

# Effect of Preventive Nursing on Male Children with Hypospadias in Preventing Postoperative Complications

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## ABSTRACT

**Objective:** To determine the clinical impact of preventive nursing on children with hypospadias and the intervention effect on postoperative complications.

**Study Design:** Comparative study.

**Place and Duration of the Study:** Department of Urology Surgery, Beijing Children's Hospital Affiliated to Capital Medical University Baoding Hospital, Hebei, China, from August 2019 to July 2021.

**Methodology:** Children with hypospadias who received elective surgery were randomly divided into two groups of forty cases each. The control group received traditional specialised nursing care during the perioperative period, the study group administered preventive care on the control basis. The postoperative rehabilitation, VAS, anxiety and depression score, postoperative complications, and nursing satisfaction were compared between the two groups.

**Results:** The time of first bowel movement, extubation, and hospitalisation in the study group were significantly shorter than in the control group, with statistically significant value ( $p < 0.001$ ). After intervention, the SAS and SDS in the study group were significantly lower than those in the control group, and the difference was statistically significant ( $p < 0.05$ ). The incidence of complications in the study group was 7.50%, lower than the 25% of control group ( $p = 0.034$ ). The postoperative VAS scores of the study group were significantly lower than those of control group at 6 and 24 hours ( $p < 0.05$ ). Besides, nursing satisfaction in the study group was 97.50%, higher than the 82.50% of the control group ( $p = 0.025$ ).

**Conclusion:** Preventive nursing had a reliable nursing effect on children undergoing hypospadias surgery, which can reduce postoperative complications, alleviate postoperative pain, improve postoperative anxiety and depression, enhance nursing experience, and promote postoperative recovery.

**Key Words:** Preventive care, Hypospadias in male children, Urethroplasty, Complication, Clinical effect.

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## INTRODUCTION

Hypospadias is a common congenital malformation with a prevalence of about 0.3~0.8%, in male children.<sup>1</sup> The main clinical manifestations of hypospadias include penile curvature, absence of frenulum, and abnormal external urethral orifice,<sup>2</sup> which can produce negative influence on the standing urination function of male children. It also affects the sexual function of the male children in adulthood, significantly influencing the psychological and physical health of this population. It is therefore recommended to apply correctional treatment at an early stage in the clinical practice.<sup>3</sup>

Urethroplasty is the main clinical treatment for hypospadias, which, however, requires a highly precise operation and has great difficulty in practice.

Moreover, male children have relatively poor tolerance to surgery, and thus higher risks of postoperative complications such as urinary fistula,<sup>4</sup> and urethral stricture, seriously affecting the surgical effect and the psychological health of affected children. Therefore, perioperative nursing intervention in male children with hypospadias is of great significance to reduce postoperative complications and improve clinical prognosis.<sup>5</sup> Due to poor self-control and compliance in children, postoperative pain, fear, and other factors often prevent them from cooperating with nursing care. It is therefore difficult to carry out clinical nursing smoothly, leading to a relatively high incidence of postoperative complications. Preventive theory based nursing intervention (i.e. preventive nursing) can predict possible problems and implement corresponding nursing programmes by considering the development characteristics of the disease in children and specific clinical practice. It has been confirmed that positive intervention can reduce postoperative complications' incidence for the nursing of children undergoing surgery.<sup>6</sup> According to the report by Graif *et al.*, preventive nursing adopted intervention measures under the concept of primary prevention, which could achieve the role of auxiliary treatment on the basis of the gradually strengthened nursing through the establishment of the environment and support

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system, health education, complication prevention, rehabilitation nursing, etc. It can reduce related risk factors, decrease the risk of surgery, and lower the occurrence of other non-infectious complications.<sup>7</sup> Accordingly, the present study was carried out to determine the effect of preventive nursing for male children with hypospadias, for control of complications after surgery for hypospadias.

## METHODOLOGY

The study was a comparative and clinical study of 80 male children with penile hypospadias who were admitted at Beijing Children's Hospital Affiliated to Capital Medical University Baoding Hospital from August 2019 to July 2021.

Enrolled subjects were randomly divided into the study group ( $n = 40$ ) and the control group ( $n = 40$ ). Since no substantial distinctions were noticed in comparing the general information between the two groups, comparability was found between the study group and control group ( $p > 0.05$ ). The study was approved by the Institutional Ethics Committee of Baoding Children's Hospital (No. 2018-07, dated May 23, 2018). Written informed consents were obtained from all participants.

The inclusion criteria was male children aged between 4~12 years who met the diagnostic standard for penile hypospadias,<sup>8</sup> needed surgical correction, had no disease of the lungs, heart, and other vital organs, had no cognitive and mental disorders, and who could understand as well as actively cooperate with the treatment and nursing plan. The children whose guardian agreed to participate in the research, submitted a written informed consent form, with complete clinical data, showed cooperation in completing research and compliance to the treatment were recruited into the study. Male children who had other important organ dysfunction, could not tolerate surgery, had severe mental disorder or cognitive impairment, with poor treatment compliance and were unable to cooperate with surgical treatment or nursing, with unsatisfactory control of local infection and without the ability to collaborate to finish the research were excluded.

Children were divided into the study and control group, and both groups underwent microscopic TIP urethroplasty. The control group used traditional specialised nursing during the perioperative period, including strengthening inspection and communication preoperative, carrying out propaganda and education, and deepening the male child's family member's understanding of the disease. Postoperative strategies included strengthened surgical incision care, following the doctor's advice for local anti-infection treatment, urethral stent nursing, regular change of dressing, and mood soothing. Meanwhile, non-closed lipid hydrogel was used to dress the inner incision and the outer incision with compression to ensure smooth urine drainage. In addition, symptomatic treatment such as analgesics would be applied for children with severe pain.

In the study group, the intervention strategy was preventive nursing during the perioperative period. The specific measures

were defecation exercise before operation whereby male children were guided to defecate on bed through active communication. Individualised diet plans based on the tastes of children were developed by working with the families. Drinking a small amount of warm water was permitted 2-4 hours (h) after surgery under the premise of stable vital signs; children were given a high-vitamin and nutritious liquid diet in the presence of no cough or vomiting. Other diet care included: fresh fruit and semi-liquid diet 3 days postoperative; soft food 7 days postoperative; and gradual transitioning to general food. Meanwhile, it was strictly forbidden to take carbonated drinks, strong tea, coffee, spicy, and hard food. For children with mild pain, attention diversion would be used by playing interesting cartoons, providing toys etc., combined with psychological comfort to relieve their pain.

During nursing, struggling and crying were managed as much as possible to reduce the negative pressure and tension of the incision. Electromagnetic therapeutic apparatus was adopted to irradiate the incision 24h after operation, with attention paid to protecting the scrotum. Additional measures included regular rinsing of the urethra, disinfection of the incision and perineum with iodophor, with the local application of fusidic acid cream after drying until the removal of urinary catheter. Autonomous urination was restored after the removal of the urinary catheter. The children's control and mastery of urination were strengthened through video animation, oral guidance, etc. Further treatment was given in case of symptoms of suspected urethral stricture, such as urgent micturition, pain in urination, dysuria, or poor urinary flow. Furthermore, children were instructed to defecate in bed. For those with difficulty in defecation, laxative was used according to the doctor's advice to prevent the incision from cracking due to the excessive force. The skin around the incision was cleaned postoperatively, with external application of body oil to improve the local symptom of itching, and to avoid scratching the perineum that could increase the risk of incision infection, bleeding, and shedding of the urinary catheter. Family members were guided to explain the disease to the children gradually during their growth, so that these children can understand the causes of some symptoms and abnormal physiological structures to eliminate the shame psychology and understand the disease with a correct attitude. Health education was provided to the parents of the affected child, with the explanation of methods, steps and the effect of surgery, postoperative rehabilitation, protection measures of the drain, etc., with careful response to the relevant questions raised by the family members. In addition, the family members were encouraged to soothe the child's bad mood through psychological pacification, coordination of medical behaviour and ensure the quality of rehabilitation.

The length of hospitalisation, the time of first bowel movement, and the time of catheter removal were compared between the control group and study group. Self-rated Depression Scale (SDS) and Self-rated Anxiety Scale (SAS) were utilised to assess the mood changes before and after the intervention.<sup>9</sup> Children with lower scores were taken as having better emotional status.

**Table I: Comparative analysis of perioperative indicators, postoperative complications, and nursing satisfaction between the two groups of pediatric patients ( $\bar{X} \pm S$ )n=40.**

Indexes	Study group	Control group	t/c <sup>2</sup>	p
Time of catheter removal (d)	7.65±1.83	10.08±2.37	5.121	0.000
Time of first defecation (h)	28.78±8.07	36.90±8.13	4.486	0.000
Length of stay in the hospital	9.78±1.23	12.45±2.06	7.046	0.000
Postoperative complications			4.501	0.034
Incision infection	1	3		
Urinary fistula	1	2		
Urethral stricture	0	4		
Poor wound healing	1	1		
Nursing gratification			5.000	0.025
Very satisfied	30	23		
Relatively satisfied	7	6		
Satisfied	2	4		
Uncertain	1	5		
Dissatisfied	0	2		

**Table II: Contrast of emotional status and postoperative pain symptoms between the two groups of pediatric patients ( $\bar{X} \pm S$ ) n=40.**

Indexes	Study group	Control group	t	p
SAS				
Prior to intervention	57.45±6.01	58.10±6.21	0.476	0.636
After intervention*	42.63±6.75	47.35±6.33	3.228	0.002
SDS				
Prior to intervention	46.65±2.21	46.08±2.37	1.122	0.265
After intervention*	37.68±1.83	43.10±1.95	12.842	0.000
VAS				
1h after surgery	5.25±1.10	5.45±1.06	0.826	0.411
6h after surgery*	3.38±0.77	3.78±0.73	2.3725	0.020
12h after surgery*	2.03±0.67	2.55±0.50	4.000	0.000

\*p &lt; 0.05

Postoperative complications of the two groups were compared, including infection, urinary fistula, urethral stricture, poor wound healing, etc. Visual Analogue Scale (VAS) was employed to evaluate the degree of pain 1h, 6h, and 24h after surgery, with a total score of 0-10 points. Children with higher score indicated more severe pain.<sup>10</sup> A short-form version of the 18-item Patient Satisfaction Questionnaire (PSQ-18)<sup>11</sup> was used to compare and analyse the satisfaction degree of male children before and after the intervention, including quite satisfied, relatively satisfied, satisfied, uncertain, unsatisfied. The total degree of satisfaction = (very satisfied + relatively satisfied + satisfied)/total case number x 100% was calculated.

SPSS 20.0 application was applied to statistically analyse all data. Data of measurement was represented by ( $\bar{x} \pm s$ ). For between-group data analyses, two autonomous sample t-tests were applied; for within-group analyses, ANOVA or pairwise t-tests were utilised.  $\chi^2$  test was used to compare the rates. When p-value was less than 0.05, a significance was indicated.

## RESULTS

The subjects were randomly divided into the study group (n = 40, 6~12 years, average 7.05 ± 1.66) and the control group (n = 40, 5~12 years, average 7.13 ± 1.92). Since no

substantial distinctions were noticed in comparing the general information between the two groups, comparability was found between the study group and control group (p>0.05). The study group had significantly shorter post-operative catheter removal time, first bowel movement time, and hospitalisation time as compared to the control group. The value was statistically significant (p<0.001, Table I).

Urinary fistula, incision infection, poor wound healing, and urethral stricture were the main postoperative complications in the study and control groups (Table I). The complication rate in the control group was 25%. The complication rate in the study group was 7.50%. The frequency of the former was significantly higher than that of the latter (p = 0.034).

The care gratification rate of the control group was 82.50%. In comparison, the study group had a nursing gratification rate of 97.50%. Care gratification was less in the control group than in the study group (p = 0.025, Table I). The difference was statistically significant. Prior to the intervention, no statistically meaningful distinction was detected between the control group and study group regarding SDS and SAS grades (p>0.05). After the intervention, the control group had considerably more SDS and SAS grades than the study group. The difference was statistically significant (p < 0.05, Table II).

As exhibited in Table II, no considerable contrast in VAS grades was found between the control and study groups at 1h postoperatively. At 6h and 24h postoperatively, the VAS degree of boys in the control group was meaningfully more prominent than that of the study group. The difference was statistically significant (all  $p < 0.05$ ).

## DISCUSSION

In recent years, the incidence rate of hypospadias has increased annually.<sup>12</sup> In general, the occurrence of hypospadias can be explained by intrinsic hereditary factors, extrinsic environmental factors, hormone regulation, gene mutations, etc.<sup>13</sup> Consequently, it may cause incomplete fusion of bilateral urethral folds in the embryonic stage of the urethral sulcus, resulting in the defect of the distal urethra. Connective tissue and fiber strands may replace the suburethral tissue, leading to penis deformity, especially in distal penile hypospadias.<sup>14</sup> Surgery has been recognised to be the major choice for the clinical treatment of congenital hypospadias.<sup>15</sup> However, it requires high accuracy of the operation, since it is difficult to operate and has a relatively higher risk of postoperative complications that seriously affect the surgical outcome and postoperative rehabilitation. According to the previous researches, urinary fistula and urethral stricture account for >20% of the postoperative complications of hypospadias, acting as the important factors affecting the surgical effect and postoperative urogenital function.<sup>16</sup> Moreover, owing to poor self-control and compliance, children are unable to cooperate with nursing due to postoperative pain and fear, which may also explain the high incidence of postoperative complications.<sup>17</sup> The traditional nursing is mostly based on the doctor's advice, without foresight, pertinence and planning, hence, the effectiveness in preventing complications is not ideal. Therefore, it has become a focus of research for clinical nursing concerning the exploration of effective nursing to reduce the incidence of complications after surgery for hypospadias in male children.

In the traditional practice, nursing is generally implemented according to the doctor's advice, without pertinence, planning and prevention of nursing-related problems, leading to a poor preventive effect of postoperative complications. Significantly, preventive nursing, proposed as a new concept of intervention in the field of nursing, is applied clinically based on a comprehensive understanding of the characteristics and outcomes of relevant diseases, and quantitative assessment of the condition of illness according to the vital signs of patients. It emphasised on the application of various preventive nursing measures to predictably intervene in the problems of patients, so as to provide a more comprehensive, systematic and targeted nursing for children, which played an important role in clinical crisis intervention.<sup>18</sup> Furthermore, preventive nursing significantly functioned in mental health recovery, etc., in addition to considerable advantages in postoperative rehabilitation and reducing complications.<sup>19</sup> For example, Laing *et al.* believed that preventive care has a significant positive

effect on preventing infections, poor wound healing, etc.<sup>20</sup> It can accelerate the recovery of children and reduce the incidence of complications while preventing complications.

The concept of preventive nursing has been advocated clinically in the recent years. It has emphasised on individual differences, and personalised nursing measures to be formulated in combination with patient's condition of illness, surgical characteristics and postoperative recovery.<sup>21</sup> Eventually, it may benefit the achievement of predetermined nursing goals, as well as promoting and maintaining the physiological and psychological functions of these patients.<sup>22</sup> In this study, the control group had considerably longer catheter removal time, hospitalisation, and first bowel movement time than the study group ( $p = 0.000$ ). Moreover, later than the intervention, the boys in the study group had fewer SDS and SAS grades than the control group ( $p < 0.05$ ). After comparison, there was also a considerable distinction in complication rates between the study and control groups (7.50% *versus* 25%,  $p = 0.034$ ). Furthermore, at 6h and 24h postoperatively, the VAS grades of the boys in the control group were substantially more than that of the study group ( $p < 0.05$ ). All discoveries indicated that preventive nursing is likely to facilitate the restoration of gastrointestinal function and incision, shortening catheter removal time and hospitalisation after urethroplasty for hypospadias in male children. Similarly, Zhang *et al.* believed that preventive nursing intervention models can provide patients with sustained and high-quality rehabilitation care.<sup>23</sup> Moreover, the implementation of preventive care can facilitate the improvement of patients' quality of life and their bad feelings, reduction of pain threshold, and increase postoperative happiness.<sup>24</sup> In this research, the care gratification rate of the control group was 82.50%. In comparison, the study group had a care gratification rate of 97.50%. The latter is meaningfully higher than the former. The contrast was statistically considerable ( $p = 0.025$ ). Accordingly, intervention with preventive nursing after urethroplasty for hypospadias in male children improved the compliance and satisfaction, thereby accelerating postoperative rehabilitation.

This study had some limitations, such as the small sample size and the short follow-up period. In future, the researchers will carry out a further study based on the expanded sample size and prolonged follow-up period, so as to benefit more patients *via* evaluating the advantages and disadvantages of the proposed intervention programme more objectively.

## CONCLUSION

There is an obvious advantage of preventive nursing on male children with hypospadias, which deserves popularisation and application in the clinical practice. It can reduce the postoperative complications, relieve postoperative pain, improve postoperative anxiety and depression, enhance nursing experience, and thus promote postoperative rehabilitation.

**ETHICAL APPROVAL:**

The study was approved by the Institutional Ethics Committee of Beijing Children's Hospital Affiliated to Capital Medical University Baoding Hospital (No. 2018-07; dated May 23, 2018).

**PATIENTS' CONSENT:**

Written informed consents were obtained to publish the data of the children.

**COMPETING INTEREST:**

The authors declared no competing interest. The manuscript contains original work that has neither been published nor has been submitted elsewhere.

**AUTHORS' CONTRIBUTION:**

XQS, SLG: Designed the study, prepared the manuscript, took accountability for the accuracy or integrity of the work.

WZ, JW: Collected and analysed the data.

BSZ, BY: Participated in acquisition, analysis, and interpretation of data, and drafted the manuscript.

All authors have read and agreed to the published version of the manuscript.

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