ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

CHOICE OF A METHOD FOR ELIMINATION OF URETHRALCUTANEOUS URINARY FISTULA AFTER CORRECTION OF HYPOSPADIAS

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Abstract: An analysis was conducted on the treatment outcomes of 46 patients from January 2021 to August 2023 who developed urethrocutaneous fistulas following hypospadias repair. In 25 patients (54.3%) with fistula sizes less than 10 mm, closure was performed using local penile tissues and the tunica vaginalis of the testis. In 21 patients (43.8%) with fistulas larger than 10 mm, scrotal skin was used to close the penile skin defect. During a three-month follow-up period, no recurrence of urethrocutaneous fistulas was observed in any case.

Keywords: hypospadias, tunica vaginalis of the testis, urethrocutaneous fistula

ВЫБОР СПОСОБА ЛИКВИДАЦИИ КОЖНО-УРЕТРАЛЬНОГО МОЧЕВОГО СВИЩА ПОСЛЕ КОРРЕКЦИИ ГИПОСПАДИИ

Аннотация: Выполнен анализ результатов лечения 46 пациентов за период с января 2021 по август 2023 года с кожно-уретральными мочевыми свищами, сформировавшимися после коррекции гипоспадии. При размере свища менее 10 мм у 25 (54,3%) пациентов выполнено ушивание свища с использованием местных тканей полового члена и вагинальной оболочки яичка. Закрытие дефекта кожи полового члена кожей мошонки выполнили у 21 (43,8%) больного, когда диаметр кожно-уретрального свища был более 10 мм. Во всех случаях при наблюдении в течение трех месяцев рецидива кожно-уретрального мочевого свища не было.

Ключевые слова: гипоспадия, вагинальная оболочка яичка, кожно-уретральный свищ

Introduction

More than 300 surgical procedures have been proposed for the treatment of patients with hypospadias [1]. The reason for such a large number of procedures is the fact that none of them provide consistently good results for different types of hypospadias. However, in recent years, with improvements in surgical techniques and the use of modern suture materials that contribute to the successful correction of hypospadias, the number of surgeries performed in various centers has significantly increased.

Nevertheless, the complication rate following different types of urethroplasty remains high. The most frequently observed complication after hypospadias repair is urethrocutaneous fistula formation, with an incidence ranging from 3% to 33%, regardless of the type of

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

surgical intervention [1]. Factors influencing fistula formation include the type of hypospadias, the patient's age at the time of surgery, the width of the urethral plate, and the quality of the suture material used for urethroplasty. Kwon T. et al. demonstrated that the complication rate in hypospadias repair is lower in children aged 4 to 6 months [4]. Another unfavorable factor is a narrow urethral plate, which is used to form the urethra [5].

The choice of surgical method for managing complications remains an issue. Some urologists advocate for multi-stage reconstructive surgeries [6], while others prefer single-stage procedures using various tissues from adjacent areas, such as the peritoneal vaginal tunic or the dartos fascia of the scrotum [7]. Thus, there is no consensus on this matter to date.

The aim of this study is to evaluate the treatment outcomes of patients with urethrocutaneous fistulas that developed after primary urethroplasty for hypospadias using different fistula closure methods.

Materials and Methods

An analysis was conducted on the treatment outcomes of 46 patients from January 2021 to August 2023 who developed urethrocutaneous fistulas following hypospadias repair.

The fistulas were located in the coronal sulcus in 11 patients and in the penoscrotal junction in 8 cases. The distribution of urethrocutaneous fistula openings along the penile shaft was as follows:

Distal part of the penis – 9 patients

Midshaft – 10 patients

Proximal part of the penis – 8 patients

The fistula opening size (largest diameter) was less than 10 mm in 25 patients (54.3%), with an average size of 8.3±0.3 mm. In contrast, fistulas larger than 10 mm were observed in 21 cases (43.8%), with an average size of 23.3±0.5 mm.

The next step in the study involved analyzing the frequency and distribution of fistulas along the penile shaft and their sizes (Table 1).

Table 1.

Distribution of patients with cojno-urethral cysts and their size and

distribution (n=46).

	Up to 10 mm	**More than 10 mm**
Distal part of penis	6 (13,0%)	3 (6,5%)
Mid part of penis	5 (10,8%)	5 (10,8%)

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

Proximal part of penis	3 (6,5%)	5 (10,8%)
Penoscrotal angle	5 (10,8%)	3 (6,5%)
Coronal sulcus	6 (13,0%)	5 (10,8%)
Total	25 (54,3%)	21 (43,8%)

Results

The choice of surgical method for the closure of urethrocutaneous fistulas depended on their diameter (Table 2).

For fistulas smaller than 10 mm (25 patients), closure was performed using local penile tissues and the tunica vaginalis of the testis.

For fistulas larger than 10 mm (21 patients), due to the higher risk of recurrence, the penile skin defect was closed using scrotal skin. After creating a penoscrotal anastomosis, separation of the penile shaft from the scrotum was performed three months later.

During the three-month follow-up period, no recurrence of urethrocutaneous fistulas was observed in any of the cases.

Table 2.

Surgical interventions in patients with cutaneous urethral urinary fistulas depending on size (n=16).

Urethral-Cutaneous Fistula	
Diameter less than 10 mm	**Diameter over 10 mm**
Fistula closure using local tissue or vaginal membrane of the testicle	Fistula suturing using scrotal skin

Discussion

The exact reasons for the recurrence of urinary fistulas remain unclear. In addition to surgical technique errors or postoperative management issues, a plausible explanation for recurrent fistula formation is impaired local vascularization and the development of scar tissue on the ventral surface of the penile skin. Efforts to improve the success rate of fistula repair have led to the development of various surgical techniques, including "simple" closure, skin flap transposition, multilayer reconstruction, and staged urethroplasty.

Karabulut R. et al. found that in cases where additional tissues (such as the tunica vaginalis of the testis or others) were not used for urethrocutaneous fistula repair, the recurrence rate was as high as 50% [3]. However, when the tunica vaginalis was used as an additional layer in secondary surgeries, no cases of fistula recurrence were observed. This suggests that the likelihood of recurrence increases due to scarring in the surrounding tissues. Based on our experience, the use of the tunica vaginalis as an additional layer in the primary fistula repair significantly reduces recurrence rates, thereby minimizing the psychological trauma of repeated surgeries for the patient.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

For large urethrocutaneous fistulas, Gapany C. et al. used preputial skin and achieved an 89% success rate [2]. However, due to religious and cultural practices in Uzbekistan, where circumcision is performed on all male children, preputial skin was unavailable for surgical use. Instead, for fistulas larger than 10 mm, we closed the skin defect by embedding the penile shaft into a scrotal incision, followed by subsequent separation of the penoscrotal anastomosis. This approach resulted in zero cases of fistula recurrence.

Conclusion

The choice of surgical technique for urethrocutaneous fistula repair depends on its size and location.

For fistulas larger than 10 mm, the preferred method is closure with skin defect reconstruction by embedding the penile shaft into the scrotum, followed by staged separation.

For fistulas smaller than 10 mm, simple closure is appropriate; however, it is advisable to use the tunica vaginalis as an additional reinforcing layer to prevent recurrence.

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