repair even from a centre like this that specialises in treating such patients. Even with enough patients to produce a good cohort study otherwise, hypospadias encompasses such a wide range of abnormalities at first presentation that it is difficult to review treatment at that stage let alone taking account of the problems of repeated surgery.

The most obvious abnormalities in previously untreated hypospadias are the abnormally sited meatus and the hooded dorsal foreskin. Less obvious, when present, are the chordee, the small size of the glans and the glans tilt. Less obvious still (unless looked for) is the deficient glans cleft, which is almost always the case. Even less obvious are the deficiencies of the corpus spongiosum and of the dartos layer. Because distal hypospadias is much the most common form and because of the type of surgery that surgeons used to treat hypospadias 10–30 yr ago, most of the abnormalities other than of the meatus and the foreskin were either unrecognised or ignored. The most common complications of surgery were meatal regression back to the original site, meatal or distal penile urethral stricturing, urethrocutaneous fistulae, and residual chordee. A common associated problem was a bulbar urethral stricture either because of the use of perineal urethrostomy for urinary drainage following hypospadias repair many years ago, or because of repeated instru-

mentation since, or because of an associated congenital bulbar urethral stricture. In my practice we find proximal bulbar strictures in about 20% of revision hypospadias repairs.

Repeated surgery increases the likelihood of recurrent fistulation and stricturing, mainly because the ventral penile shaft skin is less well vascularised in hypospadias, in turn because the ventral dartos is deficient in hypospadias. The latter also makes fistulation more common for a second reason—because it is more difficult to find enough dartos to interpose between urethral closure and skin closure. Repeated surgery further interferes with both the skin and the dartos layer by adding the effects of scarring.

The so-called “hypospadias cripple” has a meatus that is still abnormally sited in the coronal sulcus or more proximally. The foreskin, by now, is long gone. There is still a deficient glans cleft and glans tilt is present if not frank chordee. If chordee was not part of the original hypospadias problem then it will almost certainly have developed as a result of contraction of the urethral reconstruction particularly if a skin tube or skin flap urethroplasty was used to repair a proximal penile hypospadias. Most of the ventral dartos will have disappeared and the ventral penile shaft skin will be thin, scarred, and closely if not densely applied to the urethroplasty. Because of the scarring, any future surgery is difficult but graft surgery is hazardous because of the lack of vascularisation to create a

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suitable bed for the graft. This, then, is the spectrum of surgical challenges in the patients described in this report [1].

It follows then that the five groups of patients described by Babagli et al. mainly reflect the increasing number of abnormalities present and their severity (and to a lesser extent changing practice in the current preference for buccal mucosal grafts rather than skin grafts). The results therefore become a self-fulfilling prophecy—group 1 does better than group 5. This is not to disparage the results. This group of surgeons is an internationally recognised group of experts.

How do we approach treatment? The first step towards satisfactory treatment is adequate assessment. This means, in the first instance, a clinical assessment of the obvious factors such as visible scarring, fistulation, the site of the meatus, and any obvious meatal stenosis. Less obvious but equally important are the size of the glans, the adequacy of the glans cleft, and the potential contribution of ventral skin tethering to any chordee. Less obvious still are the thickness of the ventral dartos and ventral corpus spongiosum. Next is adequate investigation. The chordee must be objectively demonstrated. A proximal bulbar urethral stricture and any other urethral stricturing must be identified by urethrography. It should be obvious at this stage whether the problems are of the distal penis only or involve the entire penile shaft. Distal problems are relatively easy to correct with good results; proximal ones can be extraordinarily difficult to treat and therefore have a less satisfactory outcome.

I agree with the authors that the state of the spongiosus, but also the state of the dartos is critical to the outcome of surgery. With distal problems it is critical in the sense that there is not usually a problem with the corpus spongiosum or the dartos, and there is therefore good vascularity in the surgical field and so the results are normally satisfactory. The only real challenge is to produce a normally sited meatus. As long as the size of the glans is adequate, a terminal urinary meatus can be created by producing a deep glans cleft, putting a graft onto it to create a glanular urethra, and then leaving enough glans spongy tissue to close over the newly created glanular urethra. In other words, by having a normal glans to work with and by producing a deep glans cleft the surgeon can create a good vascular bed for a graft and thereby get a terminal meatus and a satisfactory result in one stage.

If the problem extends more than a centimetre or so proximal to the coronal sulcus and if the corpus spongiosum and dartos are also deficient

then it can be very difficult to get a satisfactory result. This is because of poor vascularity in the surgical field and therefore a high risk of recurrent stricturing and fistulation. The risk is highest in the gap between normal corpus spongiosum and the spongy tissue of the glans where both the vascular bed for urethral repair (particularly using a graft) and adequate dartos cover for the reconstructed urethra (whether reconstructed by a graft or a flap) can be almost completely deficient. The longer the deficiency of the corpus spongiosum, the more difficult it is to get a satisfactory result in one stage—hence the need for a multistage reconstruction to get a satisfactory result. My approach in such patients is to perform a circumcision incision and deglove the penis entirely. Any scarred skin or graft from a previous urethroplasty can then be excised. An artificial erection shows if there is remaining chordee. If there is, then any fibrotic bands, natural or as a result of previous surgery, can be divided or excised so that the tunica albuginea is stripped bare. In the unusual circumstance that there is a preserved and relatively healthy dorsal urethral plate, this can be fully mobilised. If there is still chordee, then a dorsal Nesbitt procedure should be performed. A ventral corporotomy and patch procedure for chordee are incompatible with a graft reconstruction of the urethra because you cannot put one graft on top of another.

Having straightened the penis, the glans is incised deeply to make room for a graft that will become the glanular urethra with a terminal meatus. The glans cleft can then be grafted with a patch of buccal mucosa. If there is a satisfactory dorsal urethral plate proximal to this neo-urethral graft it can be marsupialised to the adjacent skin. If there is not a satisfactory dorsal urethral plate then the safest thing, in my opinion, is to excise the unsatisfactory urethra and put on a correspondingly larger graft of buccal mucosa (usually) or of postauricular skin (uncommonly) to reach back to normal urethra. This is then quilted onto the newly denuded tunica albuginea, which is, therefore, well vascularized. Care should be taken to tuck some of the dartos under the lateral margins of the graft to make it easier to roll the graft into a tube at the second stage. The skin margins are then sewn to the margins of the graft and the normal proximal urethral margins and that completes the first stage.

A satisfactory assessment 3–6 mo after the first-stage procedure, of the state of the graft and the surrounding skin, the suppleness of the tissues, the adequacy of the depth of the glans cleft, and the straightness of the erection means that a satisfactory result from the second stage (closure)

is more or less guaranteed. If, on the other hand, any residual problem remains, it can be corrected before proceeding to the second stage. A minor interval revision is much better than having to completely take down the completed second stage and start again from scratch.

It takes a surgical lifetime to learn how to deal with all of these various problems but even so, it is very difficult to categorise satisfactorily the treatment of such patients. All the surgeon can do, in each individual case, is to take the previous repair to

bits, identify and correct the abnormalities present, and put the urethra and the penis back together again using the wide range of available techniques to achieve a satisfactory result.

Reference

- [1] Barbagli G, De Angelis M, Palminteri E, Lazzeri M. Failed hypospadias repair presenting in adults. *Eur Urol* 2006;49:887-95.