



## Letter to the Editor

### The anatomy of the child's glans may be obscured by the foreskin, but not that of the surgeon

I read with interest the article recently published in the Journal of Pediatric Urology entitled "The adolescent glans penis: Functional and aesthetic issues following childhood hypospadias repair" [1]. The authors reviewed the surgical correction and late results of the cosmetic appearance of the glans penis and meatus, the direction and shape of the urinary stream and the fistula, if any.

I would like to mention the normal anatomy of the glans penis, the meatus, and the normal shape of the urine stream during micturition. In the normal penile anatomy, the glans wings are separated ventrally by the septum glandis and the frenulum [2,3]. In childhood, the foreskin covers the glans penis and hides the septum and frenulum, making their presence inconspicuous. The foreskin assumes a retracted position with increasing age and clinical observation of the frenulum and detached glans occurs in adulthood. As I say in most hypospadias meetings, "if you look at your penis ventrally and carefully, you can see the details". In addition to the reconstruction of a uniform urethra, I consider it the greatest delusion in pediatric surgery to neglect these structures and to dissect the glans wings and approximate them in the midline in order to enclose the urethra. In adulthood, not only do the surgical results originally achieved in childhood change, but also the appearance of normal anatomy.

Using magnetic resonance imaging (MRI), we showed the detailed anatomical features of the glans penis, the glanular urethra (fossa navicularis) and studied the flow dynamics of urine as a biological fluid. We explained the characteristic wave-like shape of the normal urine stream emerging from the urethra. In addition to the size and geometry of the meatus, the navicular configuration of the glanular urethra and the surrounding septum glandis are important for the flow dynamics of the urine stream. Not only does the

configuration change, but also the compliance, pressure and velocity of urine in the glanular urethra during micturition. Therefore, the mechanical behavior of the male urethra such as deformation should be taken into account during the reconstruction. We have defined navicular fossa and septum glandis as the "flow control chamber" for controlling the flow of urine exiting from the urethra [3–5]. As an anatomical reality, it is important to know that there is no corpus spongiosum around the navicular fossa, but only the septum glandis.

To give the glanular urethra more space and flexibility (like a fossa), we reconstruct a septum and frenulum from the submucosal layer of the inner foreskin as a loose ventral support between the glans wings, as in normal anatomy. In almost all of our patients, we get a wave-like shape of the urine and no meatal stenosis [6]. I can say that almost all complications (stenosis, fistula, dehiscence, diverticulum, etc.) in hypospadias surgery are related to a non-anatomical reconstruction of the glanular urethra. **Without understanding the normal anatomy of the glans penis and the flow dynamics of the glanular urethra, the normal urine stream and the appearance of a penis can never be achieved** by the external contouring of the meatus and glans formation, no matter with or without hyperbaric oxygen therapy (HBOT).

### Conflicts of interest

None.

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DOI of original article: <https://doi.org/10.1016/j.jpuro.2021.07.030>.

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6 November 2021  
Available online xxx