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Electroacupuncture for Stress Urinary Incontinence after Rectal Tumour Surgery: A Case Report

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1. Abstract

In digestive system tumours, low rectal cancer accounts for approximately 70-80%, and surgical intervention is the preferred treatment method. However, a major postoperative complication is urinary incontinence. Although not life-threatening, prolonged urinary incontinence can lead to urinary system disorders, significantly impacting patients' quality of life, daily activities, and work, while also imposing substantial costs on patients and the healthcare system. Modern medical approaches such as medication and pelvic floor muscle training have shown limited effectiveness, necessitating the need for an economical, efficient, safe, and side-effect-free treatment. Acupuncture offers advantages in this area, providing a new direction for patients with postoperative stress urinary incontinence following rectal cancer surgery. We report a case of severe stress urinary incontinence in a patient who experienced no improvement with prior Western medical treatments. After five times of electroacupuncture, the patient showed a significant reduction in urine leakage. This paper summarizes the case with confirmed efficacy, aiming to promote its clinical application.

2. Introduction

According to global cancer statistics published in 2022, colorectal cancer ranks among the top three in incidence and mortality rates [1]. The "2023 Edition of the Chinese Guidelines for Diagnosis and Treatment of Colorectal Cancer" recommends abdomin-perineal resection (APR) as the preferred treatment for low rectal cancer. However, while respecting the pathological tissue, surgical treatment can easily damage the corresponding nerves and muscles in the pelvic region, leading to pelvic floor dysfunction and an increased risk of urinary incontinence [2-3]. Researchers have studied the quality of life in patients after colorectal surgery, finding that those who undergo APR may experience symptoms like urinary frequency and incontinence, with APR patients having the worst postoperative function and symptom scores [4]. The occurrence of postoperative stress urinary incontinence (SUI) forces patients to rely on diapers, with involuntary urine leakage severely affecting daily life. The associated odor and psychological burden can lead to anxiety, depression, and social withdrawal. Western medicine recommends non-surgical treatments for postoperative urinary incontinence, such as pelvic floor muscle exercises, bladder training, electrical stimulation, and lifestyle interventions. However, these treatments often have long cycles, slow onset of effects, and issues like ineffective exercises and poor patient compliance [5]. Acupuncture, a traditional Chinese medicine external treatment, has the advantages of being simple, safe, and effective. A multi-centre randomized controlled clinical study by Chen Yuelai et al. [6], found that electroacupuncture in the lumbosacral region effectively reduced urine leakage in women with stress urinary incontinence [6]. Here, we report a case of postoperative SUI in a male patient after APR surgery, treated with electroacupuncture, combined with traditional Chinese medicine syndrome differentiation and treatment principles.

3. Case Report

This study reports a case of a 75-year-old male patient with locally advanced rectal cancer. T3aN2a, MRF-. EMVI. After multiple

radiotherapy and chemotherapy sessions, the patient underwent APR surgery under general anesthesia on May 8, 2018, at Fudan University Shanghai Cancer Centre, followed by artificial stoma creation for bowel movements. Post-discharge, the patient experienced urinary frequency and occasional incontinence, with an average daytime urinary frequency of once per hour and nocturia 2-3 times per night. The patient did not initially pay much attention to these symptoms. Three months before presentation, after moving houses, the patient suddenly experienced severe urinary incontinence, requiring five diapers per day, which severely impacted his quality of life. The patient sought treatment at Shanghai Tongren Hospital, where urine routine tests showed no significant abnormalities, and bladder ultrasound revealed no residual urine. Treatment with Chinese patent medicine resulted in slight symptom improvement, but daily diaper use continued. On May 15, 2024, the patient sought treatment at the Urology Department of Huadong Hospital affiliated with Fudan University, where he was prescribed mirabegron 50mg once daily and advised to keep a voiding diary while performing pelvic floor muscle exercises. On June 13, 2024, the patient reported persistent urinary incontinence, long-term diaper use, no urinary urgency, no dysuria, nocturia 2-3 times, and occasional backache. The patient then sought treatment at Longhua Hospital affiliated with Shanghai University of Traditional Chinese Medicine. Based on the patient's complaints, symptoms, and previous examination reports, along with tongue coating and pulse diagnosis, the patient was diagnosed with urinary incontinence in traditional Chinese medicine, categorized under "enuresis" due to kidney qi deficiency.

Following the treatment principle of enriching kidney qi and strengthening and consolidating the bladder, we selected the following acupuncture points: Shenshu (BL23), Pangguangshu (BL28), Ciliao (BL32), Zhonglüshu (BL29), Weizhong (BL54), Fuliu (KI8), and Taixi (KI3). Disposable sterile acupuncture needles (25*40mm) were used to stimulate these points until the patient experienced the sensation of deqi (soreness, numbness, distension). The needles were retained for 20 minutes. Electroacupuncture was applied to Shenshu (BL23) and Pangguangshu (BL28) on both sides, with a frequency of 2Hz, using continuous wave stimulation at an intensity comfortable for the patient. Treatment was administered three times a week.

4. Results

The patient's voiding diary revealed (see Table 1) that before acupuncture treatment, the patient's maximum daytime urinary incontinence volume could reach 790g, with only a few instances of less than 300g, averaging at around 500g; nighttime urinary incontinence could reach a maximum of 720g, with five consecutive nights between June 8 and June 12 exceeding 250g. The patient underwent five acupuncture treatments on June 13, 16, 18, 20, and 23. After the first acupuncture session on June 13, the patient experienced a significant reduction in nighttime urinary incontinence, with only 70g of leakage compared to 480g the previous night, a reduction of nearly sixfold. Compared to the highest recorded leakage, this was a reduction of nearly tenfold. Records on June 15 and 23 showed only 20g of leakage, with post-acupuncture nighttime urinary incontinence consistently less than before treatment, never exceeding 115g, with most instances below 100g. Daytime urinary incontinence also decreased by 20g after the initial acupuncture session and continued to steadily decrease, reaching a minimum of 220g, a nearly threefold reduction from the pre-treatment maximum of 790g. The total daily urinary incontinence volume showed a significant downward trend (see Figures 1, 2, and 3). The patient reported that after each treatment, their diapers felt much drier at night, with the patient stating that the 20g recorded leakage was equivalent to none, demonstrating rapid effectiveness.

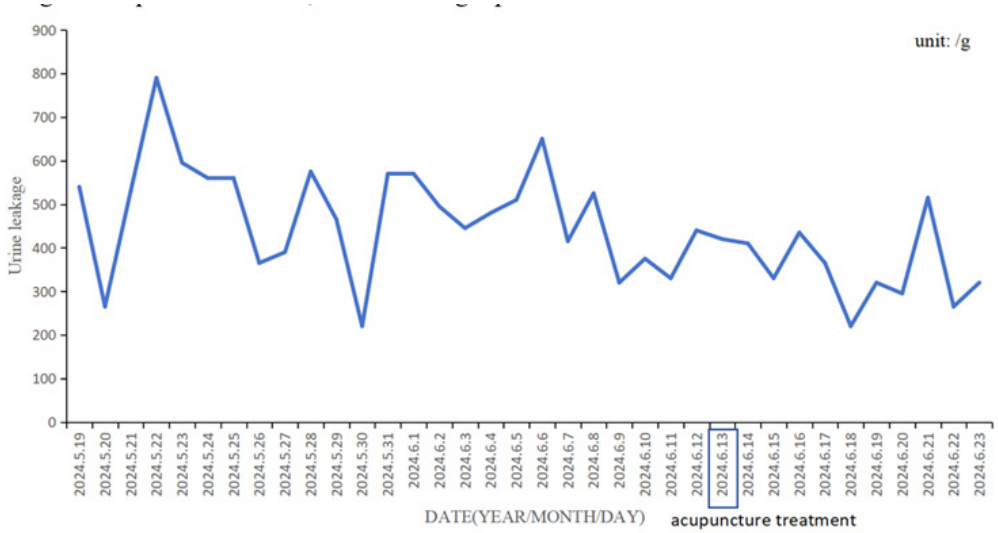

Figure 1: Total amount of urinary incontinence during the day.

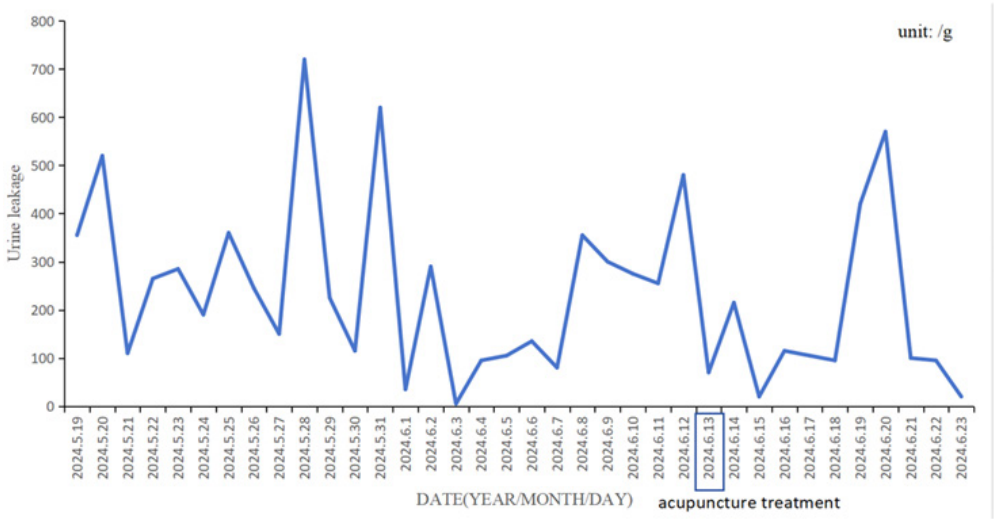

Figure 2: Total amount of urinary incontinence at night.

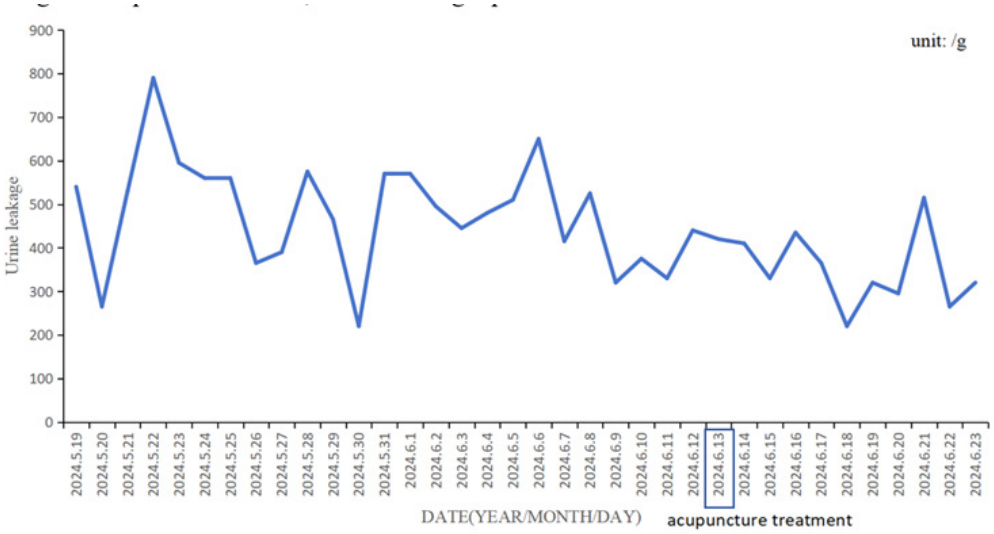

Figure 3: Total daily urinary incontinence.

Table 1: Patient's urination diary.

Date	Day/Night	Self-excretion volume	Total	Urine leakage	Total	Total
5.19	Day	420+100+30	550	540	540	1090
	Night	400+380	780	355	355	1135
5.20	Day	315+90	405	265	265	670
	Night	320+215	535	520	520	1055
5.21	Day	125+45	170	420+120	530	700
	Night	150+250+200	600	110	110	710
5.22	Day	410+50+50	510	335+215+240	790	1300
	Night	250+390	640	265	265	905
5.23	Day	125+45+30	200	595	595	795
	Night	320+415	735	285	285	1020
5.24	Day	350+50+30	430	435+125	560	990
	Night	410	410	190	190	600
5.25	Day	210+40+65	315	260+300	560	875
	Night	380+220	600	360	360	960
5.26	Day	180+50	230	245+120	365	595
	Night	410+210	620	245	245	865
5.27	Day	210+40+50	300	50+340	390	690
	Night	380+400	780	150	150	930
5.28	Day	300+115	415	220+355	575	990

	Night	410	410	720	720	1130
5.29	Day	280+50+30	360	345+120	465	825
	Night	280	280	225	225	505
5.30	Day	410+40	450	220	220	670
	Night	300+410	710	115	115	825
5.31	Day	210	210	250+320	570	780
	Night	410	410	620	620	1030
6.1	Day	50+30+20	100	335+235	570	670
	Night	110+100	210	35	35	245
6.2	Day	115+20+20	145	295+200	495	640
	Night	140+385	425	290	290	715
6.3	Day	185+40	225	295+150	445	670
	Night	180+390	570	5	5	575
6.4	Day	405+20+20	445	440+40	480	925
	Night	285+400	685	95	95	780
6.5	Day	150+30+30	210	240+270	510	720
	Night	190+200	390	105	105	495
6.6	Day	200+30+20	250	400+250	650	900
	Night	350+200	550	135	135	685
6.7	Day	200+50+30	280	300+115	415	695
	Night	395+410	805	80	80	885
6.8	Day	100+40	140	90+220+215	525	665
	Night	410	410	355	355	765
6.9	Day	250+40+30	320	220+100	320	640
	Night	300+200	500	300	300	800
6.10	Day	205+40+30	275	375	375	650
	Night	400	400	275	275	675
6.11	Day	190+40	230	330	330	560
	Night	275+200	475	255	255	730
6.12	Day	200+50+20	270	395+45	440	710
	Night	420+100	520	480	480	1000
6.13	Day	100+50+70	220	270+50+100	420	640
	Night	230+40	270	70	70	340
6.14	Day	40+50+70	160	205+205	410	570
	Night	250+190	440	215	215	655
6.15	Day	180+50+60	290	220+110	330	620
	Night	170+310	480	20	20	500
6.16	Day	110+50+40+50	250	435	435	685
	Night	100+240	340	115	115	455
6.17	Day	100+30+40	170	365	365	535
	Night	60+110+340	510	105	105	615
6.18	Day	150+50+60	260	115+105	220	480
	Night	170+390	560	95	95	655
6.19	Day	395+50+50	495	135+185	320	815
	Night	300+400	700	420	420	1120
6.20	Day	200+100+80	380	245+50	295	675
	Night	400	400	570	570	970
6.21	Day	120+100+50	270	285+230	515	785
	Night	300+390	690	100	100	790
6.22	Day	180+100+70	350	130+135	265	615
	Night	300	300	95	95	395
6.23	Day	300+30+40	400	200+120	320	720
	Night	325+125	445	20	20	465

Note: Unit: /g.

5. Discussion

The pathogenesis of stress urinary incontinence (SUI) remains unclear, but it is believed to be related to factors such as reduced function of the internal urethral sphincter, damage to pelvic floor support structures, abnormal detrusor muscle function, nerve damage related to urination, and surgical trauma [7]. Currently, common treatments such as pelvic floor muscle training, biofeedback electromagnetic stimulation, and pharmacotherapy have long treatment cycles, are costly, and have slow onset, imposing a significant physical and mental burden on patients, affecting daily activities and quality of life. According to related research [8], acupuncture therapy has been proven to be effective in treating SUI, with a variety of options, simple operation, and high safety.

In Traditional Chinese Medicine (TCM), SUI is classified under the categories of "enuresis," "involuntary urination," and "bladder cough." The "Jingyue Quanshu" states, "When the qi collapses and there is no perception of enuresis, it is particularly severe. This is especially common in cases of non-wind conditions and in people with weak qi due to aging or after a serious illness... When the lower burner is exhausted, enuresis occurs." The location of this disease is in the bladder, closely related to the lungs, spleen, kidneys, and triple jiao. The "Suwen" mentions, "The bladder is the official of the capital, where fluids are stored, and qi transformation allows them to be excreted." It further explains that "enuresis is caused by insufficient kidney qi and inadequate bladder qi transformation." The kidney is related to the bladder in the exterior-interior relationship. "The kidney governs water... when the lower burner is cold and cannot warm and regulate water metabolism, involuntary urination occurs." Insufficient kidney qi leads to the loss of bladder qi transformation, resulting in involuntary urination [9]. In syndrome differentiation and point selection, it is essential to consider the entire course of the patient's illness and related treatments. This patient, over seventy years old, already experienced gradual decline in visceral qi and blood. After rectal cancer surgery, the patient's vital qi was damaged, resulting in an unstable lower energyizer. After moving heavy load as an incentive, continued overwork, lost recuperation in daily life, further depleting kidney qi and essence, failing to nourish other organs, and causing dysfunction in warming and regulating water metabolism, leading to long and clear urination due to bladder dysfunction. The root cause of bladder dysfunction and involuntary urination in this case is insufficient kidney qi. Therefore, the patient initially experienced frequent urination and leakage, gradually progressing to incontinence. The occasional back pain reported by the patient reflects the kidney's deficiency, as the back is the residence of the kidney. Thus, the patient was diagnosed with "enuresis due to insufficient kidney qi" in the TCM framework. Tongue and pulse diagnosis supported this categorization, and the treatment principle was to tonify qi, strengthen the kidneys, and consolidate the bladder.

Acupuncture for treating urinary dysfunction has been documented throughout history. The "Lingshu-Diankuang" mentions, "When there is internal closure and inability to urinate, acupuncture should be applied to the foot shaoyin, taiyang, and the sacral region with a long needle." The basic treatment principle for SUI with acupuncture is to tonify kidney qi, assist bladder qi transformation, and achieve the goal of consolidation and urinary retention. This case primarily used acupuncture points from the Bladder and Kidney meridians, including Shenshu (BL23), Pangguangshu (BL28), Ciliao (BL32), Zhonglüshu (BL29), Weizhong (BL54), Fuliu (KI8), and Taixi (KI3). These points belong to the Bladder and Kidney meridians, directly connecting to the viscera, with the therapeutic principle that "where the meridians pass, the treatment reaches." Shenshu and Pangguangshu are back-shu points, where the qi of the viscera converges, and needling them can tonify vital qi, replenish kidney essence, and assist bladder qi transformation. Zhonglüshu, located in the sacral region, directly reaches the affected area, and combined with back-shu points, it can tonify the lower energizer. The "Lingshu" describes Ciliao as "governing both urine and stool," effectively treating urinary system disorders. Needling Ciliao enhances the effect of assisting yang qi transformation and stopping enuresis. Weizhong is a he-sea point and the lower he-sea point of the Bladder meridian, which governs the internal organs. Needling it can regulate the qi of the Bladder meridian, promoting qi transformation and consolidating urine. Taixi is the yuan-source point of the Kidney meridian, where the original qi of the viscera resides, maintaining normal physiological functions of the organs. In cases of organ disorders, source points and back-shu points are often selected together to tonify kidney qi, replenish essence, and control the bladder. Fuliu is a kidney meridian point, with "fu" meaning return and "liu" meaning retention. Based on the mother-son reinforcing and reducing principle, the mother meridian point Fuliu is selected to tonify kidney qi, regulate the triple jiao, and maintain normal water metabolism while assisting bladder qi transformation. Modern research has confirmed that nerve branches of the pudendal nerve, composed of S2-4 nerves, are distributed under the Ciliao point. Needling can stimulate the detrusor muscle and urethral sphincter of the bladder, causing rhythmic contraction and relaxation, thereby improving the storage and voiding functions of the bladder [10-12]. Needling Weizhong can also stimulate the micturition center, inhibiting its reflex arc excitation and reducing overactivity of the bladder. The electroacupuncture used in this case, with low-frequency pulses, also stimulates the pudendal nerve, exercising pelvic floor muscles and alleviating urinary leakage [13].

6. Conclusion

After five sessions of acupuncture treatment, the patient's urine leakage significantly reduced, with almost no leakage at night, suggesting that acupuncture can effectively improve symptoms of SUI following rectal cancer surgery, enhancing the patient's confidence in overcoming the condition. By employing TCM principles of holistic review and syndrome differentiation, ap-

propriate point selection was made to maximize the benefits of acupuncture. However, this report has certain limitations, as it is a single case study lacking validation through randomized clinical trials. In summary, this case indicates that electroacupuncture is highly effective in treating postoperative SUI following rectal tumor surgery, greatly improving symptoms of urine leakage, and gradually reducing leakage with continued treatment, allowing the patient to reintegrate into society. We hope this case provides more treatment options for patients with SUI and offers clinical insights and methods for related treatments.

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