



The Negative Pressure Therapy in the Treatment of Patients with High and/or Complex Recurrent Anal Trans-Sphincteric Fistulas: Retrospective Analysis of Six Clinical Cases

Przemyslaw Ciesielski^{1,2*}, Piotr Diuwe¹, Malgorzata Kolodziejczak², Tomasz Banasiewicz³

¹Department of General Surgery, Hospital of Matki Bozej Nieustajacej Pomocy in Wolomin, Poland

²Warsaw Proctology Centre, St. Elzbieta Hospital in Warsaw, Poland

³Department of General Surgery, Endocrinological and Gastroenterological Surgery, Clinical Hospital of H. Swiecickiego UM in Poznan, Poland

Abstract

Treatment of high and complex anal fistulas is difficult and associated with a high risk of recurrence or postoperative sphincter dysfunction. The search for new solutions is aimed at improving treatment results. Negative Pressure Therapy (NPT) is now more widely used in surgery with good effect, especially in the case of difficult to heal profusely discharging wounds and in the case of wounds characterised by difficult, for anatomical reasons, outflow of purulent contents. Some patients with high and complex anal fistulas meet the eligibility criteria for using negative pressure dressing, in addition, the use of negative pressure dressings is not associated with therapy-related risk of incontinence worsening. The authors present their own observations from the treatment of 6 patients with high complex anal fistulas undergoing NPT.

Keywords: Complex anal fistula; Negative wound pressure therapy; Sphincter-sparing treatment

Objective of the Work

Retrospective evaluation of treatment results of high and complex recurrent anal fistulas using negative pressure therapy.

Introduction

Treatment of high and complex anal fistulas is often multi-stage and is associated with a long recovery period, not always followed by a full recovery. In the treatment of high trans-sphincteric fistulas, there is a correlation between completely resection and the risk of anal sphincter injury, and thus the risk of postoperative faecal incontinence. This is one of the most serious proctological complications leading to the search for sphincter-sparing treatments. Negative pressure therapy is one such method. Positive reports of such treatment have been reported in cases of anastomotic leak after Total Mesorectal Excision (TME) surgery [1-3]. Negative pressure therapy is also successfully used to treat chronic as well as infected surgical wounds. The use of continuous negative pressure allows for permanent drainage of accumulated content, purification and reduction of infection. It stimulates healing processes leading to significant reduction or complete closing of leaks or tissue defects.

It should be thought that the use of negative pressure therapy in the treatment of anal fistulas, which are chronic inflammation, can also positively affect their closure, reducing inflammation and changing the unfavorable pressure distribution in the fistula canal, which is undoubtedly one of the reasons for the fistula not to heal.

Material and Method

The material consisted of 6 patients with high and/or complex recurrent anal fistulas (M-2, K-4 aged 26 to 62 years, of average age 42 years). All patients had Trans rectal ultrasound prior to surgery confirming the presence of high and/or complex anal fistula and were previously unsuccessfully operated at least once for this reason (the average number of operations was 2, 5).

OPEN ACCESS

*Correspondence:

Przemyslaw Ciesielski, Department of General Surgery, Hospital of Matki Bozej Nieustajacej Pomocy in Wolomin, 05-200 Wolomin, Poland, Tel: +48607575416; +48227633119; Fax: +48227633344; E-mail: drprzemyslawciesielski@gmail.com

Received Date: 23 Feb 2021

Accepted Date: 02 Apr 2021

Published Date: 07 Apr 2021

Citation:

Ciesielski P, Diuwe P, Kolodziejczak M, Banasiewicz T. The Negative Pressure Therapy in the Treatment of Patients with High and/or Complex Recurrent Anal Trans-Sphincteric Fistulas: Retrospective Analysis of Six Clinical Cases. *Clin Surg.* 2021; 6: 3128.

Copyright © 2021 Przemyslaw Ciesielski. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The analyzed group was divided into 3 groups taking into account the morphological features of the fistula (including the presence or absence of internal and external openings) described in the trans rectal ultrasound examination on:

1. Patients high fistulas without internal opening.
2. Patients with complete high fistulas with a single internal and external opening.
3. Patients with complete high fistulas with a single internal opening and several external openings.

All patients after qualifying for surgical treatment were prepared in a typical way - with enemas, standard antibiotic (cafazoline with metronidazole) and anti-thrombotic prophylaxis were used. The patients underwent the following treatments:

In group 1 - excision of the external opening, curettage of the fistula canal, vacuum drainage of the canal using a Redon drain with a polyurethane sponge.

In group 2 - excision of the external opening, curettage of the fistula canal, vacuum drainage of the canal using a Redon drain with a polyurethane sponge, through the fistula tract to the height of the internal opening; sewing the internal orifice.

In group 3 - excision of external opening along with branches of the main canal, vacuum drainage of the uppermost canal with a polyurethane sponge or supplementary gauze, simultaneous Hippocrates' drainage procedure of trans-sphincteric fistula tract with a loose Seton fistula. Gauze was used instead of a sponge for one patient. In the operator's opinion, it better complemented the deep and narrow spaces requiring effective vacuum drainage in this case.

Further proceedings in all groups were the same. The wounds in external opening were sealed with stoma paste and a special adhesive film, gluing the place through which the sponge and/or drainage was placed (Vivano[®] by Hartman or V.A.C.ULTA[™] by KCI), (Figure 1). Negative pressure was applied in the range from -120 to -90 mmHg. Lower values were adopted for wounds with direct contact with the sphincter and or rectal wall, significant inflammation and endangered tissue. Higher pressure values were used for larger or profusely secreting wounds. The dressing was changed every 2 to 3 days or in the case of earlier unsealing. Each time the dressing was changed in

the operating theatre under nerve block anesthesia or intravenous anesthesia. Each patient underwent 3 to 5 dressing changes (minimum therapy time 7 days, maximum 19 days, average 13 days). With each subsequent change, the volume of the sponge or gauze filling the tissue defect was gradually reduced and the position of the drain was reduced. During the applied dressing, the patient could move and sit taking care only to maintain tightness of the dressing. After the specific training of the patient and his family in regards to dressing proceedings, the patients were referred to continue treatment at home using portable devices for NPT. Avelle[™] system from ConvaTec was used with hydrofiber dressing for all patients. The dressing was applied without stoma paste directly to the wound placed on the external opening. Patients changed their dressings at home daily for the next 5 days. In all patients, the dressing was unsealed within 1 day and required a daily change. In investigators opinion this period of treatment was disappointing and did not meet our expectations due to anatomical difficulties with applying the dressing.

Each patient underwent control Tran's rectal ultrasound (the minimum time from surgery to control Trans rectal ultrasound was 2 months and the maximum was 6 months). The results of preoperative and postoperative tests were compared and the following parameters were assessed in the control study:

- a. The presence or absence of a fistula canal.
- b. The presence or absence of an internal fistula opening.
- c. The presence or absence of an external fistula opening.
- d. Location of the fistula canal relative to anal sphincters - estimated muscle mass covered by the fistula.

Results

The obtained results are presented in the form of Table 1.

Post-treatment follow-up examinations did not show improvement in terms of features: The existence of a fistula, its internal and external openings, and the mass of the fistula muscle. Groups 1 and 2 did not change before and after treatment. The change was observed only in the 3-treatment group in which complete fistulas with multiple external openings were simplified. Branch excision and wound drainage together with Hippocrates' procedure in one case led to healing of all backflows, leaving only the fistula canal sewn in to the

Table 1: Comparison of TR USG results before and after treatment with negative pressure dressings.

	fistula features/groups	group 1		group 2		group 3	
		A-S	M-B	S-L	L-W	K-K	J-S
TR USG Control before treatment	patient initials						
	fistula canal	yes	yes	yes	yes	yes	yes
	external outlet	yes	yes	yes	no	yes	no data
	internal outlet	no	no	yes	yes	yes	no data
	muscle %	100%	50%	50%	30%	30%	no data
	tanks/branches	yes	yes	no	yes	yes	yes
TR USG control after treatment	patient initials						
	fistula canal	yes	yes	yes	yes	yes	yes
	external outlet	yes	yes	yes	yes	yes	yes
	internal outlet	no	no	yes	yes	yes	yes
	muscle %	100%	50%	50%	30%	30%	no data
	tanks/branches	yes	yes	no	yes	no	no



Figure 1: NPT in anal fistula treatment.

drainage tube, while in the other it significantly reduced the fistula by facilitating the next stage of treatment.

The average length of time a patient was in the hospital was 12.8 days (from 7 to 19 days). The number of used dressings per patient was on average 4 dressings, not counting the portable NPT set, which the patient was required to obtain before leaving home.

Discussion

Negative pressure treatment seems to be strongly justified in patients with complex anal fistulas. Abundant fistula secretion, inflammatory infiltration, numerous canals difficult to drain located in spaces separated by muscles limiting their drainage are indications for the use of this method. The possibility of using sphincter-sparing therapy also adds to the value of this method.

During the treatment used, gradual appearance of granulation tissue in the wound, reduction of fistula discharge, reduction of inflammatory infiltration, as well as shallowing of the fistula canal were observed. It also allowed drainage of high-lying tanks and backflows.

On the other hand, however, it is important to emphasise the extremely difficult anatomical conditions to establish and properly maintain effective suction drainage in this area. The presence of anus with secretions, numerous bends and skin folds make it difficult to maintain a tight drainage for a long time. The use of a special adhesive film and stoma paste around the wound significantly improved the tightness of the dressing. In addition, proper education and cooperation with the patient were necessary to ensure that the correctly applied dressing maintains tightness.

There are reports in the literature about the effective use of VAC therapy in the case of high complete fistulas. Most of these reports, similar to ours, are based on very few patient groups. Researchers from Germany presented a group of 7 patients whose treatment had a good short-term effect [4]. Researchers did not observe complications during or after treatment. A small group of patients despite a multicentre study in Germany indicates technical difficulties resulting from the essence of therapy. We believe that difficulties in establishing and maintaining a sucked dressing is an important

element affecting the choice of method, because leaving the drainage unsealed often not only does not bring benefits, but can lead to the retention of purulent content and widen the infection.

The rich vascularization and innervation of the perineum requires that the dressings are always applied in the operating theatre with adequate anaesthesia. The patient should stay in the hospital during the entire therapy, and this significantly extends the period of postoperative treatment by and increases costs. The lack of an adequate valuation of this procedure by the NFZ (National Health Care) makes preparation and management of patients treated with negative pressure dressings very time and cost consuming.

The advantage highlighted by German researchers is the sparing nature of the method [4]. The extensive wounds of the anal area are avoided and, above all, the risk of anal sphincter injury, and thus postoperative faecal incontinence, the most serious of complications of anal fistula surgery, is minimized.

In the described cases, it appears that only in complex, branched anal fistulas, negative pressure dressings combined with the excision of a significant part of branches resulted in clinically significant improvement for the patient. A similar technique of combining negative pressure dressings with the excision of numerous branches was used by the authors of the Polish publication from 2015 [5]. The described procedure allows limiting the disease to a single fistula tract controlled by loose seton drainage.

The authors believe that negative pressure therapy is a helpful method in simplifying the course of the fistula, its shallowing, reduction of leaks and branches, and reduction of inflammatory infiltration. Works well, also in the case of fistulas with high purulent content tanks and inflammatory infiltration in the perianal space. It allows you to reduce exudate and reduce infiltration, as well as initiate the granulation process and clean the wound. It can therefore be a very helpful introduction before the next stage of treatment, which, however, requires confirmation in randomised studies in larger groups of patients. However, none of the patients studied by us managed to fully heal the fistula. After initial significant improvement in the appearance of the wound and the appearance of granulation tissue and shallow wounds, control trans rectal ultrasound examinations did not confirm the expected changes and showed the presence of the canal, outlets and muscle mass under the fistula to the same extent as before surgery.

To sum up the conclusions of the discussion, VAC therapy in the treatment of anal fistula has many limitations. Prolonged stay of patients in the medical ward, high costs associated with the use of specialized dressings and the need to change them in operating theatre conditions, the need for anaesthesia when changing dressings, involvement of operating theatre staff and anesthesiologists significantly increase the cost of treatment. Failure to include these costs in the Polish NFZ (National Health Fund) valuation does not encourage the extensive use of negative pressure therapy in a patient with anal fistula in a Polish hospital.

Conclusions

1. No improvement after negative pressure treatment was observed in patients with complete and internally blind rectal fistulas.
2. Partial improvement was observed in the group of patients with high, complete fistulas with numerous external openings and branching.

3. The applied treatment with negative pressure therapy is time and cost consuming.

4. The analysis is of a pilot nature, it concerned only 6 patients, observations require confirmation on a larger group of patients.

Authors' Contribution

All authors listed above have contributed substantially to the design, performance, analysis, or reporting of the work. The manuscript has been approved by all authors and has not been submitted elsewhere for publication.

P. Ciesielski and P. Diuwe designed the study, performed the statistics, interpreted the data, and have written the manuscript. M. Kolodziejczak and T. Banasiewicz participated in data interpretation and editing of the manuscript.

References

1. Bemelman WA. Vacuum assisted closure in coloproctology. *Tech Coloproctol.* 2009;13(4):261-3.
2. Weidenhagen R, Gruetzner KU, Wiecken T, Spelsberg F, Jauch KW. Endoscopic vacuum-assisted closure of anastomotic leakage following anterior resection of the rectum: a new method. *Surg Endosc.* 2008;22(8):1818-25.
3. Chorti A, Stavrou G, Stelmach V, Tsaousi G, Michalopoulos A, Papavramidis TS, et al. Endoscopic repair of anastomotic leakage after low anterior resection for rectal cancer: A systematic review. *Asian J Endosc Surg.* 2019;13(2):141-6.
4. Schniewind B, Schafmayer C, von Schönfels W, Heits NG, Kucharzik T, Klein G, et al. Treatment of complicated anal fistula by an endofistular polyurethane-sponge vacuum therapy: A pilot study. *Dis Colon Rectum.* 2018;61(12):1435-41.
5. Banasiewicz T1, Hermann J, Krokowicz L, Drews M. "Sandwich technique" with bridging, a modification of negative pressure wound therapy for anal fistulas. *Tech Coloproctol.* 2015;19(3):173-5.