

Comparison of curative effect of incision and drainage with cutting seton as well as incision and drainage on ischiorectal abscess and postanal space abscess.

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Abstract

Objective: To compare the curative effect of incision and Drainage with Cutting Seton (IDCS) as well as Incision and Drainage (ID) on ischiorectal abscess and postanal space abscess.

Methods: A total of 81 patients with ischiorectal abscess and postanal space abscess were divided as ID group and IDCS group according to different operation methods, in which there were 42 cases in ID group and 39 cases in IDCS group, the efficacy as well as the levels of serum inflammatory factors (Tumor necrosis factor- α , interleukin-6 and interleukin-8) and oxidative stress (superoxide dismutase and malondialdehyde) were compared between the two groups before and after treatment.

Results: There was no statistically significant difference between IDCS group and ID group in operation time, anorectal pain score at 6 h after operation, the incidence of postoperative urinary retention, postoperative bleeding and postoperative hospitalization days ($P>0.05$); the incidence rate of anal fistula in IDCS group at 3 months after operation was 10.3% (4/39 cases), significantly lower than that in ID group, that was 90.5% (38/42) ($P<0.05$); before operation, there was no significant difference between the two groups in the levels of serum Tumor Necrosis Factor- α (TNF- α), Interleukin-6 (IL -6) and Interleukin-8 (IL -8) ($P>0.05$), while 3 w after operation, the levels of serum TNF- α , IL -6 and IL -8 in IDCS group were significantly lower than those in ID group ($P<0.05$); before operation, there was no significant difference between the two groups in the levels of oxidative stress indexes of serum Superoxide Dismutase (SOD) and Malondialdehyde (MDA) ($P>0.05$), while at 3 w after operation, the level of SOD was significantly higher ($P<0.05$) and MDA level significantly lower ($P<0.05$) in IDCS group than in ID group. **Conclusion:** IDCS is a safe and feasible choice for the treatment of ischiorectal abscess and postanal space abscess with fewer rates of anal fistula and reoperation as well as reduced inflammatory factor level and oxidative stress injury.

Keywords: Ischiorectal abscess, Postanal space abscess, Incision and drainage with cutting seton, Incision and drainage.

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Introduction

Ischiorectal abscess, also known as nest ischial rectal abscess, is a common type of perianorectal abscess, accounting for about 20% [1]. Postanal space abscess is relatively rare. It can extend to the lateral side and enter one or both sides of ischiorectal space, forming posterior horseshoe abscess. The two abscesses are common anorectal diseases in clinical trials, in which patients are suffering from a chronic suppurative infection or acute infection in the soft tissues around anal canal and rectum, which is generally not self-healing with unfavorable efficacy of conservative therapy alone [2,3]. Surgery is the first choice for the treatment of such disease. But different surgical methods lead to varying treatment effects. Incision and Drainage with Cutting Seton (IDCS) and Incision and Drainage (ID) are two different surgical modes for the treatment of ischiorectal abscess and postanal space abscess,

the report on whose efficacy is currently less. Surgical treatment is the most effective means, but the deep abscess cavity will hurt the levator ani muscle, leading to moderately large surgical wound and long recovery time after operation; the mechanism of wound healing is complex in which inflammatory factors are involved, and surgery will bring a series of oxidative stress injury. This study mainly compares the curative effect of IDCS and ID on ischiorectal abscess and postanal space abscess, and observes the influence in the levels of serum inflammatory factors as well as oxidative stress in patients so as to provide reference for the clinical treatment of this disease, with the details now reported as follows.

Data and Methods

General information

Medical records data were collected from 81 patients with ischiorectal abscess and postanal space abscess enrolled in people's Hospital of Yuyao City, Zhejiang from January 1, 2015 to April 30, 2017, who were divided into Incision and Drainage (ID) group as well as Incision and Drainage with Cutting Seton (IDCS) group according to different operation modes; in ID group there were 42 cases, 37 males and 5 females aged 40.81 ± 14.42 y, including 37 ischiorectal abscess cases and 5 postanal space abscess cases while in IDCS group there were 39 cases, 33 males and 6 females aged 43.79 ± 13.61 y, including 34 ischiorectal abscess cases and 5 postanal space abscess cases. The difference in general date between the two groups was not statistically significant ($P > 0.05$), suggestive of a comparability.

Methods

Operation method: Preoperative preparations were conducted in the two groups including routine preoperative blood routine examination and rectal B ultrasound. Patients were treated by enema glycerini (20 ml) enema 30 min before operation with the exhaustion of stool in the rectum. Under epidural anesthesia or general anesthesia, patients were fixed on the surgical bed with jack knife position; the distance between two sides of the hips in patients was increased by using sticky tape with the exposure of surgical field followed by conventional surgery area disinfection, shop sterile surgical towels single, on tourniquet.

Treatment in Incision and Drainage (ID) group: A launch-incision (2 cm long) was conducted on the most fluctuant site of the perianal mass followed by blunt separation of abscess cavity by vessel forceps and the discharge of pus, which was collected for bacteria culture and drug sensitivity test. The purulent cavity was washed alternately with hydrogen peroxide, polyvidone iodine solution and physiological saline with a yarn with polyvidone iodine left through the incision for drainage.

Treatment in IDCS group: (1) In patients with ischiorectal abscess, a launch-incision with the length of 2 cm (point A) was conducted on the most fluctuant site of the perianal mass followed by blunt separation of abscess cavity by vessel forceps and the discharge of pus, which was collected for bacteria culture and drug sensitivity test. The internal opening (point B) was located in the corresponding anus recess, the skin of anus between the points A and B was incised with electrotome followed by electrical cauterization for destroy of internal opening. The purulent cavity was flushed with hydrogen peroxide, povidone iodine solution and physiological saline followed by cutting seton drainage through the two points. (2) in patients with postanal space abscess: a launch-incision with the length of 2 cm (point A) was conducted on the most fluctuant site of the anus posterior perianal mass, followed by incision of the skin and subcutaneous tissue,

longitudinal incision of partes superficialis of muscoli sphincter ani externus into ischiorectal space, blunt separation of abscess cavity by vessel forceps as well as the discharge of pus, which was collected for bacteria culture and drug sensitivity test. If the pus cavity extended to the anal left or/and right posterior position, patients were incised on corresponding crissum region to form alar lining, and abscess fluid was drained away in perianal skin and subcutaneous tissue; the internal opening (B point) was located at the corresponding posterior abscess position, and the skin of anus between the points A and B was incised with electrotome followed by electrical cauterization for destroy of internal opening. The purulent cavity was flushed with hydrogen peroxide, povidone iodine solution and physiological saline followed by cutting seton drainage through the two points.

Perioperative management

After operation, patients were given cefodizime sodium (2 g) injection, IVGTT and bid anti-infection treatment, with warm sitz bath three times a day and 20 min/per time. The wound were treated by dressing changes and patients were discharged 2-4 d after the operation. The patients in ID group were reexamined every 2~4 w after discharge, and were given out-patient follow-up review respectively at 3 months after operation and at 6 months after operation. In DCS group, the cutting seton was tightened until dropping during out-patient review once every 1~2 w after discharge and patients were also given review respectively at 3 months after operation and at 6 months after operation.

Observation index and evaluation of curative effect

The operation time of the two groups was recorded; the anorectal pain at 6 h after operation was assessed by Visual Analogue Scale (VAS) score; the cases with postoperative urinary retention, the cases with postoperative hemorrhage, postoperative hospital stay and the anal fistula cases at 3 months after operation were recorded respectively. Fasting peripheral venous blood was collected from patients respectively before and after operation as well as 3 w after operation to detect the levels of inflammatory factors and oxidative stress, in which the former included Tumor Necrosis Factor (TNF- α), Interleukin-6 (IL-6) as well as Interleukin-8 (IL-8) and the latter Superoxide Dismutase (SOD) as well as Malondialdehyde (MDA). The levels of TNF- α , IL-6 and IL-8 were determined by double-antibody sandwich enzyme-linked immunoassay method with the kit provided by Beijing Jing Mei Biological Engineering Co., Ltd. SOD was detected by radioimmunoassay with the kit provided by Shenzhen Jing Mei Biological Engineering Co., Ltd., MDA was detected by thiobarbituric acid method with the kit provided by Shanghai Ji Ning Biological Technology Co., Ltd., and all operation was carried out strictly according to the kit instructions.

Detailed steps for ELISA are as follows: the specific antibody is attached to the solid support to form a solid phase antibody. Then, test specimens are added to make contact with the solid phase antibody and react for a period of time, so that the

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antigen in the specimen can bind to the solid phase carrier antibody to form a solid phase antigen complex. Next, the antigen on the solid phase immune complexes combines with enzyme-labeled antibody. The amount of enzyme present on the solid support at this point is positively correlated with the amount of substance being tested in the sample. Finally, enzymes in a sandwich complex catalyse substrate to become a colored product. The qualitative or quantitative determination of the antigen is based on the degree of color reaction.

Statistical method

The data were analysed on SPSS 21 software, the measured data were expressed as mean ± standard deviation and assessed by t-test, and the count data were analysed by χ^2 test. P<0.05 suggested that there was statistically significant difference.

Table 1. Comparison of operation time and postoperative pain score between the two groups.

Group	Case	Operation time (min)	Postoperative urinary retention (case)	Postoperative bleeding (case)	Anorectal pain score at 6 h after operation	Anal fistula at 3 months after operation (case)	Postoperative hospitalization days (d)
ID group	42	19.67 ± 6.47	2	3	2.83 ± 0.73	38	3.24 ± 1.23
IDCS group	39	26.95 ± 11.55	2	2	3.03 ± 0.90	4	3.44 ± 1.17
t/ χ^2		1.342	0.975	0.653	0.293	9.559	0.164
P		>0.05	>0.05	>0.05	>0.05	<0.05	>0.05

Comparison of levels of serum inflammatory factors between the two groups

Before operation, there was no significant difference between the two groups in the levels of serum TNF- α , IL-6 and IL -8

Table 2. Comparison of levels of serum inflammatory factors between the two groups.

Group	n	TNF- α (ng/L)		IL-6/(ng/L)		IL-8/(μ g/L)	
		Before operation	3 w after operation	Before operation	3 w after operation	Before operation	3 w after operation
ID group	42	194.5 ± 23.6	132.6 ± 13.5	165.8 ± 34.2	119.6 ± 15.7	0.95 ± 0.12	0.57 ± 0.09
IDCS group	39	194.2 ± 21.7	104.8 ± 9.6	165.2 ± 31.7	91.5 ± 4.6	0.94 ± 0.11	0.32 ± 0.08
t		0.177	5.093	0.415	5.941	0.396	6.118
p		>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Comparison of levels of serum oxidative stress between the two groups

Before operation, there was no significant difference between the two groups in the levels of oxidative stress indexes of

Table 3. Comparison of levels of serum oxidative stress between the two groups.

Group	n	SOD/(U/ml)		MDA/(nmol/ml)	
		Before operation	3 w after operation	Before operation	3 w after operation
ID group	42	76.8 ± 7.4	115.7 ± 16.8	7.39 ± 0.57	6.04 ± 0.41

Results

Comparison of relevant indexes between the two groups

There was no statistically significant difference between IDCS group and ID group in operation time, anorectal pain score at 6 h after operation, the incidence of postoperative urinary retention, postoperative bleeding and postoperative hospitalization days (P>0.05); the incidence rate of anal fistula in IDCS group at 3 months after operation was 10.3% (4/39 cases), significantly lower than that in ID group, that was 90.5% (38/42) (P<0.05), as shown in Table 1.

(P>0.05), but 3 w after operation, the levels of serum TNF- α , IL -6 and IL-8 in IDCS group were significantly lower than those in ID group (P<0.05), as shown in Table 2.

serum SOD and MDA (P>0.05), while at 3 w after operation, the level of SOD was significantly higher (P<0.05) and MDA level significantly lower (P<0.05) in IDCS group than in ID group, as shown in Table 3.

IDCS group	39	76.3 ± 7.6	139.7 ± 17.3	7.38 ± 0.61	4.03 ± 0.52
T		0.296	6.104	0.255	7.059
P		>0.05	<0.05	>0.05	<0.05

Summary

There was no statistically significant difference between IDCS group and ID group in operation time, anorectal pain score at 6 h after operation, the incidence of postoperative urinary retention, postoperative bleeding and postoperative hospitalization days ($P>0.05$); the incidence rate of anal fistula in IDCS group at 3 months after operation was 10.3% (4/39 cases), significantly lower than that in ID group, that was 90.5% (38/42) ($P<0.05$); before operation, there was no significant difference between the two groups in the levels of serum TNF- α , IL-6 and IL-8 ($P>0.05$), while at 3 w after operation, the levels of serum TNF- α , IL-6 and IL-8 in IDCS group were significantly lower than those in ID group ($P<0.05$); before operation, there was no significant difference between the two groups in the levels of oxidative stress indexes of serum SOD and MDA ($P>0.05$), while at 3 w after operation, the level of SOD was significantly higher ($P<0.05$) and MDA level significantly lower ($P<0.05$) in IDCS group than in ID group. These results suggest that IDCS is a safe and feasible choice for the treatment of ischiorectal abscess and postanal space abscess with fewer rates of anal fistula and reoperation as well as reduced inflammatory factor level and oxidative stress injury.

Discussion

Perianal and perirectal abscess is mainly treated by incision and drainage at present [3-5] and its treatment mainly focuses on how to reduce postoperative recurrence rate and anal fistula rate, avoid function damage of anus and prevent fecal incontinence. It is traditionally held that perianal and perirectal abscess is in an acute, infectious and inflammatory state. Under such circumstance, surgery will cause moderately large injuries of tissue and it is difficult to locate internal opening and protect the anal function, failing to be cured once and for all. Ischiorectal abscess and postanal space abscess, the two types of perianal and perirectal abscesses, usually treated also by incision and drainage followed by a second procedure of fistula surgery. It has been recently reported that [6-9] incision and drainage with cutting seton can prevent the formation of anal fistula so as to avoid secondary anal fistula operation and its corresponding risk. The treatment is desired in the principle that [10] perianal and perirectal abscesses and anal fistula occur at different periods of one disease, in the abscess incision and drainage for inflammation resolution, the cutting seton between abscess mouth and pus cavity is equivalent to a ligating method for treating anal fistula. However, there are still some disputes. And the arguments focus on which has better efficacy and safety, one-stage operation or two-stage operation?

The author of this study thinks that perianal abscess can usually be easily cured by incision and drainage or direct

incision because of its superficial location, while the levator ani muscle abscess (such as pelvirectal abscess and high intramuscular abscess), is located at moderately high site with few clinical cases and difficult diagnosis, to which the treatment of IDCS may not apply. As a result, cases of perianal abscess and levator ani muscle abscess were not included in this study.

In the study, the curative effect of IDCS and ID on ischiorectal abscess and postanal space abscess was mainly compared and the results showed that: there was no statistically significant difference between IDCS group and ID group in operation time, anorectal pain score at 6 hours after operation, the incidence of postoperative urinary retention, postoperative bleeding and postoperative hospitalization days ($P>0.05$); and the incidence rate of anal fistula in IDCS group at 3 months after operation was 10.3% (4/39 cases), significantly lower than that in ID group, that was 90.5% (38/42) ($P<0.05$). Therefore, it is believed that IDCS is safe and feasible for the treatment of ischiorectal abscess and postanal space abscess. Compared with ID treatment, IDCS is more complicated in operating procedures and need repeated follow-up after operation for falling of cutting seton, however, it avoids the two-stage anal fistula operation, thus achieving satisfactory effects on the whole.

NF- α , IL-6 and IL-8 are important inflammatory factors in serum [11,12]. SOD and MDA are respectively lipid peroxide and important antioxidative enzyme in the body in which the former can indirectly reflect the degree of lipid peroxidation as well as tissue damage according to its level change, and the latter plays an important role in the balance of oxidation and antioxidation [13]. When SOD decreases and MDA rises, lipid peroxidation is generally believed to be present in the body, resulting in oxidative stress [14,15]. The results of this study showed that at 3 w after operation, the levels of serum TNF- α , IL-6 and IL-8 in IDCS group were significantly lower than those in ID group; and SOD was significantly higher ($P<0.05$) as well as MDA significantly lower in IDCS group. These suggested that IDCS therapy can effectively reduce inflammatory response and oxidative stress.

However, we have also found some shortcomings of IDCS treatment. For example, it has complex operating and requires much attention in the course of surgery. The key to the IDCS treatment for ischiorectal abscess and postanal space abscess is the accurate localization of internal opening. Hanley [6] and his colleagues have a similar view. According to the Goodsall rule and with reference to preoperative B ultrasound as well as examination under anesthesia, we have made a careful pancreatic exploration on abscess location, trend and opening of infection. For those with unidentified abscess location, we do not reluctantly carry out the treatment of incision and

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drainage with cutting seton, and directly take the traditional drainage method instead. If we keep on exploring blindly and seek out a false internal opening, patients may suffer from abscess recurrence and even complex anal fistula after operation, thus increasing the difficulty of reoperation.

To sum up, IDCS is a safe and feasible choice for the treatment of ischiorectal abscess and postanal space abscess with fewer rates of anal fistula and reoperation as well as reduced inflammatory factor level and oxidative stress injury.

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