Journal of Pediatric Urology (2017) 13, 102–109

Educational Article

Preputial reconstruction in hypospadias repair

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Keywords
Hypospadias; Prepuce; Preputioplasty; Preputial reconstruction; Complications

Received 27 October 2015
Accepted 20 July 2016
Available online 22 September 2016

Summary

Objective
In principle, the prepuce can be reconstructed during hypospadias repair, but the procedure has not gained wide acceptance and preputial reconstruction (PR) is surrounded by several controversies.

Material and methods
A review is provided of the technique for PR, how PR combines with the other steps of hypospadias repair, the risks of complications related to the urethroplasty and specific to PR, and the results of PR with particular regard to the relevance for the patient and his family.

Results
PR can be important for patients requiring hypospadias repair and their parents. It can be performed in almost all patients with distal hypospadias except perhaps those with the most asymmetrical prepuces or severe ventral skin deficiency. PR does not seem to increase urethroplasty complications, but combination of PR with tubularisation of the urethral plate urethroplasty seems to offer the best chance of success. Specific complications occur in around 8% of patients and include partial or complete dehiscence of the prepuce and secondary phimosis. To prevent the latter, the reconstructed prepuce should be easily retractile at the end of surgery. Technical modifications can help to achieve this goal. Cosmetically, reconstructed prepuces are not fully normal, but the abnormality could be less important for a patient and his parents that the complete absence of the prepuce.

Conclusion
On the basis of the evidence summarised above, an algorithm for PR in patients with distal hypospadias is proposed. PR can be offered to the vast majority of distal hypospadias patients, although some modification of the technique for hypospadias repair can be required. Retractility of the reconstructed prepuce at the end of surgery seems paramount for final success.

Introduction

Anatomy of the hypospadic prepuce

Hypospadias is characterised by an underdevelopment of all ventral anatomical structures of the penis. The prepuce presents with a V-shaped ventral gap with the apex sitting below the hypospadic meatus; dorsally the skin is redundant, the prepuce stands like a hood over the glans, and dog-ears are present in more severe variants (Fig. 1A and B).

The controversy: PR versus circumcision

Although the prepuce can be reconstructed during hypospadias repair (HR), the procedure has not gained wide acceptance and is surrounded by several controversies [1].

Beyond cultural preferences and personal bias in favour of the putative medical benefits of circumcision, opponents of preputial reconstruction (PR) maintain that the procedure carries an unacceptable risk of specific complications that add up to those of HR [1]. Moreover, concerns exist that PR might increase urethroplasty complications [1]. Finally, opponents of PR maintain that the skin of hypospadic prepuces is dysplasic and this, coupled with the abnormal anatomy, makes PR unlikely to achieve the same cosmetic and functional results of an intact prepuce.

On the opposite side, surgeons in favour of PR maintain that a circumcised penis is not the norm in some cultures, a reconstructed prepuce conceals most of the urethral malformation (e.g., in case a simple meatotomy is elected, or if meatal regression occurs after HR), the preputial skin can be of use should secondary surgery be required for urethroplasty

http://dx.doi.org/10.1016/j.jpurol.2016.07.018

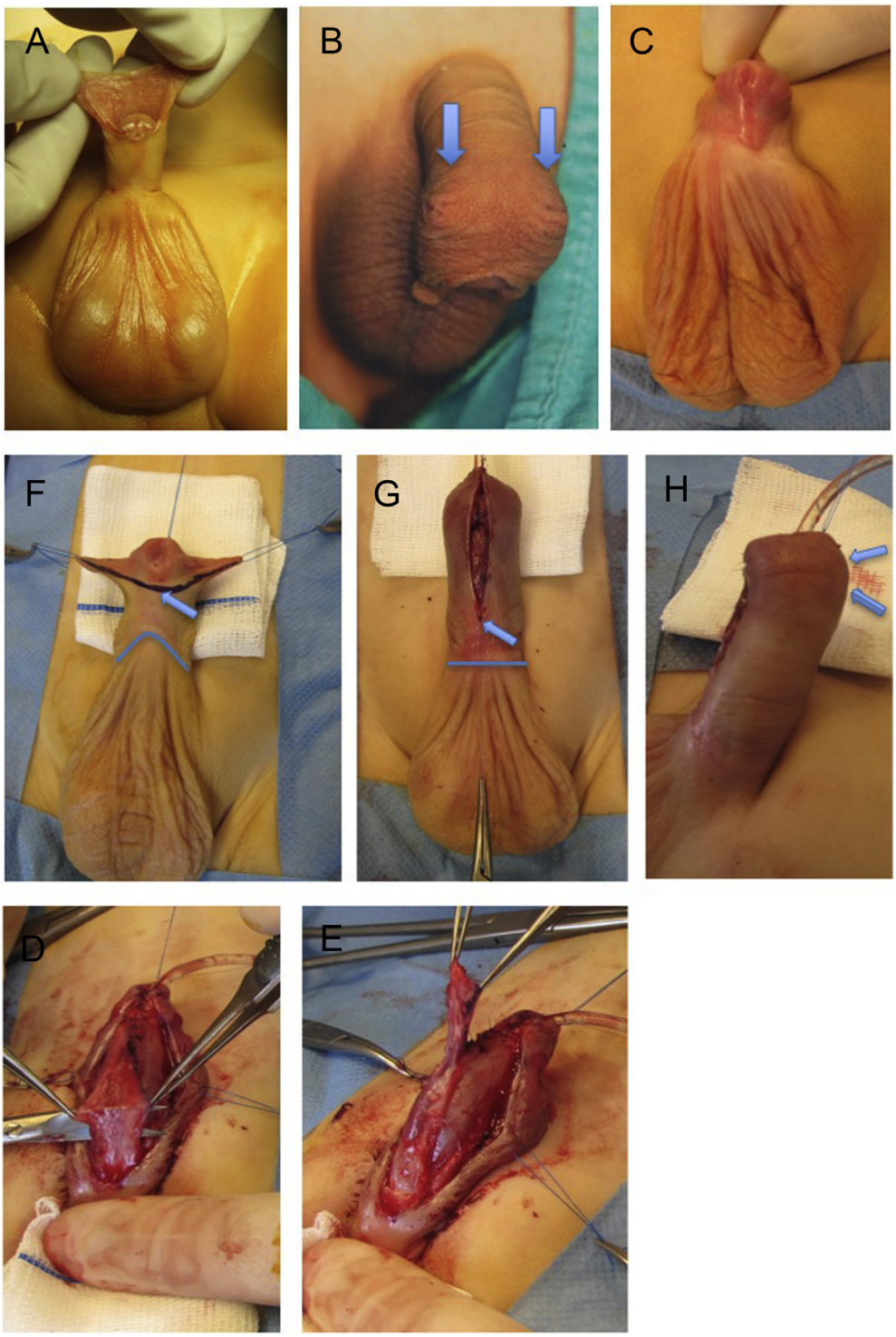

Figure 1 (A—C) Anatomical features of hypospadias relevant to preputial reconstruction. The prepuce presents with a variable ventral gap (A), and sits like a dorsal hood over the glans (B). Dog-ears (arrows) are present in more asymmetrical cases. (C) A patient with ventral skin deficiency; under these circumstances preputial reconstruction is not advisable as preputial skin is often necessary for penile coverage. (D—F) The effects of preputial reconstruction on ventral skin redistribution. After ventral incision and skin mobilization (D), the skin moves caudally (arrows) (E), and the peno-scrotal junction flattens; however, some degree of preputial asymmetry with a dorsal skin excess almost always persists (F). (G,H) Urethroplasty coverage with the ventral based dartos flap flipped over the neo-urethra can be a viable option in patients elected for preputial reconstruction, if a barrier layer to cover the urethroplasty is deemed appropriate.