

Analysis of the Application and Effect of Homemade Medical Scrotal Support Shorts

Jianbin Cheng*, Xiaohui Liu, Lin Lin

Fujian Provincial Geriatric Hospital (Fujian Provincial College of Vocational Health Technology Teaching Hospital), Fuzhou 350003, Fujian Province, China

*Corresponding author: Jianbin Cheng, 1157367929@qq.com

Copyright: © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* To design and manufacture medical scrotal support shorts for patients with enlarged scrotum and observe its application and effect. *Methods:* 40 patients with enlarged scrotum admitted to the basic surgery department from February 2021 to March 2023 were selected and divided into a test group and a control group according to their time of admission, with the test group using scrotal support shorts and the control group using ordinary shorts without scrotal support pockets or diapers. *Results:* The complication rate of skin injury in the scrotum and the surrounding inguinal area of the patients in the test group was significantly lower than that of the control group ($P < 0.01$). The medical cost covered by patients in the test group was significantly lower than that of the control group ($P < 0.01$) and the hospitalization satisfaction of the patients in the test group was significantly higher than that of the control group ($P < 0.01$). The difference in the therapeutic effect of the test groups was statistically significant when compared with the control group ($P < 0.05$). *Conclusion:* Homemade medical scrotal support shorts reduced the local enlargement of the scrotum and bleeding, but also protected the scrotum and the surrounding skin to prevent secondary injuries. The process of patient care was simple and promoted their recovery. The length of hospitalization was also decreased, the burden of health care costs was reduced, and the overall comfort and satisfaction of the patient was improved.

Keywords: Enlarged scrotum; Medical scrotal support shorts; Nursing care

Online publication: February 26, 2024

1. Introduction

Scrotal enlargement is defined when the scrotal skin and its contents (sheath membrane, testis, epididymis, and spermatic cord) have lesions, or when abdominal contents (ascites, viscera) descend into the scrotum, causing an increase in scrotum volume. Scrotum edema is observed as a spherical swelling, and in severe cases, it may engulf the penis and cause swelling, pain, burning sensations during urination, discomfort, and restricted activity^[1]. Scrotum edema commonly occurs in elderly patients and requires timely treatment and management. The flow of blood and lymphatic fluid can be restored by elevating the scrotum, thus reducing local swelling and pain^[2]. This study is based on the original independent research and development of medical scrotal support (national utility model patent ZL201921389875.X) based on the improvement, design, and production

of new medical scrotal support shorts. The shorts can be designed to the patient's needs and are disposable, making them more hygienic and avoiding cross-infection. In this study, the medical scrotal support shorts were clinically applied and managed to achieve satisfactory therapeutic effects.

1. Information and methods

1.1. General information

40 patients with enlarged scrotum admitted in Fujian Province from February 2021 to March 2023 were selected and divided into the test group and the control group according to their time of admission. The test group consisted of 8 patients aged < 65 years old (accounting for 40% of the total), and 12 patients aged \geq 65 years old (accounting for 60% of the total). The control group consisted of 5 patients aged < 65 years old (accounting for 25% of the total) and 15 patients aged \geq 65 years old (accounting for 75% of the total). The two groups were screened according to age, gender, education, disease history, and other general information, and the results were not statistically significant ($P > 0.05$). Inclusion criteria: able to communicate properly and consent; exclusion criteria: those who do not want to participate in the study.

1.2. Methods

1.2.1. Production of medical scrotal support shorts

The medical scrotum support shorts (**Figure 1**) were made of cotton. The front part has a front flap and the shorts were equipped with a scrotal support pocket and scrotal penis isolation cloth, and the waist of the pants was designed with an elastic band. The scrotal support pocket consisted of a support cloth and a connecting rope. The connecting rope was connected to the waist and was removable. The scrotum pocket part was made of cloth and a connecting rope. The connecting rope was connected to the fixed buckle at the waist for removal and length adjustment. Furthermore, the pocket size was compatible with the size of a scrotum. The scrotum penis isolation cloth was fixed on the left side of the scrotum pocket, and was compatible with the size and length of the penis.



Figure 1. The overall appearance of medical scrotal support shorts

1.2.2. Application method

Patients in the control group wore ordinary shorts or diapers without the scrotal support bag. Patients in the test group wore medical scrotal support shorts just like ordinary shorts, but the scrotum was put on the inner surface of the scrotal support bag for support. According to the severity of the scrotal enlargement, the connecting rope was adjusted according to the waist and was tied to a fixed buckle. The scrotal and penis isolation cloth was

positioned between the scrotum and the penis, and the shorts were adjusted to ensure the patient's genitals were comfortable. When inserting the indwelling catheter or going to the toilet, the penis was passed through the front flap. The medical scrotal support shorts were made by nurses and professional seamstresses in different sizes and models, according to the patient's body shape and severity of scrotal swelling. The shorts were also disposable, to achieve personalized nursing care, enhance patient experience, and prevent cross-infection. Although medical scrotal support shorts can also be used as preventive measures for individuals with a high risk of developing an enlarged scrotum, the risk assessment should be strictly monitored [3], and the shorts should not be used blindly.

1.3. Evaluation indexes

Evaluation indices were conducted based on the complication rate of the scrotum and its surrounding area, the rate of scrotal enlargement cure, and the patient's hospitalization satisfaction. Necessary adjustments were made by the nurse in charge based on the patient's conditions during hospitalization, and the process and time taken for recovery were recorded in detail. The patients' feelings were also cared for. The patients were also closely monitored for signs of complications such as scrotal or peripheral skin injuries. The number of incidences, time of occurrence, and whether they were related to the enlarged scrotums or conditions were also recorded. The "Implementation Guidelines for the Assessment Standards of Tertiary Hospitals" was combined with the Likert's standardized assessment guidelines [4]. Both were combined with the patient satisfaction rating scale developed by the Likert Scale to meet the clinical status quo, and a survey regarding patient satisfaction was conducted. The data of the research subjects in the test group and the control group were compared and analyzed.

1.4. Statistical methods

The acquired data were statistically analyzed using Excel 2019 and SPSS 25.0 software. Measurement data were expressed as mean ± standard deviation and compared using the *t*-test; count data were expressed as cases and percentages and compared using the chi-square (χ^2) test. Results were considered statistically significant at $P < 0.05$.

2. Results

2.1. Comparison of the incidence of skin injury complications in the scrotum and surrounding areas

There were 5 cases (25.00%) of skin injury complications in the test group and 17 cases (85.00%) in the control group, and the difference between the two groups was statistically significant ($\chi^2 = 7.88$, $P < 0.01$), as shown in Table 1.

Table 1. Comparison of the incidence of skin injury complications between the two groups

Group	Case, <i>n</i>	Complications	No Complications	Total complication rate	χ^2	<i>P</i>
Test group	20	5	15	25%	7.88	0.006
Control group	20	17	3	85%		

2.2. Comparison of medical costs related to scrotal enlargement

The medical costs covered by patients in the test group were 156–268 (212 ± 79.20) yuan, and 328–426 (377 ±

69.30) yuan in the control group. The differences between the two groups were statistically significant ($P < 0.01$), as shown in **Table 2**.

Table 2. Comparison of medical costs associated with scrotal enlargement between the two groups

Group	Case, <i>n</i>	Medical cost range	<i>t</i>	<i>P</i>
Test group	20	156–268	28.45	0.005
Control group	20	328–426	63.21	

2.3. Comparison of patients' hospitalization satisfaction

The number of hospitalization days in the test group was 4–7 days/cases (5.5 ± 2.24 days/cases), and the number of patients who were satisfied with hospitalization was 18 (90.00%). On the other hand, the number of hospitalization days in the control group was 9–14 days/cases (11.5 ± 4.18 days/cases), and the number of people who were satisfied with hospitalization was 10 (50.00%); the difference between the two groups were statistically significant ($\chi^2 = 3.62$, $P < 0.01$), as shown in **Table 3**.

Table 3. Comparison of hospitalization satisfaction between the two groups

Group	Case	Satisfied	Unsatisfied	Satisfaction rate	χ^2	<i>P</i>
Test group	20	18	2	90%	3.62	0.003
Control group	20	10	10	50%		

3. Discussion

The medical scrotal support shorts were able to support the scrotum, prevent friction between the scrotum, penis, and surrounding skin, and reduce the incidence of skin injury complications, secondary injuries, and pain. Elevation of the scrotum can improve blood circulation in the scrotal area, accelerate patient recovery, shorten hospitalization days, reduce hospitalization costs, and improve patient satisfaction^[5,6]. It has been reported that the use of diaper-type shorts to position the scrotum in the inner semicircular bag was able to effectively elevate the scrotum^[7,8]. However, this method is not very visually pleasing, increasing the possibility for the patient to have psychological burden, and may damage the scrotum due to friction. Therefore, in the clinical practice of this study, the product was designed to have a similar appearance to ordinary four-cornered shorts, which reduces the patient's discomfort and psychological burden. The overall material is made of cotton, which is soft and comfortable and is hypoallergenic. The support bag can elevate the scrotum, and the scrotal-penile isolation cloth isolates the scrotum from the penis to avoid secondary damage. All these factors can enhance the therapeutic effect and overall comfort of the patients^[9].

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Zhu H, 2014, Comparative Analysis of Clinical Treatment of Scrotal Edema in the Elderly. *Chinese Journal of Gerontology*, 34: 3349.

- [2] Li Q, Li Q, Xu X, et al., 2002, Application Method of Homemade Scrotal Towel. *Journal of Practical Nursing*, (1): 41.
- [3] Zhang C, Yang W, Zhuang X, 2017, Application of Homemade Scrotal Edema Pads in Patients with Cirrhosis with Massive Ascites Complicating Scrotal Edema. *Qilu Nursing Journal*, (22): 125–126.
- [4] China Hospital Association, 2011, Guidelines for the Implementation of Accreditation Standards for Tertiary Comprehensive Hospitals. Beijing: People’s Health Publishing House, 5.
- [5] Yang C, Chu L, Ma J, et al., 2014, Application of Diaper-Type Shorts after High Inguinal Hernia Ligation and Testicular Descent Fixation Belt in Pediatric Patients. *Chinese Journal of Practical Nursing*, 30(11): 54–55.
- [6] Wan W, Liu F, Che X, et al., 2021, Research on the Application Effect of Scrotal Cold Compress Patch in Reducing Pain after Testicular Puncture Patients. *Chinese Sexual Science*, 30(6): 7–10.
- [7] Shen X, Guan X, Bai Y, et al., 2020, Application Effect of Homemade Surgical Glove Airbag Bag in Reducing Scrotal Edema after Inguinal Hernia Surgery. *Systemic medicine*, 5(24): 150–153.
- [8] Cao L, Yang Y, Zhou Y, et al., 2019, Development and Application of Silicone Scrotal Support Pads for Bedridden Patients. *Journal of Nursing*, 26(13): 74–76.
- [9] Cheng Y, Li M, Ye C, et al., 2019, Analysis of the Efficacy of Homemade Scrotal Support in the Treatment of Varicocele. *Journal of Electrocardiography (Electronic Edition)*, 8(2): 127–129.

Publisher’s note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.