ORIGINAL RESEARCH

Study on Efficacy of Non-cutting Traction Seton Technique on Perianal Abscess

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ABSTRACT

Objective • Investigating the therapeutic effect of the non-cutting traction seton technique on perianal abscess.

Methods • The clinical data of 70 patients with perianal abscesses diagnosed and treated by the Department of Anorectal Surgery of University Affiliated Hospital from January 2020 to December 2021 were collected, and conducted a retrospective study on them, of which 40 cases were treated with non-cut traction seton in the study group, and other 30 cases were treated with perianal abscess incision and drainage in the control group. The perioperative indexes (operation time, intraoperative bleeding volume, time of postoperative dressing change, time of postoperative granulation tissue formation, postoperative defecation-control ability, postoperative pain score, postoperative wound cleanliness) and follow-up indexes (wound healing time, incontinence Wexner score, recurrence rate, patient satisfaction) were compared between these two groups.

Results • The operation time of the study group was more than that of the control group, and the difference was not statistically significant ($P > .05$). The intraoperative bleeding volume, time of postoperative dressing change, time of postoperative granulation tissue formation, the scores on postoperative defecation-control ability, the scores on postoperative wound cleanliness, postoperative complication rate, postoperative pain score, time of wound healing, incontinence Wexner score, and recurrence rate all from the study group were better than those in the control group. The patient satisfaction from the study group was higher than that in the control group, and the above differences were statistically significant ($P < .05$).

Conclusion • Non-cutting traction suture technique has obvious advantages in the treatment of perianal abscess, shortening wound healing time and granulation tissue formation time, reducing intraoperative blood loss and postoperative complication rate, etc. It provides a reference for clinical treatment of perianal abscess. (*Altern Ther Health Med.* 2024;30(7):133-139).

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INTRODUCTION

Perianal abscess is a common anorectal surgical disorder in which infectious lesions appear around the anus, and patients are often presented with local area swelling and pain, continuously increased diameters in phyma, and often accompanied by systemic symptoms such as fever and fatigue.[1,2] Perianal abscesses tend to occur in men around the age of 30; its total incidence rate accounts for 15% of anorectal diseases. Perianal abscesses are primarily caused by bacterial infections from gram-negative bacteria, in which bacteria accumulate and multiply in the crypt and spread to the canal and around the rectum, eventually forming a larger area of infection, leading to the formation of perianal abscesses.[3-5] Perianal abscess often worsens progressively, so timely surgery and drug therapy are critical to controlling infection and preventing deterioration, otherwise the infected area of the perianal abscess will be spread and expanded, and there will be a possibility of developing sepsis, which will ultimately threaten the patient's life.[6,7]

Currently, the main clinical treatment of perianal abscess is incision and drainage, and the suppurative infected area needs to be exposed and disinfected during surgery, so the traditional method mainly relies on open incision and drainage. Perianal abscesses have a relatively urgent onset and rapid progression. Severe patients may experience poisoning, shock, and even death. The surgical incision of abscess for adequate drainage is the mainstay of healing perianal abscesses,[8-11] and if not drained promptly, perianal abscesses may cause systemic infection.[12] The traditional

incision and drainage surgery is more injurious and increases the chance of postoperative infection. The pain is evident during the dressing change after surgery, and the surgical incision takes a long time to heal. Since the anal sphincter is easily destroyed during surgery, some patients will experience short-or-prolonged defecation incontinence.[13] In addition, due to the peculiarities in the area and structure of the anus, the wound may be infected due to frequent friction or the presence of various bacteria in the feces during postoperative defecation, resulting in delayed wound healing, postoperative pain and other adverse consequences, which seriously affect the recovery of the disease and the life quality of the patient.[14] Therefore, it is not only to reduce the damage on normal tissues caused by surgery, but also to ensure sufficient drainage of abscess, which has become the current trend of innovation in perianal abscess surgery.

Our team has found in practice that, for a single abscess, the incision can be narrowed to a fusiform incision, and then drainage tubes on both side of the incision to the bottom of the abscess cavity. For adjacent abscesses For multiple adjacent abscesses, a drainage tube can be used between the abscess cavities to achieve targeted drainage effect; We have collectively named this surgical method as the "non-cutting traction seton technique". In order to verify whether this new surgical method can replace the traditional one, our team compared the perioperative and follow-up indicators of incision and drainage with non-cutting traction seton in the treatment of perianal abscess and explored the clinical value of non-cutting traction seton in patients with perianal abscess.

INFORMATION AND METHODS

Source of Cases

The clinical data of 78 patients with perianal abscess who were diagnosed and treated with surgery in the Department of Rectal Surgery of University Affiliated Hospital from January 2020 to December 2021 were collected for retrospective study. The patients involved in this study or their immediate family members have signed informed consent forms, and this study has been approved by the ethics committee of **University-affiliated hospitals**. The inclusion criteria were: Perianal abscess diagnosed by digital rectal examination and ultrasound; Being at least 18 years old; Having indications for surgery; All of them received one-time incision and radical operation. No hepatitis B, hepatitis C, syphilis and other virus infection. The exclusion criteria were: Crohn's disease;Who are receiving immunosuppressive therapy; who is Accompanied with malignant tumors; who Received pelvic radiation therapy formerly; Being pregnant or lactating;Those with imperfect clinical data or loss of follow-up; Diabetes mellitus, and enteritis, perianal skin disease or rectal cancer and other diseases. According to the above inclusion and exclusion criteria, 70 patients were obtained, and 40 patients were treated with non-cutting traction seton therapy in the study group. Perianal abscess incision and drainage were used in the control group, a total of 30 cases were performed,.A total of 30 follow-up visits were conducted. At 3 months of postoperative follow-up, there was no loss to follow-up in either group, and both were included in this study.

Surgical Methods

Before the operation, a comprehensive examination of all enrolled patients in their blood routine, urine routine, and four coagulation items (PT, APTT, TT, FIB) was carried out to ensure the stability of the patient's indicators and exclude contraindications to surgery. Patients are advised to fast before surgery and to undergo an enema with normal saline before surgery.

The control group was given traditional perianal abscess incision and drainage. After neuraxial anesthesia, the patient takes a lithotomy position with the buttocks closed to the edge of the bed. After the sterile disinfection operation before surgery, a longitudinal or radial incision is made in the lesion site, the skin is cut, the abscess cavity is drained, and the necrotic tissue is removed until the normal tissue is reached beyond the lesion area. Hydrogen peroxide solution is cleaned and disinfected and takes medical gauze tamponade to stop bleeding. Anti-infective therapy is given in the early stage of the postoperative situation, and patients are reminded to wash the local anal area with warm saline twice a day and once after each defecation. Changing the dressing once a day, using the sterile disinfectant solution to wash the wound thoroughly before changing the dressing, using medical cotton balls to remove wound secretions, necrotic tissue, and other foreign matter, removing hyperplastic granulation tissue which higher than the epidermis part, and then covering with sterile gauze, Penicillin was used to fight infection for 5 days postoperation.

The study group was given non-cutting traction seton therapy. After neuraxial anesthesia, the patient takes a lithotomy position with the buttocks closed to the edge of the bed. After the sterile disinfection operation before surgery, a fusiform or radial-shaped incision was made around the lesion site to bluntly separate the abscess cavity, and after using a probe to confirm the lesion at the position of the internal os during the operation, the abscess cavity was incised and exposed in the direction of the probe. A small incision was made at the edge of the abscess leading to the abscess cavity, passed through a drainage tube, and fixed at both ends with a silk ligation outside the abscess cavity, and the same operation was performed on the other side of the abscess. Postoperative management measures were the same as in the control group.

The same group of senior anorectal surgeons performed all surgeries.

Observation Indicators

Perioperative Indicators. It included operation time (min), intraoperative blood loss (ml), postoperative dressing change time (min), postoperative granulation tissue formation time (min), postoperative wound cleanliness

(points) (Table 1), postoperative defecation control ability (points) (Table 2), postoperative pain score (using pain visual simulation score and VAS score), and postoperative complications (including postoperative wound bleeding and urine retention) Edema in retention and operation area).

Follow-up Indicators. The follow-up period was 3 months, and all patients were followed up in the outpatient clinic once a week, and the specific contents of follow-up included: Clinical symptoms;Rectal touch in rectum;Perianal MRI. Follow-up indicators included wound healing time, anal incontinence Wexner score (Table3), recurrence rate, and patient satisfaction. The evaluation content of patient satisfaction includes technical level, surgical efficacy, postoperative pain, service attitude, etc. Evaluation criteria on patient satisfaction index: Excellent: 9-10 points, good: 7-8 points, average: 5-6 points, poor: <5 points. Scores on excellent and good are satisfied among patients; Scores on average and poor are dissatisfied among patients.

Statistical Methods

All data were analyzed by using SPSS 26.0.0 (SPSS, Chicago, IL, USA) statistical software. The measurement data were expressed as mean ± standard deviation, and the continuous data satisfying the normal distribution were tested by independent sample *t* test; Otherwise, the rank sum test will be adopted. Count data were analyzed by chi-square test or Fisher's exact probability. $P < .05$ means the difference is statistically significant.

RESULTS

Comparison of General Data of These Two Groups

There were no statistical differences in gender, age, BMI, health status, smoking history, drinking history, and duration of symptoms between these two groups ($P > .05$), as shown in Table 4.

Comparison of Perioperative Indexes between These Two Groups

The operation time of the study group was more than that of the control group, but the difference was not statistically significant ($P > .05$). The intraoperative bleeding volume in the study group was much smaller than that in the control group, with a statistical difference ($P < .05$), and the incidence of postoperative urinary retention in the study group was lower than that in the control group, but the difference was not statistically significant ($P > .05$). The incidence of postoperative wound hemorrhage and edema in the operative area of the study group was lower than that in the control group, and the difference was statistically significant ($P < .05$). The time of postoperative dressing change, the time of postoperative granulation tissue formation, the score of postoperative defecation-control ability, the score of postoperative wound cleanliness, the postoperative complication rate, and postoperative pain score of the study group were all better than those of the control group, and the differences were statistically significant ($P < .05$) as shown in Table 5.

Table 1. Postoperative Wound Cleanliness (points)

Score	Cleanliness
0	Very clean, with excellent cleanliness
1	A small amount of fecal water remains on the wound surface, and after wiping with hydrogen peroxide gauze, it tends to be clean with good cleanliness
2	A small amount of fecal residue on the wound surface can only be cleaned by repeatedly wiping with hydrogen peroxide gauze, and the cleanliness is average
3	The wound is filled with gauze strips and fecal residue with no traces of flushing, the cleanliness is poor.

Table 2. Postoperative Defecation-control Ability(points)

Scores	Defecation-control situation
0	Both aerofluxus and defecation are controllable, and there is no fecal water or fecal residue flowing out from the anus
1	During aerofluxus , a small amount of fecal water flows out from the anus without any fecal residue flowing out
2	A small amount of fecal residue flows out from the anus during aerofluxus
3	Unconscious and involuntary fecal discharge from the anus

Table 3. Wexner Score for Anal Incontinence (points)

	Never	Rarely (<1 time/ month)	Sometimes (>1 time/month, <1 time/week)	Often (>1 time/week, <1 time/day)	Always (>1 time/ day)	Scores
Dry stool	0	1	2	3	4	10
Loose stool	0	1	2	3	4	10
Gas	0	1	2	3	4	10
Need padding	0	1	2	3	4	10
Life-style modification	0	1	2	3	4	10
Total		5	10	15	20	50

Table 4. Comparison in Clinical Characteristics of these Two Groups

Clinical data	The control group (n = 30)	The study group (n = 40)	*P* Value
Gender (Men:Women)	26:4	35:5	.797
Age (Years) (Mean±SD)	42.5±5.37	43.1±5.28	.642
BMI (kg/m^2) (Mean±SD)	27.0±3.56	25.9±2.92	.328
Health status, n (%)			
Healthy	26(86.7)	32(80.0)	.68
Combined with other diseases	4(13.3)	8(20.0)	
Smoking history, n (%)			
No	23(76.7)	29(72.5)	.693
Yes	7(23.3)	11(27.5)	
Drinking history, n (%)			
No	19(63.3)	24(60.0)	.777
Yes	11(16.7)	16(40)	
Duration of symptoms, n (%)			
≤7 days	28(93.3)	32(80.0)	.218
>7 says	2(6.7)	8(20.0)	

Table 5 Comparison in Perioperative Indicators of These Two Groups

Surgical indicators	The control group (n = 30)	The study group (n = 40)	*P* Value
Duration of Surgery (minutes) (Mean±SD)	24.85±4.01	26.13±4.56	.226
Intraoperative bleeding volume (milliliters) (Mean±SD)	24.38±3.19	17.26±2.83	<.001
Time of postoperative dressing change (minutes) (Mean±SD)	5.12±0.93	3.77±0.82	<.001
Time of postoperative granulation tissue formation (days) (Mean±SD)	5.29±1.04	4.73±0.91	.019
Postoperative pain score (points) median(minimum - maximum)			<.001
The 1st day	5(5-7)	4(3-6)	
The 3rd day	3(3-4)	3(2-3)	
The 5th day	2(1-3)	1(1-2)	
Scale division of postoperative defecation-control ability, n (%)			<.001
0	0(0)	11(27.5)	
1	20(66.7)	28(70.0)	
2	8(26.7)	1(2.5)	
3	2(6.7)	0(0)	
Postoperative wound cleanliness, n (%)			<.001
0	0(0)	24(60.0)	
1	3(10.0)	16(40.0)	
2	24(80.0)	0(0)	
3	3(10.0)	0(0)	
Incidence of postoperative complications, n (%)			
Postoperative wound bleeding	9(30.0)	2(5.0)	.012
Urinary retention	5(16.7)	1(2.5)	.096
Edema in the surgical area	3(10.0)	0(0)	<.001

Figure 1. Comparison of Operative Wounds between these Two Groups (A) Operative the Wound of Control Group; (B) Operative Wound of the Study Group

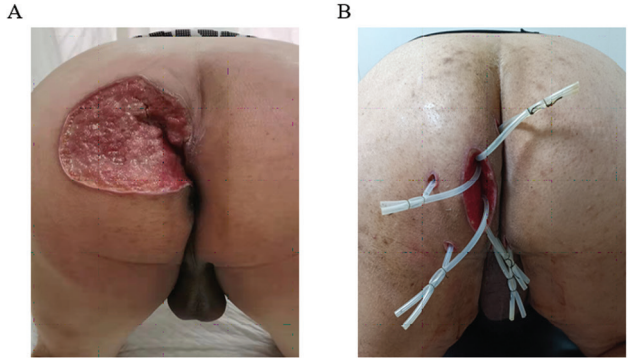

Table. 6 Comparison in Follow-up Indicators of These Two Groups

Follow-up indicators	The control group (n = 30)	The study group (n = 40)	*P* value
Wound healing time (days) (Mean±SD)	52.37±9.84	43.56±7.25	<.001
Recurrence rate, n (%)	6(20.0)	1(2.5)	.044
Patient satisfaction, n (%)	23(76.7)	39(97.5)	.020
Wexner scores	7.20±4.77	2.53±2.94	<.001
Degree of fecal incontinence, n (%)			<.001
Normal	5(16.7)	20(50.0)	
Incontinence in mild degree	16(53.3)	19(47.5)	
Incontinence in moderate degree	9(30.0)	1(2.5)	
Incontinence in complete degree	0(0)	0(0)	

Comparison of Follow-up Indicators between the Two Groups

The wound healing time, Wexner score, and recurrence rate of anal incontinence in the study group were lower than those in the control group, and the patient satisfaction was significantly higher than that in the control group, and the differences were statistically significant ($P < .05$), see Table 6.

DISCUSSION

Etiology and Pathogenesis of Perianal Abscess

In the field of traditional Chinese medicine, "abscess" is "carbuncle", and there are detailed records of "carbuncle" in ancient books from thousands of years ago. Contemporary Chinese medicine practitioners have also carried out a lot of research on perianal abscesses. Traditional Chinese medicine believes that perianal abscesses are mostly due to a fatty diet, causing warmth pathogenic factors in the large intestine, and some scholars believe that their etiology is related to the invasion of external pathogenic factors.[15] Western medicine, on the other hand, believes that bacterial infections cause perianal abscesses, and abscesses are formed due to the accumulation of pus after tissue infection. The pathogenesis of perianal abscess has always been a research hotspot in the clinical medical community. Some scholars have anatomically analyzed that the fecal residue in the area contains a large number of bacteria,. The long-term inappropriate cleaning induces bacterial infection, and a large number of bacteria spread to the anal canal, rectum, and other parts, forming purulent infection nidus; Another scholar analyzed it from the external injury and believed that the skin and mucous membrane near the anus was broken due to trauma, which induced infection, resulting in perianal abscess[16]; Other scholars have analyzed it from the level of hormones, and believe that patients with perianal abscess have hormonal regulation disorders in the body, resulting in dyskeratosis of anal glands, and secretions accumulated around the anus, inducing infection.[17]

Selection on Treatment Modality

There is a lot of fatty tissue around the anus, because the fat tissue is loose, and once the abscess near the anus is formed, it will spread to the surrounding loose tissue, and the spread speed is fast. If the perianal abscess is not controlled in time and continues to worsen, it may lead to systemic infection, necrotizing fasciitis, and other serious consequences.[18,19] It not only aggravates patients' pain but also threatens their lives, increasing the psychological and financial burden of patients and their families. Studies have shown that perianal abscesses are ineffective with antibiotics alone, and the surgical incision and drainage remain the recognized effective treatment.[9,20,21] Some patients undergo simple incision and drainage, and studies suggest that 7~66% of these patients will develop fistulas postoperatively,[22,23] primarily due to incomplete management of the anal recess from perianal abscess origin.[24] To achieve lower recurrence rate and fistula formation after surgery, some surgeons choose to remove the abscess cavity during surgery until normal tissue is present and also manage the anal recess that causes the perianal abscess. Patients who undergo this surgery will have large skin defects, obvious postoperative pain, easily get damage to the sphincter, and affected function, and it will take longer recovery time after surgery to completely heal the wound. The pain of the postoperative incision and the long healing process are painful for the patient, and the higher risk of incontinence will also increase the psychological burden of the patient. Nowadays, medical conditions are constantly improving, and in this context, patients' requirements for surgery are gradually changing to cure the disease and ensure a good life quality. This also spurs medical workers to constantly find more reasonable treatment methods to meet patients' needs, and promotes the development of modern medicine. The concept of modern surgery is to cure diseases through minimally invasive methods for ensuring the life quality of patients.[25] The development of proctology should also follow the advanced concept of minimally invasive surgery.

The principle of the traditional seton technique includes Necrosis through the stranglehold of seton, which plays a chronic cutting role; Through the foreign matter stimulation of the seton, promoting tissue fibrosis and shortening the wound healing time;Using the drainage effect of seton to help the discharge of abscess secretions; Using seton to mark the position of the wound for facilitating dressing change. However, the traditional seton technique results in pain during chronic strangulation, and some patients are unbearable with the pain in this process, and at the same time, it will cause obvious damage to the sphincter, affecting the function of some patients. Parks virtual seton is an improved operation based on

traditional one, which is mainly used to treat highly complex fistula. which promotes the growth of granulation tissue through the stimulation of foreign matter, and greatly reduces the pain of patients by using virtual seton, and the seton avoids the sphincter, thereby protecting function.[26] The non-cutting traction seton technique applied in this article further evolved the existing seton technique.

Characteristics of the Surgical Method

On the basis of incision drainage and seton technique, the non-cutting traction seton technique has been improved and innovated to make up the shortcomings of traditional treatment methods. This surgical method mainly has the following characteristics: Different from the seton in other surgical procedures, the seton does not play a cutting role. That is, it is not cutting. When changing the dressing, the wound surface can be easily exposed by pulling the seton and Cleaning the wound surface, that is, traction seton; The wound surface can be fully exposed, and the number of washing and wiping can be reduced when changing the dressing, thereby greatly reducing the pain of the patient and making the wound cleaning more thorough; Continuous drainage effects can help the abscess cavity to drain completely; Due to the narrowing of the surgical incision, the scar area after healing is reduced, and the skin around the anus is preserved to the maximum extent.

This surgical method not only ensures adequate drainage of the abscess, but also minimizes the trauma caused by surgery, which is fully in line with the minimally invasive anorectal surgery trend.

Advantages of the Surgical Method

Advantages of Non-cutting. Non-cutting surgery methods can reduce the surgical wound, reduce the degree of normal tissue damage, and improve the prognosis of patients, and at the same time, because of the small surgical trauma, the pain of patients is reduced, ensuring a better life quality of life after surgery. In addition, the non-cutting method is different from the chronic cutting of the seton therapy, which is for the protection of the anorectal ring,. the rubber band or silk thread is used to slowly cut the muscle, and the non-cutting method does not have a cutting effect on the tissue.

Advantages of Traction Seton. The traction seton technique brings convenience to the postoperative dressing change, and the wound can be fully exposed by simply dragging the seton during the dressing change; even if it is a deep abscess, the wound can be easily exposed to ensure the cleanliness of the wound. Since the dressing change process is simple, only 1-2 rinses and wipes are needed to thoroughly clean the surgical wound, and the patient's pain is significantly reduced. Generally, 7-10 days after surgery, the wound secretion is significantly reduced, and the wound can be seen to be filled with fresh granulation tissue; at this time, the seton is removed, and after removing the seton, continuing to use normal saline once a day to rinse and change the dressing. During dressing change, it was found that the patient's pain was significantly reduced.

Analysis of Results Perioperative Indicators

Duration of surgery. Prolonged surgery often leads to complications and an increased risk of organ damage, and given its serious impact on the patient's life quality after surgery, prolonged surgery not only affects the safety of surgery but also increases the damage to the patient.[27] Compared with perianal abscess incision and drainage, the non-cutting traction seton technique for treating perianal abscess has no obvious advantage in controlling the duration of surgery. This is because the non-cut traction seton technique requires fixation at both ends of the drainage tube with silk ligation, which increases the surgical operation and prolongs the duration of surgery.

Intraoperative Bleeding Volume. Surgery is an invasive treatment that may damage macrovascular and small vessels during surgery, resulting in bleeding. Blood obscures the doctor's view of the operating area, so the bleeding needs to be stopped promptly. When the intraoperative bleeding volume is too large, it not only increases the difficulty of the operation but also may cause the patient to lose too much blood, be unable to maintain normal blood volume and increase the risk of hemorrhagic shock. Patients may have hematomas due to heavy bleeding after surgery, resulting in infection and so on. Therefore, intraoperative bleeding volume is an important criterion for evaluating surgery's safety and simplicity.[28] The results of this study showed that the non-cutting traction seton technique can effectively reduce the intraoperative bleeding volume, which may be due to the non-cutting traction seton technique can achieve the effect of fully draining the abscess cavity through a fusiform incision, which minimized the wound surface of the patient, so the intraoperative bleeding volume is significantly reduced.

Time of Dressing change after surgery. If the time of postoperative dressing change is too long, the wound will be exposed to the external environment for a long time, the risk of infection will increase, and the dressing change procedures will often cause pain to the patient. Therefore, shortening the time of postoperative dressing change will assist on wound recovery.[29] When our team performed surgery on a patient with anal fistula, it was very difficult to reveal the wound surface during the surgery under anesthesia because of the deep part of the fistula and the patient's own obesity. Because of the advantage of non-cutting seton when pulling the seton during a dressing change, we also adopted the non-cutting traction seton technique for this patient. During postoperative dressing changes, we found that the exposure of the wound is very easy. After the wound is fully exposed, it can be thoroughly cleaned during dressing changes, which is conducive to wound healing.

Time of Postoperative Granulation Tissue Formation. Two factors are critical to accelerating the healing of surgical wounds: the first is that the wound is filled with fresh granulation tissue, and the second is that it has good blood circulation.[30] Since the study group could achieve thorough cleaning with each dressing change after surgery, the probability of wound infection was low, the incidence of

inflammatory reaction was low, and the wound could heal quickly, so the time of granulation tissue formation was earlier than that of the control group.

Postoperative Defecation-control Ability. Surgery inevitably destroys the anatomical and physiological integrity of tissues, so clinicians should take the degree of tissue destruction as an important criterion for surgical safety. Patients with perianal abscess often have decreased postoperative defecation-control ability due to impaired tissue function, which is mainly manifested as increased frequency of bowel movements, more urgent bowel response, and feeling the urge to defecate after defecation. The ability to control defecation is a comprehensive index to measure the ability of reflex and the ability of the sphincter to contract, so the evaluation of postoperative defecation-control ability in patients with perianal abscess can effectively determine the degree of destruction of anal function by different surgical methods.[31,32] Since incision and drainage have greater anatomical trauma on tissues and are more likely to cause damage on nerves in the sphincter and rectum, it has a more serious impact on anal function; At the same time, severe postoperative pain can also affect the patient's ability on controlling defecation. Non-cutting traction seton technique maximizes the protection of the core structure of the anal canal. The main purpose of this surgery is to ensure the efficacy without completely cutting the anal canal, so that the anal function can be effectively protected from damages.

Postoperative Wound Cleanliness. Debridement is beneficial in preventing infection, and keeping the wound clean is key to promoting wound recovery.[33] Its mechanism mainly includes Cleaning up foreign matter on the wound surface to prevent them from causing interference with tissue regeneration; Timely cleaning of exudate can reduce the tension of wound healing; Fully exposing the purulent part, which can effectively improve the drainage effect; Timely removal of harmful substances can prevent them from being absorbed by tissues. This study showed that the degree of postoperative wound cleanliness in the study group was significantly higher than that in the control group.

This may due to the fact that the wound can be completely exposed by pulling the drain fixed during the postoperative dressing change after the non-cutting traction seton treatment, and the wound can be cleaned thoroughly. Therefore, the patients in the study group were able to keep the wound clean at all times during the wound-healing process.

Postoperative Pain Score. The peripheral nerves of anus are abundant, and it is inevitable that some peripheral nerves and capillaries will be destroyed during surgery, so the pain around the postoperative incision is difficult to avoid, and the patient's life quality will be seriously affected.[34] The inevitable process of dressing change and bowel movement are major factors to increased postoperative pain.[14,35] This is because incision and drainage often removes part of the normal tissue to completely remove the abscess cavity, so it increases the surgical wound and the chance of injuring the sphincter. In order to achieve a thorough cleaning effect, the wound needs to be repeatedly disinfected during dressing changes so the patient's pain will be more intense. Non-cutting traction seton surgery is significantly less painful than incision and drainage surgery. Due to the shorter dressing change time and stronger defecation-control ability after non-cutting traction seton surgery, the pain caused by dressing change or defecation after surgery is greatly alleviated.

Postoperative Complication Rate. Surgery is the removal of the pathological or physiological tissues of the body, and the normal tissues around the lesions will be wounded to varying degrees. After tissue damage, capillaries or small arteriovenous rupture, resulting in postoperative wound bleeding. At the same time, the surgical wound is large, there is more tamponade and drainage, and the postoperative foreign matter sensation is obvious, which can easily lead to urinary retention of patients; In addition, postoperative infection and poor blood circulation can also lead to edema in the operative area.[36] Perianal abscess incision and drainage has a large wound range, more damage on surrounding tissues, high risk of infection, easy damage or stimulation of the detrusor muscle of the bladder, and more severe pain in the group receiving incision and drainage, which will increase the probability of postoperative wound bleeding, urinary retention, and edema in the surgical area. In the study group, the surgical injury was small, the time of postoperative dressing change was short, and the pain was mild. Although the incidence of urinary retention did not differ significantly between the study and control groups. Overall, the incidence of postoperative complications was lower in the study group than in the control group.

Analysis of Results Follow-up Indicators

Wound Healing Time. The length of wound healing time is highly correlated with the life quality in patients with perianal abscess. In order to pursue thorough drainage, the incision and drainage will result in larger wounds, more normal tissue will be removed, and the incision will be completely open, which increases the chance of bacterial invasion, and once local inflammation occurs, the healing time will be prolonged. Non-cutting traction can not only reduce the damage to the perianal tissue but also effectively isolate bacteria in the external environment, which is conducive to the growth of the wound, so it can shorten the healing time.

Incontinence Wexner Score. After surgery, some patients with perianal abscess will have incomplete urination and defecation, which increases the difficulty of cleaning, and the long-term residue of perianal excreta increases the possibility of postoperative infection. The higher the Wexner score on incontinence indicates that patients with perianal abscess have a worsen ability to control defecation and urination after surgery. The main factor in postoperative incontinence in patients with perianal abscess is a significant weakness in sphincter function, while non-cutting traction seton surgery has less damage on anus and less impact on sphincter function than perianal abscess incision and drainage.

The Recurrence Rate of Perianal Abscess. Incomplete postoperative debridement leads to repeated bacterial

infections and is a major cause of perianal abscess recurrence.[37] The recurrence rate of perianal abscess in the study group was significantly lower than that in the control group. Since the channel traveled by the fixed drainage tube in non-cutting traction seton surgery makes the abscess cavity connects with the external, and constructs the connection between the abscess cavity and the abscess cavity, ensuring adequate drainage and keeping the postoperative wound clean, the recurrence rate of the study group is lower than that of the control group.

Limitations and Prospects

The results of this study show that the non-cutting traction seton surgery has obvious advantages in improving the perioperative and follow-up indicators of patients with perianal abscess, and it is worthy of clinical promotion. However, this study still has some limitations due to subjective and objective reasons.

Firstly, due to insufficient research funds and time, the overall number of study subjects is small, so the obtained research data may be biased from the real situation. Secondly, since it is difficult for doctors and nurses to guarantee the same professionalism and operational proficiency in the postoperative care process of each patient, and factors related to postoperative index results such as gauze tightness and debridement are difficult to control, this factor will also lead to errors in the study results. In view of the above situation, it is necessary to carry out more clinical studies with larger sample size and reduce external interference factors, such as the different technical levels of medical staff, in order to further verify the conclusions of this study and be more explicit on the advantages and clinical value of non-cutting traction seton surgery compared to traditional incision drainage surgery in patients with perianal abscess.

CONCLUSION

Non-cutting traction seton technique has more obvious advantages in reducing the intraoperative bleeding volume of patients, shortening the wound healing time and the time of granulation tissue formation, improving the ability to control defecation and the cleanliness of the wound, alleviating postoperative pain, and reducing the incidence of postoperative complications.

CONSENT TO PUBLISH

All authors gave final approval of the version to be published.

CONFLICTS OF INTEREST

The authors report no conflict of interest.

AVAILABILITY OF DATA AND MATERIALS

The data supporting this study's findings are available from the corresponding author upon reasonable request.

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Not applicable.

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