

The Role of Fibrin Glue in the Treatment of High and Low Fistulas in Ano

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ABSTRACT

Aim: The aim of this study was to assess the outcome of fibrin glue in high and low anal fistulas.

Methods: A prospective, non-randomized trial was carried out on 30 patients who were diagnosed to have fistulas in ano. They were evaluated by categorizing them into high (with the internal opening above the anorectal ring)(14/30) and low anal fistulas (with the internal opening below the anorectal ring) (16/30). The fibrin glue was instilled in their anal tracts. The character of the anal tract, whether it was single or multiple and primary or recurrent, was analyzed. The outcome in terms of a postoperative discharge (failure), the incidence of a postoperative perianal pain/abscess and the glue reaction, was noted at 1 week, 1 month, 3 months and 6 months. A success was defined as the absence of any discharge at 6 months.

Results: Fourteen patients with high anal fistulas and 16 with low anal fistulas (with a mean age of 48.5yrs) were treated

with fibrin glue. 19 patients had primary tracts (7- high group and 12- low group) and 11 had recurrent tracts (7- high group and 4- low group). 20 fistulas were single tracted (8- high and 12- low) and ten were multiple tracted (6- high and 4-low). The success rate at 6 months was 57.14% in the high group and it was 81.25% in the low group. The failure rate was 85.71% in the recurrent high fistula group as compared to 25% in the recurrent low fistula group ($p=0.049$). 25% of the single tracted high fistulas failed to heal as compared to a 100% healing rate in the single low fistulas group ($p=0.90$).

Conclusion: This procedure is thus, superior to the conventional surgical treatment, in terms of the patient comfort, an undisturbed sphincter function, a reduced overall hospital stay, wound pain and the complications and adverse reactions. It showed the best results in the primary, single tracted and the low anal fistulas.

Key Words: Fistula in ano, Fibrin glue, Failed fistula, Recurrent fistula

INTRODUCTION

A fistula in ano is a common perianal condition that is associated with appreciable morbidity and inconvenience to the patient. Fistulotomy, fistulectomy and seton insertion are the most commonly performed surgical procedures for this condition. These surgical modalities have low rates of efficacy, a prolonged postoperative wound healing and protracted pain.

Over the past decade, fibrin glue treatment of anal fistulas has become increasingly popular. Fibrin glue is a biological glue which is made of fibrinogen and thrombin along with other clotting factors (Aprotinin factor 13 and Ca), which when combined, lead to the last step of the clotting mechanism, thus forming a gel like clot [1,2]. This glue offers a unique treatment modality by sparing the sphincter muscles and thus preventing incontinence. It also decreases the patient discomfort and loss of the job hours. It is simple and repeatable and a failure does not compromise the further treatment options [3]. Though fibrin glue is increasingly used in the treatment of anal fistulas, it is yet to establish its long-term efficacy and to clarify its role in this setting. Our study was aimed at determining the role of biological fibrin glue in the treatment of high and low fistulas in ano, as well as primary and secondary fistulas and at analyzing the outcome measures in terms of the pain, perianal swelling, discharge, faecal or gas incontinence and the recurrence in 30 patients, which has not been published before as a single study group.

MATERIALS AND METHODS

This study was conducted over a period of one and half years (December 2007 to June 2009). 30 patients with fistulas in ano, after getting their informed consents, were included in the study. The exclusion criteria included HIV positive patients, patients who were not willing to undergo this treatment and those with rectovaginal fistulas, fistulas which were associated with chronic cavities and acute sepsis.

The patients were categorized into the high and low anal fistula groups. All the patients were inspected per rectally to look for the external opening, which was palpated digitally to feel for the internal opening pit/induration and the anal tract and to check whether it extended till or above the anorectal ring. A per rectal examination, anoscopy and a digital examination could diagnose all the low anal fistulas (the internal opening below the anorectal ring). The diagnosis of the high anal fistulas was made, based on a digital examination, when the tract extended above the anorectal ring and on fistulography, when the contrast enhanced internal ring was seen in the rectum. Fistulograms were done in all patients to look for any cavities and the number of tracts (single or multiple) in a fistula.

MRI could be done only for few [4] of the already operated fistulas. Because of the higher cost and poor affordability, MRI could not be done in all the patients. These methods could also categorize the patients into single tracted or multiple tracted.

The patients who had taken no treatment for their symptoms of fistula were considered as primary and those who had failed the previous operative treatment were grouped as recurrent. No mechanical bowel preparation was done.

Under spinal anaesthesia, the lithotomy/prone jack knife external opening and the internal opening of the anal tract were identified. The fistula tract was curetted and irrigated with normal saline and both the components of the fibrin glue were siphoned into the tuberculin syringes. They were connected to a dual chamber applicator and the tips were injected into the tract opening. The two components were then injected simultaneously into the external opening until the fibrin glue came out from the internal opening. A petroleum jelly gauze was then applied over the external opening and the patients were sent home on a normal diet and on oral antibiotics for 5 days.

The patients were followed up during the postoperative period in the first week and at one month, three months and six months, in the out patients department and the outcomes like pain, discharge, swelling and faecal or gas incontinence were analyzed. The data which was so obtained, was statistically analyzed by using the Chi Square and the "Z" tests. The correlation of the various outcomes in the high and low groups were studied. The p – values were calculated.

RESULTS

Thirty patients, 14 with high anal fistulas and 16 with low anal fistulas (with a mean age of 48.5 years and a male to female ratio of 26: 4) were included in the study. Nineteen patients had primary tracts (7 in the high group and 12 in the low group) and eleven had recurrent tracts (7 in the high group and 4 in the low group) [Table/Fig-1]. Twenty fistulas were single tracted (8 in the high group and 12 in the low group) and ten were multiple tracted (6 in the high group and 4 in the low group) [Table/Fig-2]. A failure or recurrence was defined as a persistence or reappearance of the discharge through the fistula or the development of a perianal abscess. A successful treatment was defined as the absence of any discharge or abscess till the time of the last follow up.

In the high group, 7 out of the 14 fistulas were successfully healed after the first attempt. The unhealed tracts were reglued, which healed only 1 out of 7 patients. The success rate, by the end of

Type (n=30)	Primary	Secondary
High (n=14)	7 (50%)	7 (50%)
Low (n=16)	12(75%)	4 (25%)

[Table/Fig-1]: Division on basis of High-Low, Primary-Secondary Fistulas

Type (n=30)	Single	Multiple
High (n=14)	8 (57.1%)	6 (42.8%)
Low (n=16)	12 (75%)	4 (25%)

[Table/Fig-2]: Division on basis of High-Low, Single-Multiple Fistulas

Type (n=30)	Success after Primary Treatment	Reglue Rate	Overall Success after 6 months
High (n=14)	7/14 (50%)	1/7	8/14 (57%)
Low (n=16)	13/16 (81%)	0/3	13/16 (81%)

[Table/Fig-3]: Success rate and reglue rate

Complication	High	Low
Perianal swelling	2	0
Itching	0	1
Incontinence	0	0

[Table/Fig-4]: Complications

Studies	Number of patients (n)	Recurrence	Complete Healing
Our study	30	9 (30%)	21 (70%)
Zmora et al.,	60	8 (29%)	32 (53%)
Sentovich et al.,	48	15 (31%)	33 (69%)
Chan et al.,	10	4 (40%)	6 (60%)
Cintron et al.,	79	31(39%)	48 (61%)
Lindsey et al.,	6	3 (50%)	3 (50%)

[Table/Fig-5]: Comparisons with other studies based on discussion

6 months, was 57%. In the low group, 13 out of the 16 fistulas healed after the first attempt and none of the 3 which were reglued, healed. The success rate at the end of 6 months was 81% [Table/Fig-3]. Two failed patients in the high group developed perianal swellings and pain at 3 weeks, which subsided with conservatively. An adverse reaction (itching) was reported only in one patient (in the low anal fistula group), which caused him to join his duty later by one day. None had any faecal or gas incontinence in the follow up period, after this treatment [Table/Fig-4]. All but one patient could join back his duty on the 2nd postoperative day. The characters of the tracts in the fistulas which failed to heal, were studied and it was found that the failure rate was 85.71% in the recurrent high fistula group as compared to 25% in the recurrent low fistula group (p=0.049). Also, 25% single tracted high fistulas failed to heal, as compared to a 100% healing rate among the single tract low fistulas (p=0.90).

DISCUSSION AND CONCLUSIONS

Fistula in ano produces a constant strain on the patient as well as on the surgeon. Many surgical options for the treatment of anal fistulas have been known, which have the goal of healing the fistula tract, with minimum recurrence and incontinence. The procedures like a fistulotomy, lead to a high rate of faecal and gas incontinence [4]. Other procedures like a seton insertion [5,6] and newer techniques like advancement flaps [4], have been compared with the standard fistulotomy, but no single procedure has yet, become the gold standard for fistula repair. Our study on 14 high anal fistulas and 16 low anal fistulas, has analyzed the outcome after the instillation of fibrin glue in the anal tracts of the patients.

Both primary as well as recurrent fistulas were included. The mean age (48.5 years) in our study was similar to that in the studies of Chan et al., [7] and Zmora et al., [8].

A male preponderance was noted in our study, with a male to female ratio of 6.5: 1. Different studies showed this ratio to vary between 5:1 to 9:17, [9].

The success rate in the high anal fistulas was lower than in that in the low anal fistula, as was also found in the studies of Chan et al., [7] and Cintron et al., [10]. The probable explanation to this is perhaps the constant activity of the sphincteric muscles, which squeezed out fibrin glue from the fistula tract. Sentovich et al.,

[11] also reported that the longer fistulas were significantly more prone to recurrence than the smaller fistulas.

Overall, the recurrence rate in our study was 30%, which was similar to the recurrence rates in the studies of Zmora et al., [8], Sentovich et al., [11], Chan et al., [7] and Cintron et al., [10] [Table/Fig-5].

It seemed that some of the treatment failures in our study were caused by an early expulsion of the fibrin clot from the internal opening, a persistent sepsis in the anal tract or an incomplete obliteration of the tract with fibrin glue. It had been suggested in the past, that suturing of the internal opening prevented the expulsion of the clot, but various recent trials [10-15] have proved that there was no significant change in the healing rate, with this procedure. Nine out of these 10 recurrences (90%), were reported in the first 3 months of the follow up.

Similarly, the average time of recurrence was reported as 2.63 months by Park et al., [16] and as 3.3 months by Cintron et al., [10]. Zmora et al., [8], in his study, reported that a 75% recurrence occurred within 1 month and that a 89% recurrence occurred within 2 months of the procedure. In our study, only 1 patient who appeared to be healed at 3 months, showed a discharge at 6 months of follow up, there by proving that the maximum recurrence occurred before 6 months. Adams et al., [17] also reported that it was uncommon to find recurrences after 6 months. In total, only 1 in 9 patients (11.11%) were healed after the 2nd attempt of using the fibrin glue. Similar results (1 in 8 patients -12.5%) with regluing were reported in the study of Loungnarath et al., [18].

Our study, therefore observed, no significant benefit of the regluing. If a failure occurs after 1 attempt, then the patient should be offered various surgical options. In few studies, healing rates of 25% (Zmora et al., [8]) and 80% (Lindsey et al., [19]) were noticed, after regluing, probably because of some technical flaws during the first attempt. If the technique is standardized and a learning curve is achieved, there should be no reason for a patient of fistula in ano, to have any different result after regluing as compared to that in the 1st attempt. Also, 2 reglued patients in the high group developed perianal abscesses which required a seton drainage and 1 in the low group developed a perianal swelling, which required a fistulotomy. This could possibly be because of some missed side branches in the tracts that could not be curetted and irrigated with saline during the procedure. Perhaps, these side branches had initially caused failure and the accumulated glue in them, had acted as a septic focus for the abscess formation. Similar results were observed by Adams et al., [17] and Witte et al., [20].

The present study did not show any incidence of faecal or gas incontinence in any of the treated patients as also in all the similar studies, especially in the studies of El shobaky et al., [21], Zmora et al., [8] and Lindsey et al., [19].

All the patients could join duty after the 1st day. The only patient, who joined duty 2 days later, was the one who had an adverse reaction in form of local itching. Anti histaminics which were given for 2 days relieved the symptoms.

In the present study, we also analyzed the characters of the fistulas which failed to heal. It was interesting to see a significant better healing in a fistula if no treatment was previously given. It was noticed, that the higher number of fistulae (63%) which

failed to heal, were recurrent (which were previously treated surgically), this number being significantly higher among the high anal fistulas than among the low anal fistulas ($p < 0.05$). Similar results with recurrent fistulas were reported by Loungnarath et al., [18] (62%) and by Park et al., [16] (50%) in their trials. This could possibly be because of the difficulty in finding the original tract for the fibrin glue instillation, among the high recurrent fistulas and also because the scar tissues and the fibrosis gave less adhesions to the fibrin glue and facilitated the dislodgment of the clot.

Thus, the present study showed higher recurrence rates among the recurrent and the multiple branched fistulas, especially in the high anal group.

Fibrin glue treatment is a unique treatment modality for closing the anal fistulas. It is superior to the conventional surgical treatment, in terms of the patient comfort, an undisturbed sphincter function, a reduced overall hospital stay, a decrease in the need of the post operative analgesia and minimized operative trauma, wound pain, complications and adverse reactions. It is an easy, relatively simple, repeatable and a minimally invasive procedure which allows the resumption of normal activities within a short time in all the patients. It is best for the treatment of anal fistulas, which are low and single tracted and which have not been surgically treated before.

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