Application of Nursing Intervention Model to Improve the Maintenance Efficiency of Drainage Tube after Abdominal Surgery in Children

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Abstract

Establishment and application of nursing intervention mode improve the efficiency of pediatric abdominal drainage tube after the operation, the drainage tube to maximum effect. Selection of our department in February 2018 - August 2018 with drainage tube, a total of 1800 cases of children, aged 0-12, disease, catheter quantity and time no specificity. Will 1800 cases randomly divide into two groups, control group and experimental group 900 cases each. Two groups of cases of disease, age, gender, catheter slippage risk nursing evaluation, ability of independent activities, parents of children cultural degree has no statistical significance (P > 0.05); Intervention group drainage tube indwelling time, length of hospital stay, take off the tube rate is less than the control group, the difference was statistically significant (P < 0.05). Through the above means and methods, effectively improve the efficiency of the drainage tube, promoting children recover at an early date. Survey and analyze the influence effect factors of the drainage tube after abdominal surgery, establish and implement maintain drainage tube patency nursing intervention mode, can effectively prevent to take off the tube and the drainage tube maximum efficacy, reduce the postoperative complications and promote the children recover at an early date.

Key words: Applied Nursing, Pediatric Abdominal Surgery, Drainage Tube, Maintenance Efficiency

Aplicación del Modelo de Intervención de Enfermería para Mejorar la Eficiencia del Mantenimiento del Tubo de Drenaje Después de la Cirugía Abdominal en Niños

Resumen

El establecimiento y la aplicación del modo de intervención de enfermería mejoran la eficacia del tubo de drenaje abdominal pediátrico después de la operación, el tubo de drenaje al máximo efecto. Selección de nuestro departamento en febrero de 2018 - agosto de 2018 con tubo de drenaje, un total de 1800 casos de niños, de 0 a 12 años, enfermedad, cantidad de catéter y tiempo sin especificidad. Los 1800 casos se dividirán al azar en dos grupos, grupo de control y grupo experimental de 900 casos cada uno. Dos grupos de casos de enfermedad, edad, sexo, riesgo de deslizamiento del catéter, evaluación de enfermería, capacidad de actividades independientes, grado cultural de los padres de los niños no tienen significación estadística (P > 0.05); El tiempo de permanencia en el tubo de drenaje del grupo de intervención, la duración de la estancia hospitalaria, la tasa de extracción del tubo es menor que el grupo de control, la diferencia fue estadísticamente significativa (P <0.05). A través de los medios y métodos anteriores, mejore efectivamente la eficiencia del tubo de drenaje, promoviendo que los niños se recuperen en una fecha temprana. Examine y analice los factores de efecto de la influencia del tubo de drenaje después de la cirugía abdominal, establezca e implemente el modo de intervención de enfermería de permeabilidad del tubo de drenaje, puede prevenir eficazmente quitar el tubo y la eficacia máxima del tubo de drenaje, reducir las complicaciones postoperatorias y promover la recuperación de los niños en una fecha próxima.

Palabras clave: Enfermería Aplicada, Cirugía Abdominal Pediátrica, Tubo de Drenaje, Eficiencia de Mantenimiento

1. Project Background

Drainage is one of the most common and important basic techniques for abdominal surgery [1]. There are many types of surgical drainage tubes. Nurses need to manage the various tubes carried by patients, providing an important basis for performing treatment, observing the condition, judging the prognosis, and rescuing
critically ill patients and life support. Keeping the drainage tube unblocked is one of the focuses of our care [2]. Children with poor compliance, family rotation, lack of maintenance knowledge, inadequate professional ability of nurses, drainage tube blockage, slippage, and even unplanned extubation.

A total of 483 patients with indwelling drainage tubes in our department from June to December 2017 were counted. The investigation showed that 198 patients could not maintain the efficiency of the drainage tubes, accounting for 40% of the indwelling catheters. Analysis of the reasons: imperfect operation process in the pipeline maintenance process, insufficient attention of nurses, less fixed equipment, lack of family knowledge, lack of safety awareness, inadequate relevant propaganda and education and other factors lead to the phenomenon of blockage or detachment of pipeline during detention. To keep the drainage tube unobstructed and improve the drainage efficiency is the work goal of medical staff. Patients with indwelling drainage tubes after surgery find that when the drainage tube is loosely fixed, it is usually used to fix the drainage tube by repeated superimposed fixation. The risk of decoupling has been increased, and there are major safety hazards, which also increase the difficulty of nursing. In response to the above problems, we use the questionnaire to investigate and analyze relevant factors, use the drainage tube risk assessment form and the drainage tube maintenance record to confirm high-risk children, standardize the pipeline identification, improve the fixtures and methods, formulate the drainage tube maintenance process, and establish the drainage tube. Risk assessment sheets and maintenance records, strict technical practices and other methods. The use of our own portable drainage pants designed to effectively improve the efficiency of the drainage tube after abdominal surgery in children.

2. Target

According to the domestic and foreign related medical and nursing reports on the influencing factors of the efficacy of children's indwelling drainage tube and nursing measures, it provides a theoretical basis for this project. This study improved the methods and tools of pipeline fixation, and applied intervention mode to effectively prevent skin allergy, pipeline distortion, blockage and even slippage during previous drainage tube placement. Convenient drainage pants enhance the enthusiasm of children leaving the bed and reduce the phenomenon of drainage tube discount. Increase health education to improve the ability of family members to maintain drainage tubes and ensure the effectiveness of drainage tubes. In order to control the efficacy of the drainage tube, the quality of the nursing care link is controlled, and the intervention mode is applied and applied, and the cooperation between the nurse and the patient is strong.

3. Work Content and Implementation Steps

3.1 Established a Quality Improvement Project Team

The project leader is the team leader, the department head nurse, the specialist nurse, the research group and the health education quality controller are the members of the group. Projects such as project selection, literature inquiry, drainage pants production, pipeline care, data collection, quality tracking, and continuous improvement.

3.2 Identify Research Objects and Methods

3.2.1 Participants: A total of 1800 children with a drainage tube from February 2018 to August 2018 were enrolled in our department. The age ranged from 0 to 12 years. There was no specific choice for the number of diseases, tube placement and time.

3.2.2 Methods: 1800 children were randomly divided into two groups, 900 in the control group and 900 in the experimental group. The control group carried out the original perioperative nursing workflow, and the experimental group established and applied the nursing intervention mode to keep the drainage tube unobstructed. It includes seven parts: influencing factors analysis, confirmation of high-risk children, pipeline labeling management, improvement of fixtures and methods, easy-to-use drainage pants, establishment of drainage tube maintenance process, establishment of drainage tube risk assessment sheet and maintenance record sheet. The registration forms for indwelling drainage tubes were established in both groups. The operation mode, age, sex, type of drainage tube, indwelling time, maintenance equipment, maintenance method, patency and decannulation were recorded in detail.

3.3 Establishment and Application of Nursing Intervention Mode to Keep Drainage Tube Unobstructed

3.3.1 Determine the influencing factors

Use the checklist to find out the influencing factors of the project, use Plato, and formulate the improvement project focus.

<table>
<thead>
<tr>
<th>Defect items</th>
<th>Number of</th>
<th>Percentage</th>
<th>Accumulated</th>
</tr>
</thead>
</table>

1119
Improper fixing of pipeline | 124 | 25.36 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of regulatory processes</td>
<td>95</td>
<td>19.43</td>
</tr>
<tr>
<td>Family members/poor maintenance ability</td>
<td>85</td>
<td>17.38</td>
</tr>
<tr>
<td>Children with poor compliance</td>
<td>77</td>
<td>15.75</td>
</tr>
<tr>
<td>Other</td>
<td>108</td>
<td>22.09</td>
</tr>
<tr>
<td>Total</td>
<td>489</td>
<td>100</td>
</tr>
</tbody>
</table>

Statistical table of the proportion of influencing factors

3.3.2 Analysis of influencing factors
(1) Improper fixtures: Children who retain abdominal drainage tubes, urinary catheters, etc. often wear the drainage tubes through the whole trousers and out of the trousers feet. Or cut the cloth around the thighs of pants, or cut the crotch of pants and other methods to pull out the drainage pipe, which is cumbersome and easy to lead to the distortion of the drainage pipe. When the child is out of bed, the gastrointestinal decompression negative pressure aspirator is either held directly by the parent or by a plastic bag of various colors. The color and quantity of gastric juice cannot be effectively observed, and the height of drainage is not uniform and disordered. It is more difficult for parents with more children to care for their parents.
(2) The fixing method is incorrect: the nursing staff does not fix the exposed part of the drainage tube; the correct method is not used when fixing, resulting in loosening of the adhesive tape after fixing. Long-term indwelling of gastric tube in children can cause nasal secretions to increase. The adhesive tape for fixing gastric tube is easy to lose its stickiness and fall off when wet, and there is a risk of detachment. Fixed pipe part is too long to cause the child to pull out when turning over.
(3) The pipeline identification is not standardized: the drainage pipeline has no identification or unclear identification, and cannot be used as a reminder and warning function. A safe and effective early warning mechanism has not been formed. In particular, when a patient puts in a variety of pipes, it is easy to cause repeated pulling of the pipe, which increases the risk of disconnection due to the involvement.
(4) Self-factors of the child: Unconsciousness, agitation, and non-cooperation due to the role of anesthetic after surgery and the age of the child. The child and his family have been paralyzed for a long time, and they have thoughts of relaxation. When the body is turned over, the drainage tube is not protected and the pipeline is excessively involved. The material of the drainage tube is hard, which causes discomfort to the child after the tube is placed. The pain caused by turning over and moving cannot be tolerated.
(5) Factors accompanying family members: the cultural level, psychological state, and maintenance knowledge of the drainage tube of the accompanying family members are uneven, and the care after the child is placed in the hospital will have different degrees of influence.
(6) Inadequate quality control in pipeline nursing: there is a lack of systematic and standardized pipeline nursing and management systems in clinical nursing work. There is no standard assessment and maintenance basis for the drainage tube operation of the nursing staff, the monitoring of the quality of the care is not enough, and the details of the pipeline maintenance are not in place.

3.3.3 High-risk children confirmed
(1) Children with poor compliance such as crying and irritability; (2) children with malnutrition and skin edema; (3) children with poor maintenance ability; (4) children with pre-anesthesia, whose brain Changes in the uncontrolled behavior of the reticular ascending tissue or inhibition of the motor center are often accompanied by varying degrees of restlessness. The sensitivity to foreign body stimulation is highly prone to extubation; (5) children with comfortable changes due to pain after surgery.

3.3.4 Pipeline identification management
Various pipes are clearly identified to provide a reminder and a warning. Form a safe and effective early warning mechanism to ensure effective quality of care beforehand. The pipeline care is more standardized and more in place, and the continuous quality improvement of the child safety management is realized. The patient can use the pipe identification when the drainage pipe needs to be placed during the treatment and care. In our department, yellow is used for urethral catheter; green is used for T-shaped drainage tube, cholecystostomy tube, abdominal drainage tube; purple is used for gastric tube. Responsible nurses or duty nurses should fill in the date, name, notes and signature with black marker or ballpoint pen. The label is affixed to the outlet end of the drainage tube and the connection of the drainage bag pipe. In special cases, the label can be used only at the end...
of the drainage tube (such as gastrointestinal decompression within a week, indwelling catheterization within three days, etc.). After removing the logo, align and wrap it around the catheter. Fix the two layers tightly.

3.3.5 Improvement of fixtures and methods
The children with drainage tube after operation were provided with convenient drainage trousers invented by our nurses, color plastic clips, cartoon plastic bags, and fixed pipes with 3M tape. Because children with gastric tube indwelling for a long time can cause nasal secretions to increase, the adhesive tape of fixed gastric tube is easy to lose its stickiness and fall off when wet, and there is a risk of tube falling off. The improved method of gastric tube sticking in our department [3]: (1) Use toilet paper to clean the secretions and sweat around the nose, especially the tip of the nose, to keep dry. (2) Take 2cm long 3M tape, tear one end vertically from the middle to 1cm, tear two 1cm long tapes into clockwise and counterclockwise directions, cross-wound the gastric tube, attach the other end of the tape to the tip of the nose, and press it with your fingers slightly. (3) Take another 3cm long tape and stick the gastric tube on the child's cheek or ear. Its advantages are: ① 3M tape width is 2.5cm, the tape can completely cover the upper part of the nasal tip of the child without affecting breathing, and it is firmly adhered. (2) This fixing method avoids the adhesive tape contacting the lower part of the nasal cavity of the child. Even if there are secretions such as nasal mucus, it is convenient for parents to wipe gently with toilet paper without affecting the use effect of the adhesive tape. ③ 3M adhesive tape is suitable for sensitive skin of children. Tearing is painless, does not stick hair, can be repeatedly stuck, has low cost, simple operation and saves time and labor. The adhesive tape is wide in diameter and strong in viscosity, and can also be used for fixing abdominal cavity drainage tubes and urine tubes. Using the method of holding up the platform, the catheter is placed in the center of the adhesive tape, and the adhesive tape is adhered to each other for about 0.5cm, and then it is fixed on the thigh on the same side with this as the midpoint. It can be firmly pasted, the drainage tube will not shift, and the pressure of the tube on the delicate skin of children can be avoided.

3.3.6 Easy to design and use drainage pants
Prepare trousers or single pants, concealed or velcro, double zipper, half-fold rectangular fabric, hook. The portable drainage pants (see Fig. 1) is a suitable trouser according to the length of the patient, a long opening on one side of the trouser leg and a double-head adjustable zipper (length 18-22 cm). According to the height of the patient and the length of the drainage tube, a drainage tube is arranged on the leg 1 to surround the fixing device 3. The main body of the fixing device is a rectangular bag. The lower part of the rectangular cloth piece is sewn on the leg of the leg, and the upper part of the rectangular bag is movably connected to the lower part of the rectangular bag or the leg by a buckle or a Velcro. In use, various drainage tubes are taken out from the double-head adjustable zipper opening of the leg, and then wrapped around the drainage tube around the fixing device 3, and the dark buckle or the Velcro can be closed.

![Convenient drainage pants structure diagram](image)

During use, the caregiver can use various drainage tubes to pass through the double-head adjustable zipper opening of the trouser leg, and then surround and fix the drainage tube around the fixing device, and close the dark buckle or the velcro buckle. Convenient drainage pants reduce the distortion, compression and decoupling of the catheter when the child is out of bed after being put into use in our department. It greatly facilitates the patient's getting out of bed with the drainage tube, ensuring the smoothness of the drainage tube, increasing the comfort of the child and protecting the privacy, and improving the efficiency of the nurse. We sewed a cartoon-patterned piece of cloth on the trousers, which enhanced the effect of the mission and effectively stimulated the enthusiasm of the child to get out of bed, and the clinical use effect was good [4].

3.3.7 Develop a drainage tube maintenance process
According to the needs of children and their families, in order to strengthen the ability of children and their families to cooperate with the maintenance of drainage tubes. In addition to oral education, we have also
produced a colorful, easy-to-understand drainage tube health education prescription [5]. The contents are as follows: (1) Properly fix the drainage tube: the nurse will provide a plastic clip to fix the drainage tube. If the tape of the fixed pipe is loose, please ask the nurse to replace it. Nurses of children with gastrointestinal decompression will provide cartoon plastic bag device drains. For children who have a peritoneal drainage tube after abdominal surgery, the nurse provides and assists the family to use the convenient drainage pants to help the child get out of bed. After the drainage tube is pulled out, please cooperate with the nurse to collect the plastic clip and facilitate the drainage pants. (2) Keep the drainage smooth: Please pay attention to keep the drainage tube without folding, twisting and compression. Appropriate position can maintain good drainage efficiency. Please change your position under the guidance of medical staff. When turning over and getting out of bed, avoid excessive pulling and prevent disengagement. At any time, the drainage bag should not be higher than the wound (the stomach tube should be lower than the abdomen) to prevent the drainage fluid from causing infection, and the drainage bag should not be in contact with the ground. (3) Cooperate with the observation record: the medical staff will observe and record the amount, color and nature of the drainage fluid. Please do not dump the drainage fluid by yourself, so as to avoid the measurement error. If the dressing around the drainage tube is contaminated or wet, please contact the medical staff in time.

3.3.8 Establish a drainage tube risk assessment form and maintenance record sheet
The project team members jointly designed and produced the drainage tube risk assessment form and the drainage tube maintenance record sheet, and the data were collected by members of the nursing product management circle. Detailed records of the child's surgical method, age, gender, type of drainage tube, indwelling time, maintenance tools, maintenance methods, smoothness or not, whether to take off the tube. Dynamic observation of the postoperative drainage of the child with a drainage tube during the drainage period, is conducive to observing changes in the condition and assisting doctors in diagnosis. Medical staff regularly hold special seminars to analyze the factors affecting the efficacy of the drainage tube. Propose solutions to solve hidden dangers and defects in a timely manner, and effectively keep the drainage tube unblocked.

4. Evaluation

4.1 Evaluation Index

There were no significant differences in disease types, age, gender, catheter slip risk assessment, child self-activity, and parental education in the two groups (P>0.05).

<table>
<thead>
<tr>
<th>Project</th>
<th>Intervention group (n=900)</th>
<th>Control group (n=900)</th>
<th>T value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>3.9</td>
<td>4.2</td>
<td>4.020</td>
<td>0.173</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>585</td>
<td>563</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>315</td>
<td>337</td>
<td>1.164</td>
<td>0.303</td>
</tr>
<tr>
<td>Nursing assessment of catheter slippage risk (score)</td>
<td>10.8</td>
<td>11.1</td>
<td>-1.104</td>
<td>0.271</td>
</tr>
<tr>
<td>Self-activity of children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will walk</td>
<td>468</td>
<td>480</td>
<td>0.723</td>
<td>0.422</td>
</tr>
<tr>
<td>Don't walk</td>
<td>510</td>
<td>522</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior high school and below</td>
<td>260</td>
<td>252</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College and above</td>
<td>130</td>
<td>126</td>
<td>0.327</td>
<td>0.849</td>
</tr>
</tbody>
</table>

4.1.2 According to the relevant literature [5], the evaluation index of this study was determined. The risk assessment index of catheter slippage in hospitalized patients showed that the risk of catheter slippage was divided into: degree I, II degree, III degree, cumulative risk of multiple pipelines, I degree: score < 8 points, there is the possibility of catheter slippage; II degree: score of 8-12 points, prone to catheter slippage; III degree: score > 12 points, catheter slippage will occur at any time.

4.1.3 The survey score was expressed by X±S. Correlation analysis was performed between the influencing factors and the devascularization and drainage. The difference was statistically significant at P<0.05.
Table 2. Comparison of indwelling time, hospitalization time and decoupling rate of two groups of drainage tubes

<table>
<thead>
<tr>
<th></th>
<th>Test group 900</th>
<th>Control group 900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>Indwelling time</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>The number of days in hospital</td>
<td>12.5</td>
<td>17</td>
</tr>
<tr>
<td>Decoupling rate</td>
<td>8</td>
<td>52</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>$X^2$</td>
<td>-1.894</td>
<td>9.158</td>
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</table>

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>$P$</td>
<td>0.04</td>
<td>0.002</td>
</tr>
</tbody>
</table>

4.2. Effect

4.2.1 Improvement before and after Plato

4.2.2 Catheter slippage rate and blockage rate before and after improvement

4.2.3 Maintenance efficiency of drainage tube before and after improvement
5. Discuss

5.1 Convenient Drainage Pants Keep the Drainage Tube Clear

The convenient drainage pants have been put into use in the general surgery of our hospital for nearly one year, which not only reduces the distortion, compression and decoupling of the catheter caused by the children leaving the bed, but also increases the comfort of the child and protects the child. Privacy also improves the efficiency of nurses. The cartoon-shaped cloth piece is used at the fixed leg of the trouser leg to enhance the effect of the mission and effectively stimulate the enthusiasm of the child to get out of bed.

5.2. Improved Fixtures and Methods to Prevent Catheter Slippage

The 3M silicone comfort tape has a width of 2.5cm and the tape can completely cover the tip of the child's nose. Does not affect the breathing, paste firmly, avoiding the tape under the nose of the child. Even if there is a secretion such as a snot, it is convenient for the parents to gently dry with the toilet paper, which will not affect the use of the tape. 3M silicone comfort tape, suitable for sensitive skin in children. It is painless, non-sticky, can be pasted repeatedly, low cost, simple operation, saving time and effort. The tape is wide and viscous and can also be used to secure the abdominal drainage tube and the urinary catheter. Using the high-lift platform fixation method, place the catheter in the center of the tape, stick the tape to about 0.5 cm, and then fix it on the same side of the thigh. It can be firmly attached, the drainage tube will not be displaced, and the tube will be prevented from causing pressure on the delicate skin of the child. The brightly colored drainage clips and cartoon plastic bags reduce the slippage of the catheter and stimulate the enthusiasm of the child to get out of bed.

5.3. Strengthened the Quality Control of Drainage Tube Nursing

The drainage tube maintenance process was developed to provide necessary specialist training for new nurses. All nurses conducted simulation training on drainage tube slippage to improve risk prevention awareness. The department will include accidental extubation in the scope of nursing quality management. The department will hold nursing safety seminars from time to time to analyze the hidden dangers of the department's drainage tube nursing. And put forward preventive measures to improve nurses' awareness of precautionary care and prevent complications of drainage tube. The establishment and application of the risk assessment form and the maintenance record sheet of the drainage tube not only regulate the nursing records of the drainage tube, but also greatly improve the practical ability of the nursing staff to observe and maintain the drainage tube.

5.4. Enhanced Family Members' Ability to Maintain Drainage Tubes

Produce and distribute prescriptions for health education of drainage tubes, with detailed pictures and detailed contents. Effectively guide parents to master maintenance points and coordination matters. After the health education prescription was put into clinical use, it had a satisfactory effect on the maintenance of the drainage tube and the prevention of complications.

In summary, there are many types of surgical drainage tubes. In order to guide the accumulation of pus, blood and liquid in the body tissue or body cavity to prevent infection and affect wound healing [6]. Keeping the patency of the drainage tube plays an important role in the recovery of the child. Nursing staff need to manage the various tubes carried by the child, providing an important basis for treatment, observation of the condition, prognosis, and even life-saving [7]. This study shows that the factors affecting the efficiency of drainage tube include improper fixing devices, incorrect fixing methods, non-standard pipeline marking, body factors, factors of accompanying family members, factors of medical staff, imperfect quality control of pipeline nursing links
and so on. In view of these factors, the research group established and implemented nursing intervention mode to keep the drainage tube unobstructed. It includes influencing factors analysis, confirmation of high-risk children, pipeline labeling management, improvement of fixtures and methods, easy use of drainage pants, establishment of drainage tube maintenance process, establishment of drainage tube risk assessment sheet and maintenance record sheet to provide systematic and individualized drainage tube maintenance guidance for children. It improves the maintenance ability of family drainage tube, enhances the compliance of children, significantly reduces the rate of detachment, reduces the complications of catheterization, and improves the efficiency of drainage tube after abdominal surgery in children.

References


