

ORIGINAL PAPERS

Hypospadias – the Surgical Treatment Performed in “Grigore Alexandrescu” Emergency Clinical Hospital for Children

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Abstract

Hypospadias represents one of the most frequent congenital anomalies, in 1 out of 300 male newborns, involving significant biological and socioeconomical implications. The article aims to evaluate the patients admitted and treated for hypospadias. In addition, it offers an overview of the surgery for hypospadias. The cohort included 283 patients admitted and treated for hypospadias or one if its postoperative complications, from the first of January 2013, until december 31st of 2012. The selection was made from the digital database of the hospital based on the diagnosis at the moment of discharge. The surgical techniques used to correct the malformations were analyzed, particularly, the methods for urethroplasty. Taking into consideration the total cohort, a variety of surgical techniques were used. The most frequent type of urethroplasty was the Snodgrass technique, which was used in 47.7% of the patients. The second one was the Mathieu operation which was applied in 18.7% of the patients. Both of them cover 67.8% of the patients, including those cases who were treated using a combination of the two. Analyzing the data which was presented, the surgical procedures which were applied in this cohort were similar to the ones recommended by international guidelines, and the incidence of postoperative complications, depending on every type of hypospadias, was close to the one obtained by recent studies.

Keywords: hypospadias, urethroplasty, postoperative complications.

Rezumat

Hipospadiasul reprezintă una dintre cele mai frecvente anomalii congenitale, diagnosticându-se la 1 din 300 nou-născuți de sex masculin și determină implicații biologice și socio-economice importante. Articolul are ca scop evaluarea pacienților internați și operați pentru hipospadias. În plus, oferă o privire de ansamblu a chirurgiei hipospadiasului. Cohorta a inclus 283 de pacienți internați și tratați pentru hipospadias sau una dintre complicațiile sale postoperatorii. Selecția s-a făcut pe baza diagnosticului de externare. Tehnicile chirurgicale utilizate pentru corecția malformațiilor au fost analizate, insistându-se asupra metodelor de uretroplastie. Procedura Snodgrass a fost cel mai frecvent utilizată, la 47,7% dintre pacienți. Următoarea cea mai utilizată a fost tehnica Mathieu, la 18,7% dintre cazuri. Ambele acoperă 67,8% din totalul cohorței, incluzând și acei pacienți la care s-a utilizat o combinație a acestor două tehnici. Analizând informația prezentată, procedurile chirurgicale aplicate în acest eșantion sunt similare celor recomandate de ghidurile internaționale, iar incidența complicațiilor postoperatorii, în funcție de tipul de hipospadias, a fost, de asemenea comparabilă cu cea obținută de studii recente.

Cuvinte-cheie: hipospadias, uretroplastie, complicații postoperatorii.

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INTRODUCTION

Hypospadias represents one of the most frequent congenital anomalies, in 1 out of 300 male newborns, involving significant biological and socioeconomical implications. Furthermore, recent studies show an increase in its incidence, even after adjusting it according to race, geographic region or socioeconomical status³. The same pattern was recorded by the EUROCAT study group, which was monitoring the statistical and epidemiological data regarding the congenital anomalies in Europe. One prospective study, which evaluated the incidence of the hypospadias in Holland (0.7%), demonstrated that it is more frequent than congenital heart anomalies (0.5%), which are considered to be the most frequent ones by the EUROCAT study group⁵. The article aims to evaluate the patients admitted and treated for hypospadias in the Clinical Emergency Hospital for Children „Grigore Alexandrescu, the First Pediatric Surgery Ward, along a period of two years, since the hospital addresses the regional as well as the national pathology. Another purpose of this paper is to offer an overview of the surgery for hypospadias.

MATERIALS AND METHODS

The cohort included 283 patients admitted and treated for hypospadias or one if its postoperative complications, from the first of January 2013, until december 31st of 2012. This period was chosen in order to collect sufficient data regarding the long-term postoperative evolution. The patients were selected from the digital database of the hospital based on the diagnosis at the moment of discharge, according to the International Classification of Diseases. Ultimately, the data was collected from the medical records and the registry books of operations. The limitations of the study were represented by retrospective manner of collecting the data and by the fact that the cohort cannot be considered a representative one since it was not reported to the total number of cases from the pediatric population. Regarding the postoperative complications, the surgical corrections of the recurrences performed in this hospital were the only ones included, so admissions to other centers of pediatric surgery cannot be precluded. The surgical techniques used to correct the malformations were analyzed, particularly, the methods for urethroplasty. Descriptive statistics were used in order to compare the methodology applied in the Clinical Emergency Hospital for Children „Grigore Alexandrescu”, Bucharest, compared to international guidelines.

RESULTS AND DISCUSSIONS

At the time of admission, the patients were in two possible situations concerning the surgical history of this condition. The group of patients who did not undergo surgical treatment for hypospadias was called the „naive” group, while the rest of the patients were included in the group of „previous surgical corrections”. The surgical treatment of each of the three components of the penile anatomy involved in this congenital anomaly was included: the type of urethroplasty, dorsal penile deflection and glanuloplasty. The types of urethroplasty in both groups are presented in Table 1.

Taking into consideration the total cohort, a variety of surgical techniques were used. The most frequent type of urethroplasty was the Snodgrass technique, which was used in 47,7% of the patients. The second one was the Mathieu operation which was applied in 18,7% of the patients. Both of them cover 67.8% of the patients, including those cases who were treated using a combination of the two. One small group of patients, meaning 24 cases, did not require any type of urethroplasty, 10 of them belonging to the „naive” group, while the rest of them underwent at least one type of surgical treatment in the past. Congenital penile curvature (chordee without hypospadias) was diagnosed in 7 patients from the „naive” group, while the other 3 required glanuloplasties. The patients from the other group who did not undergo any type of urethroplasty required additional correction of the penile curvature (23.8%) or glanuloplasty (76.2%). The international

Table 1. Types of urethroplasties or other surgical corrections involving the urethra

Type of Surgical Treatment	Number of patients	Percentage
Urethral Dilations	11	3.9
Duplay	3	1.1
Excision of the Urethral Diverticulum	1	0.4
No Urethroplasty	24	8.5
Glanuloplasty	3	1.1
Closure of urethrocutaneous fistulas	17	6.0
Leveuf Godard	3	1.1
MAGPI	10	3.5
Mathieu	53	18.7
Mathieu+Snodgrass	4	1.4
Meatoplasty	14	4.9
Urethrotomy	1	.4
Snodgrass	135	47.7
Byars' Flaps	4	1.4
Total	283	100.0

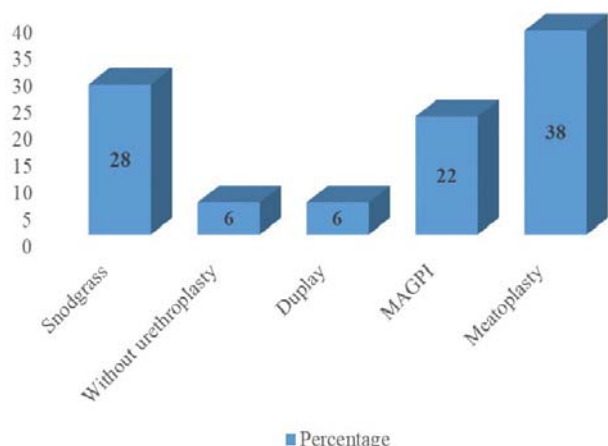


Figure 1. Types of Urethroplasty Used in Glanular Hypospadias.

treatment guidelines present different recommendations depending on the type of hypospadias and the shape of the glans. The surgical techniques recommended for the correction of the glanular hypospadias are MAGPI (Meatoplasty and Glanuloplasty), GAP (Glans Approximation Procedure), TIP (Tubularised Incised Plate) and Mathieu^{6,7,8}. In this cohort, the most frequently used surgical technique for this type of hypospadias was meatoplasty, in 38% of the cases (Figure 1). The preference for this option could be explained by the high location of the urethral orifice, very close to the tip of the glans, which allowed a satisfactory correction by this method alone. The following ones were the Snodgrass technique (27%) and MAGPI (22%).

For the treatment of distal hypospadias, the European Association of Urology recommends using the urethral plate as a reference point in the surgical treat-

ment. The recommended techniques in the first step of treatment are Tiersch – Duplay, when the urethral plate is large enough to allow the tubularization, or the Snodgrass technique, when it is short. The Mathieu technique is mentioned as another possibility, although other guidelines mention it as a preferable option, next to Snodgrass and Onlay urethroplasties^{6,7,8}. With regards to this cohort, distal hypospadias was treated by the Snodgrass and Mathieu procedures in 50% of the cases, and 21,5% respectively (Figure 2). The Onlay procedure was never used, and the Duplay urethroplasty was applied in 2 patients (1.63%). The Leveuf – Godard procedure was used more often compared to other centers, which could be explained by the expertise of the surgeons in this particular method.

Most of the articles which analyze the efficiency of urethroplasties present the results obtained mostly after the Snodgrass, Mathieu or Onlay procedures, which proves the variable use of these procedures. The recommendations for the correction of the proximal hypospadias are also based on keeping the urethral plate and using it as often as possible in reconstructing the future urethra⁹. The preferred techniques are Snodgrass and Onlay. When the penile curvature cannot be corrected by preserving the urethral plate, the Koyanagi procedure is recommended or the two-steps urethroplasty. Analyzing the distribution of the surgical techniques in the category of proximal hypospadias which did not require the incision of the urethral plate and with no previous surgical corrections, most of the cases benefited from the Mathieu (16.3%) and Snodgrass procedures (53%) (Figure 3). Regarding the proximal hypospadias, the Onlay procedure was not used. The

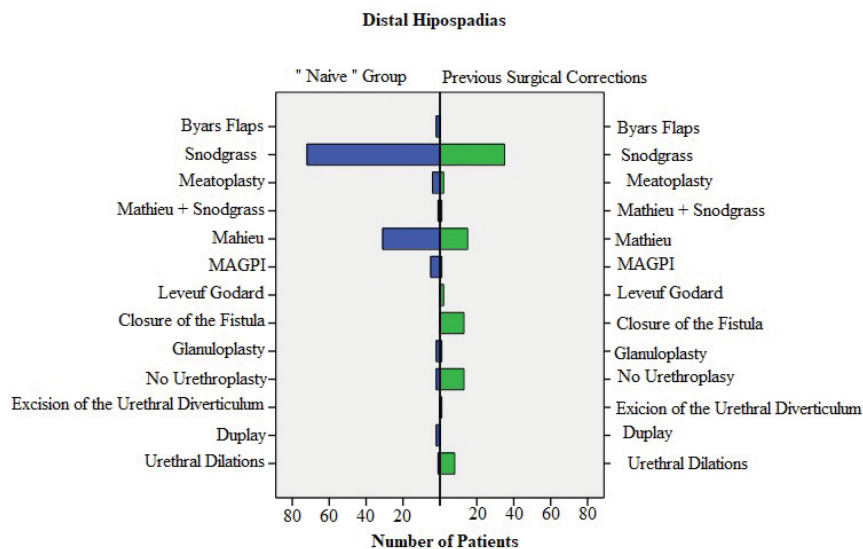


Figure 2. Surgical Techniques Used in Distal Hypospadias According to the Patient's Medical History.

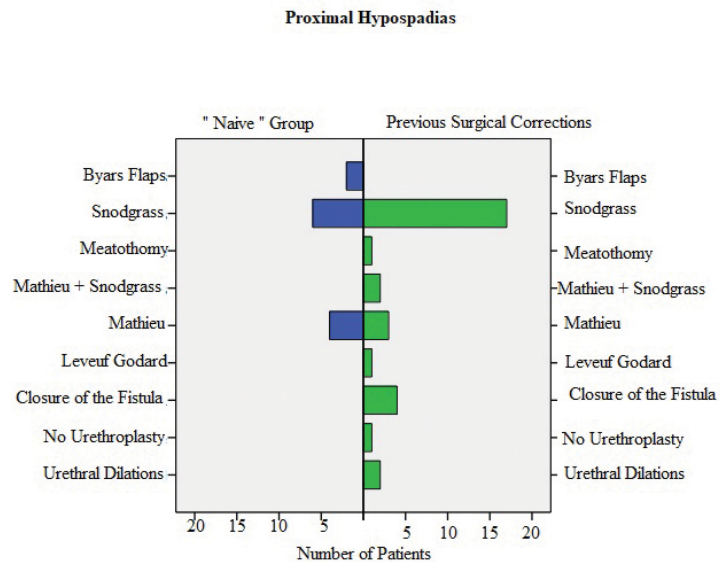


Figure 3. Surgical Techniques Used in Proximal Hypospadias According to the Patients' History.

group with previous surgical corrections was treated mostly by the Snodgrass technique¹¹.

When the penial curvature was severe, it required the incision of the urethral plate, so the two-steps procedure was applied, with Byars flaps used in order to substitute the urethral plate. Proximal flap of the urinary meatus was used in 2 cases of proximal hypospadias and 2 of distal hypospadias. These 4 cases sum up 1.41% incidence of severe penile curvature, which is small compared to the one cited in recent studies¹⁰. Despite the fact that the attention was focused primarily on the types of urethroplasty, the correction of the other anatomical components involved were not excluded. Consequently, the correction of the penile curvature was obtained by releasing the skin from the fibrous adhesions created along the penile body and it was mandatory in 29.68% of the cases from the entire cohort. Taking into consideration the fact that only 4 cases required the incision of the urethral plate, and that midline dorsal plication was necessary in only one patient, the incidence of severe penile curvature represents 1.76% of the cases. Similar incidence rates were found in other studies which focused their research on this aspect¹¹. The glanuloplasty consisted of the ventral transposition of the skin and the longitudinal suture of the glans, circumcision, Byars flaps, or other methods which were adapted to the particularities of the patients, especially those with previous surgical corrections. The overall rate of circumcisions was small (1.27%), taking into consideration the fact that most of the surgeons prefer this method in most of the cases¹².

Concerning postoperative complications, patients undergoing treatment for glandular hypospadias did

not require additional surgical corrections, the efficiency in curing this condition being remarkable, since the medical literature reports small rates of recurrences^{13,14}. Urethral complications occurred in 16.82% of the cases who were treated for distal hypospadias, while recent studies report rates varying from 6.2-7% up to 21.8%¹⁸. These complications consisted of urethral fistulas, urethral stenosis or unsatisfying cosmetic result which required additional corrections. The highest rate of complications occurred in the treatment of proximal hypospadias (44.18%), the value being situated in the interval obtained by a metaanalysis which compared the onlay and Snodgrass procedures in proximal hypospadias, the rate of complications varying between 13.54%²⁰ and 60%²¹.

CONCLUSIONS

Analyzing the data which was presented, the surgical procedures which were applied in this cohort were similar to the ones recommended by international guidelines, except for certain particularities: for the correction of glandular hypospadias, there was a higher rate of other procedures, whereas in case of distal hypospadias, the regeneral recommendation of preserving and including the urethral plate during the process of urethroplasty was widely used. One distinguishable aspect is the usage of the Leveuf – Godard technique, compared to the international guidelines. Regarding the correction of the proximal hypospadias, there was a tendency in preserving the urethral plate, the Snodgrass procedure being mostly used, followed by the Mathieu technique. When the incision of the urethral plate was necessary,

the two-steps urethroplasty using the Byars flaps was the preferred method. As a particularity, there was a limited use of skin or oral mucosa grafts for the correction of proximal or distal hypospadias. As far as post-

operative complications are concerned, the incidence according to every type of hypospadias corresponds to the one cited by recent research, which emphasizes the benefit of the treatment.

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