Hypospadias – Are We as Good as We Think?

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Introduction and Objectives. No cause has yet been discovered for hypospadias, although multiple hypotheses have been considered, such as: family history, maternal age of over 35 years, exposure to certain drugs and chemicals during pregnancy and genetic anomalies. Many surgical techniques have been postulated as a treatment for this condition, aiming to have a small percentage of complications, but there is still no consensus upon the best type of procedure. The aim of this study is to underline the importance and necessity of a centre of excellence in the diagnosis and management of hypospadias, by comparing from multiple points of view the patients admitted initially in our centre and the patients who have been operated in other hospitals, referred to our department for the treatment of complications.

Materials and Methods. The study includes 848 patients, divided into two groups: group A - 677 patients admitted and managed exclusively in our centre and group B - 171 patients referred for the treatment of complications. The statistical analysis has been made using GraphPad Prism 7.

Results. The children belonging to group A were operated on at a much younger age (32.65 months, n=677 vs 83.05 months, n=171, p<0.0001). In addition, the patients in group B had undertaken the surgery at a much higher grade of hypospadias, generally 2, compared to the patients in group A, where we chose to operate starting with grade 1 (p<0.0001). It is worth mentioning that the patients who had been previously operated on had undertaken between 1 and 20 procedures, with a mean of 2 to 3 operations. The patients admitted and managed solely in our hospital underwent between 1 to 6 procedures, with 79.46% having just one surgery. After the first intervention in our ward, group A had a much lower rate of postoperative complications, compared to the other group (19.44% vs 27.2%). The frequency of distribution of the complications in the two groups was significantly higher in the group of patients having re-interventions (p=0.0003, RR=0.59). One can interpret this value as being highly protective, shielding future patients from complications, if it is decided they should receive surgical treatment in a centre with experience in the management of hypospadias. In both cases, the most frequent complications were fistulae and stenoses, but their frequency of distribution seems to be equally divided (p>0.05).

Conclusion. The simple gesture of deciding to seek treatment in a centre with great experience in the management of a condition so heterogeneous, both clinical and outcome-wise, as hypospadias, is a way of preventing a significant percentage of both major and minor complications.

Key-words: Complication, Hypospadias, Outcome, Surgery.

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Introduction and Objectives

With an incidence of 1 in every 200-300 live male births, hypospadias is the second most common genital defect after cryptorchidism [1,2]. No cause had been discovered in order to explain the pathophysiology of hypospadias, but factors such as family history, maternal age over 35 years, exposure to certain chemicals or drugs during pregnancy and genetic anomalies should be considered [3, 4]. In most cases, the diagnosis of hypospadias is established after birth during the physical examination [5, 6]. Since ancient times many surgical techniques have been described in the treatment of this condition, but no consensus has been reached regarding the best one [6]. The aim of the surgery is to obtain a straight penis with a slit-like meatus situated at the apex of the glans, a conical looking glans and an acceptable cosmetic outcome. As for all reconstructive procedures, the best chance of a good outcome is with the first surgery [7]. That being said, the surgical treatment of hypospadias should not be considered a minor procedure [7].

When reviewing the literature, one finds that hypospadias is repaired by paediatric surgeons, paediatric urologists, adult reconstructive urologists and plastic surgeons, thus diluting the experience in treating this condition [2, 6]. Yet, there is no established speciality that caters to this malformation [6]. Duckett and others managing this anomaly have started calling themselves hypospadiologists, but this term has yet to be accepted by the entire medical community.

This study seeks to underline the importance and the necessity of a centre of excellence in the management of hypospadias cases by comparing the patients admitted and operated in our clinic for the first time with patients who were referred for the management of complicated hypospadias, after previous surgeries in other hospitals.

Materials and Methods

The data was obtained from our hospital’s database for all admissions between January 2009 and January 2019 with a diagnosis related to hypospadias. Inclusion criteria were all patients admitted to our hospital for corrective surgery for hypospadias. Exclusion criteria were all patients with a procedure performed outside the study period, and those patients with disorders of sexual differentiation, adrenogenital disorders, epispidias or urinary bladder malformations. For this cohort, subsequent admissions following hypospadias surgery were also reviewed in order to establish a possible connection to postoperative complications. Approval for the use of this data was obtained from the ethical committee. The statistical analysis was performed using GraphPad Prism 7.

Results

During the study period, 848 patients with hypospadias were admitted for surgery in our centre. We divided these patients into two groups: group A – 677 patients who have been admitted and managed exclusively in our centre and group B – 171 patients who were referred to our clinic for the treatment of postoperative complications.

The patients in group A were operated on at a much younger age than the patients in group B (32.65 months, n=677 vs 83.05 months, n=171). This difference was statistically significant (p<0.0001).

Graph 1. Median age difference between patients in Group A and B

Graph 2. Correlation between ages of patients in group A and group B
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<table>
<thead>
<tr>
<th>Sample size</th>
<th>677</th>
<th>171</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic mean</td>
<td>32.6588</td>
<td>83.0351</td>
</tr>
<tr>
<td>95% CI for the mean</td>
<td>29.6919 to 35.6257</td>
<td>74.6024 to 91.4678</td>
</tr>
<tr>
<td>Variance</td>
<td>1545.7429</td>
<td>3120.5282</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>39.3159</td>
<td>55.8617</td>
</tr>
</tbody>
</table>

In addition, the patients in group B had undertaken the surgery at a much higher grade of hypospadias, generally II, compared to group A, where we chose to operate starting with grade I. This difference was also statistically significant (p<0.0001). (Graph 3 and 4)

The most frequent complications for which the patients in group B were referred to our centre were ectopic meatus, fistulae and stenosis. The incidence of other complications such as persistent chordee, urethral diverticulum and breakdown of urethroplasty was lower. (Graph 5)

After the first intervention in our clinic, group A had a much lower rate of postoperative complications, compared to the other group (19.44% vs 27.2%). (Graph 6)

The frequency of distribution of the complications in the two groups was significantly higher in the group of patients having re-interventions (p=0.0003, RR=0.59). One can interpret this value as being highly protective, shielding future patients from complications, if it is decided they should receive surgical treatment in a centre with experience in the management of hypospadias. In both cases, the most frequent complications were fis-
tulae and stenoses, but their frequency of distribution seems to be equally divided (p>0.05).

Discussions

While the aim of hypospadias repair of obtaining a functional and cosmetically normal penis seems an easy task, surgery for this malformation is still one of the most challenging problems in paediatric urology [8]. The complications of hypospadias surgery include fistula formation, urethral stricture, an ectopic meatus, residual curvature and cosmetic abnormalities, each of these complications having different incidence [3, 9]. In more than 70% of patients, cosmetic results are satisfactory [4]. However, identifying high complication rates in specialized paediatric urology services is crucial and warrants further investigation and risk identification in order to establish if modifying surgical techniques in order to achieve a satisfactory outcome is necessary [10].

We recommend surgery for these patients between the ages of 6-18 months. However, age at the time of surgery was relatively high in both our groups, mostly due to the late presentation following failure of referral. [9, 11, 12]

In our series, the average number of procedures performed for the repair of hypospadias is comparable to other published studies [11].

Studies have shown a clear relationship between the caseload volume and the complication rates following hypospadias surgery, suggesting that high volume centres have a significantly lower complication rate than low volume centres as we have also been able to demonstrate in this present series. High volume centres also deal with more complex/complicated cases [13].

No consensus regarding the optimal surgical technique has been reached. In our centre, the choice of a certain surgical technique is made after intraoperative assessment and taking into consideration the type of hypospadias and the surgeon’s preference.

Conclusions

The simple gesture of deciding to seek treatment in a centre with great experience in the management of a condition so heterogeneous, both clinical and outcome-wise, as hypospadias, is a way of preventing a significant percentage of both major and minor complications.

References