



COMPARATIVE STUDY OF OUTCOMES OF CORING, DUAL SETON AND LIGATION OF INTERSPHINCTERIC FISTULA TRACT (LIFT) PROCEDURE IN MANAGEMENT OF HIGH FISTULA-IN-ANO

Surgery

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ABSTRACT

INTRODUCTION: A fistula-in-ano is an abnormal tract or cavity establishing a communication between rectum or anal canal and the perianal area. Surgery is the treatment of choice with the goals of draining infection, eradicating the fistulous tract and avoiding persistent or recurrent disease while preserving anal sphincter function. Various surgical options available include fistulotomy / fistulectomy with seton wire placement, advanced flaps, fistula plugs, fibrin glue and more recently newer techniques such as Ligation of the intersphincteric fistula tract (LIFT), Video-assisted anal fistula treatment (VAAFT) and FILAC technique (Fistula-Tract Laser Closure). The present study was conducted to assess and compare the outcome of LIFT procedure, Dual Seton placement and Coring out in complex fistula-in-ano.

MATERIALS AND METHOD: In our study, we have evaluated the record of the 50 cases operated for high and complex fistula between June 2017 to June 2019. Out of 50 cases, 5 cases have undergone for coring out of fistula tract with closure of internal opening, 20 cases were operated for LIFT procedure, and 25 cases were treated by DUAL seton. All cases were done under spinal anesthesia. All cases were done in the Lithotomy position. Basic staples in all the 3 above procedures included diluted hydrogen peroxide and Methylene Blue dye injection through the external opening to determine the patency of the tract. H₂O₂ was mixed along with Methylene Blue before injection to increase the chance of identifying internal opening. In present study we compare the various aspects in the treatment of complex fistula in ano using various modalities such as coring, DUAL Setons and lift procedure.

RESULTS: In our study healing rate in LIFT procedure is 90% and incontinence rate is 0%, anal stricture rate is 0% and Recurrence is 10% and for seton placement the recurrence rate is nil compared to 60% recurrence in coring.

CONCLUSIONS: In our study of patients having complex fistula-in-ano, out of the three procedures Dual seton have least recurrence rates (0%) at the cost of prolonged morbidity, LIFT procedure has low recurrence rate (10%) much better than the Coring which has a very high recurrence rate (60%) with similar morbidity.

KEYWORDS

Fistula -in-ano Ligation Of The Intersphincteric Fistula Tract (lift) Dual Seton Coring

INTRODUCTION

Fistula is an abnormal connection between two hollow organs or between hollow organ and the skin lined by epithelial tissue. In cases of fistula in ano, it is a track that connects deeply the anal canal or rectum to the skin around the anus. The primary opening is deep in the anal canal or rectum and the superficial openings, which may be multiple, are around the perianal skin. Being a common surgical condition, fistula in ano most commonly follows an anorectal sepsis, puts a surgeon in challenging situation to decide about best option for the patient and to satisfy the patient.¹ The main principles of management of anal fistula are closure of internal opening of fistula tract, drainage of infection or necrotic tissue, and eradication of fistulous tract with preservation of sphincter function.² Studies have revealed that high fistulae have low incidence. Low fistulae are the commonest anal fistulae and can be treated easily by conventional laying-open technique. High fistula-in-ano are difficult to treat since the conventional laying-open will lead to division of most of the anal sphincter muscles resulting in incontinence. To achieve the objective in high anal fistulae, different surgical techniques have been described in literature from time to time. These include Park's fistulotomy, insertion of a seton, two-stage fistulotomy, primary seton with occlusion of the internal ostium, fistulotomy with primary repair of the sphincter, endorectal advancement flaps, ano-cutaneous advancement flap, repair of fistula using fibrin adhesive glue and re-routing the fistula.³

Anorectal fistulas are divided into four distinct types according to the Parks' classification: intersphincteric, trans-sphincteric, suprasphincteric, and extrasphincteric. The ultimate goal of fistula surgery is to eradicate it without disturbing or disturbing minimally the anal sphincter mechanism. Hippocrates in 460 BC, first described the seton usage in the treatment of fistula in ano. Ayurvedically medicated Seton, "kshara" was used by sushruta for treating fistula in ano. Lay open

technique for fistula in ano was first described in 1337 by John of Arderene.

Barber surgeon Charles Felix in 1636, treated king Louis XIV with fistulotomy for fistula in ano. Frederik Salmon in 1835, founded Saint Marks Hospital primarily for the treatment of fistula in ano. He recommended a cut back technique to fistulous tract triangular, when it is laid open, so that mucosal edge healed earlier than skin wound.

In British journal of surgery, Parks A.G. et al based on the level of fistula with respect to sphincter, classified fistula in ano into four types. In article published in Germany, Strittmatter B, described various forms of fistula establishing the entire course of the tract was the important factor in achieving cure of the disease and most of the fistula can be treated by fistulotomy or seton when tract is established.

FISTULOTOMY

Fistulotomy means laying open or unroofing of the fistulous tract. After retracting the anal canal, blunt ended probe is introduced through the external opening upto internal opening. Tissue that overlies the probe is divided. Then epithelial lining of the fistulous tract is curetted. Overhanging skin edges excised. If there is any additional tract identified, it is also laid open. Saline gauze is packed initially. Sitz bath is advised later.⁴

SETON TREATMENT

Three types of Setons are Cutting, Draining and Medicated SETON. It is useful in treating high anal fistula. Thin silastic tubing/ monofilament non-absorbable material is used. Patient in lithotomy position, internal and external openings identified with blunt probe. Then the SETON is passed through the external opening through the fistulous tract into internal opening and the end is brought out through anal canal. Then the two ends are knotted parallel with silk to avoid

discomfort to the patient. Rodder's knot is used for this purpose. In case of cutting SETON, after a period of two weeks, the seton is gradually tightened, so as to cut through the anal sphincter progressively. Draining seton is kept for two to three months to drain collection and to control infection. In case of medicated seton, ayurvedic medication increases cutting rate 1 cm per week, with mean cut out time is around 8.3 weeks.⁵

The erapol et al.⁶ described the two-seton placement method, comprising of a drainage seton and a primary cutting seton using two sutures which are threaded through the internal opening. Garcia Olmo et al.⁷ described the multiple seton technique wherein five 1-0 silk sutures are passed along the fistula track (fig. 3a). At weekly intervals, each suture is tightened progressively after taking out the previously tightened suture which becomes lax. Durgun et al.⁸ described the use of multiple setons (four or five No. 1 braided silk threads) as modified cutting setons along with partial fistulotomy wherein the fistula tract is laid open over a grooved probe up to the dentate line.

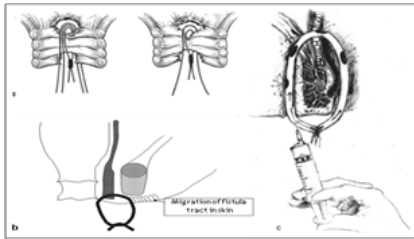


Figure 1. Techniques to alter the mechanism of seton action.
a Multiple seton technique.
b Progressive migration technique.
c Tube loop seton for drainage⁸.

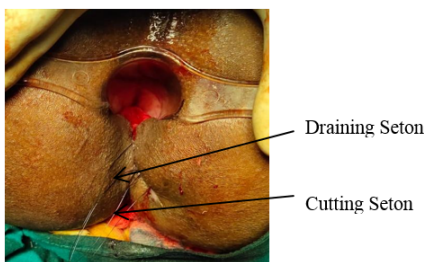


Figure 2. dual seton insertion

LIFT PROCEDURE

Before starting the procedure complete examination under anaesthesia is done including definition of internal opening, course of the fistulous tract with the help of injection of hydrogen peroxide through external opening, gentle probing of the fistula and placement of a malleable fistula probe. Gentle scooping of the fistulous tract is done. A 3 to 4cm incision is made parallel to anal verge in the inter sphincteric groove followed by development of inter sphincteric plane between external and internal anal sphincter with blunt and sharp dissection till the intersphincteric segment of the tract is circumferentially dissected. Fistulous tract is identified and hooked out with mixer forceps followed by placement of two vicryl no.1 sutures for ligation of intersphincteric segment of fistulous tract keeping medial one close to the internal opening and lateral one away from it. After ligation the tract is divided with knife between two sutures followed by doubly securing the ends with figure of 8 stitch. Then wound sutured in layers. The external opening with the distal part of the fistulous tract is cored out and wound is left open.



Figure 3.

Figure 4.



Figure 5.



Figure 6.

Figure 3: Wound after ligating the intersphincteric segment of the fistula tract (two ligating sutures placed one towards the bowel and another away from it)

Figure 4: Showing transection of the intersphincteric fistulous tract between two ligatures.

Figure 5: Wound after doubly securing the ligated fistulous tract ends with figure of eight stitch.

Figure 6: Wound after closure.

FIBRIN GLUE

Fibrin glue is mixture of fibrinogen, thrombin and calcium ion. When injected into the fistulous tract, it combines and forms fibrin clot by conversion of fibrinogen into fibrin. After 7 to 14 days of injection, tract is converted and filled with synthetic collagen.⁹

FIBRIN PLUG

It was first used in 2006 for anal fistula. Lipophilised small intestinal submucosa of the porcine is used. It is a conical shaped plug maintains stability within the fistulous tract prevents dislodgement during defecation.

ENDO ADVANCEMENT FLAP

Fistulous tract is identified, and internal opening excised. Defect is then closed with advancement flap. The flap contains rectal mucosa, submucosa and part of the internal sphincter. The flap has an apex and base. The base of the flap is twice as thick as apex, placed beyond closed mucosal defect.^{10,11,12}

STEM CELL THERAPY

Adipose derived stem cells used. It is successfully used in complex anal fistula, results are promising.

CORING

Fistulectomy involves coring out of the fistula by either sharp dissection or diathermy cautery. It allows better definition of fistula anatomy than fistulotomy, especially the level at which the tract crosses the sphincters and the presence of secondary extensions. After excision of the fistulous tract with minimum damage to the sphincters the internal opening is secured with vicryl 2-0 suture and the external wound is left open.

MATERIALS AND METHODS

In present study we compare the various aspects in the treatment of complex fistula in ano using various modalities such as coring, DUAL setons and lift procedure.

Patients admitted in SMIMER Hospital Surat with features of high Fistula in Ano were included in the study. Data was collected by thorough history taking, clinical examination, investigations, a collection of per-operative and postoperative complications, and follow up period of 18 to 24 months.

INCLUSION CRITERIA

- All cases presenting with features of complex and high anal fistula in general surgery opd.

EXCLUSION CRITERIA

- Patients age < 12 years.
- Complex fistula in ano with multiple internal and external opening.
- Patients developed fistula in ano as a complication of inflammatory bowel diseases like Crohn's disease and ulcerative colitis.
- Those patients who developed fistula in ano as a complication of radiation therapy.
- A patient who developed fistula in ano as a complication of extrapulmonary tuberculosis.
- Patients who developed fistula in ano as a complication of

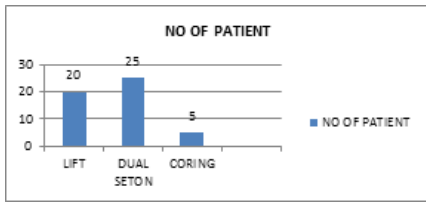
anorectal malignancy.

All patients has been optimized before surgery and sepsis kept under control. In our study, we have evaluated the record of the 50 cases operated for high and complex fistula between june 2018 to june 2019 .Out of 50cases, 5 cases has undergone for coring out of fistula tract with closure of internal opening,20 cases were operated for LIFT procedure, and 25 cases were treated by DUAL seton. All cases were done under spinal anesthesia. All cases were done in the Lithotomy position.Basic stpes in all the above procedures included Methylene Blue dye injection through the external opening to determine the patency of the tract. H₂O₂ was mixed along with Methylene Blue before injection to increase the chance of identifying internal opening, because Oxygen-derived free radicals liberate gas through the stenotic internal opening. Gentle probing of the tract through external opening done. Iatrogenic injury due to probing was looked for and ruled out. After completing the procedure, anal pack kept and T bandage applied. Patients were shifted to the ward and adequate analgesics and antibiotics are given. Oral fluids started after 8 hours of surgery. The anal pack was removed on the first postoperative day. Hot sitz bath was advised thrice a day and Normal diet was started from the 1st post-operative day. If patients improved clinically, they were discharged and advised to attend surgical OPD for regular follow up.

RESULTS

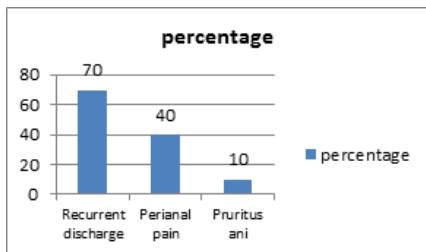
In our study of 50 cases with fistula in ano, about 40 cases (i.e.) 80% of cases have the previous history of Incision and drainage for a perianal abscess. Of those 40 cases, about 25 patients have I and D history within 1 year of duration, 7 patients have I and D history 1 - 2-year interval, 5 patients have I and D history 2 - 3-year interval and 3 patients have I and D history before 3 years.

In our study of 50 cases of fistula in ano, we had done LIFT procedure in 20 cases, DUAL SETON treatment in 25 cases and coring in 5 cases selected randomly (Graph – 1).



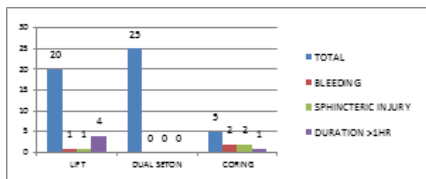
Graph 1: Number of cases in 3 study groups.

In our study the most common presenting symptom was recurrent discharge (70%),perianal pain(40%) And pruritus ani(10%).



Graph 2 : Symptomatology

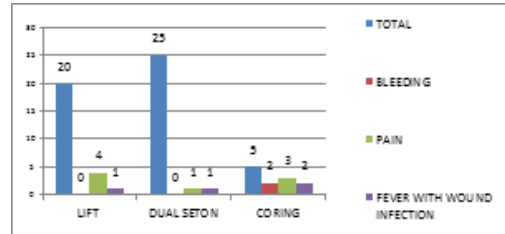
In our study, of those 5 cases of coring, 2 cases developed intraop er ative bleeding, 2 cases developed sphincter injury and 1 case had prolo nged surgery more than 1 hour. Cases proceeded with DUAL SETON did not develop any obvious intraoperative complication. Of 20 cases with LIFT, 1 case developed intraoperative bleeding, 1 case developed sphincter injury and 4 cases had prolonged surgery more than 1 hour(Graph–3).



Graph 3: Intra-operative complications among patients of 3 study

groups.

In our study, 5 cases of CORING, 2 patients developed bleeding postoperatively, 3 patients developed pain, 1 patient developed short-term anal incontinence and 2 patients developed fever with wound infection. Rarely patients with DUAL SETON and LIFT procedure developed complications postoperatively.1 patient with DUAL SETON developed the pain, 4 patients with LIFT developed pain and 1 patient each with LIFT procedure and DUAL SETON developed fever and wound infection (Graph – 4).



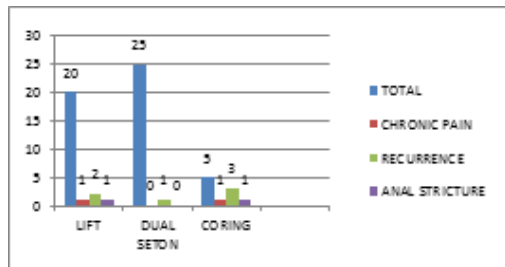
Graph 4: Short term post-operative complications among patients.

MEAN HOSPITAL STAY:

Table 1: Mean Hospital Stay

PROCEDURE	MEAN HOSPITAL STAY(DAYS)
LIFT	3 days(±1)
DUAL SETON	2 days(±1)
CORING	5 days(±1)

Complications we expected on long term follow up (6 months to 1 year) were chronic pain, anal incontinence, recurrence and anal stricture. Chronic pain was seen in, 1 case of CORING and 1 cases of LIFT treatment. 3 cases of CORING and 2 cases of LIFT and 1 case of DUAL SETON procedure encountered recurrence. In further evaluation of the recurrent cases, recurrence designated in DUAL seton was actually not a recurrence but was a new fistula with a new opening. No anal stricture was seen in any of the 3 procedures (Graph – 5).



Graph 5: Complications on long term follow up (6 months to 1 year).

DISCUSSION

In our study , 80% of the patients gave a history of incision and drainage for a perianal abscess and of those 63% of cases have a history of incision and drainage within 1 year and rest have a history of I and D more than 1 year . Only 20% cases did not have history of incision and drainage . In our study, about 80% patients are males and 20% cases are females. Male / female ratio of fistula in ano is 4:1. Tan Kk, et al.¹³ reported that discharge from the external opening is the most common symptom of fistula in ano. In our study also most common symptom was perianal discharge from the external opening that is 70% followed by perianal pain (40%) and pruritus ani (10%).

We have evaluated the record of all 50 patients for per operative and immediate postoperative complications in each procedure carefully. Results showed, more complications occur with coring than other procedures. In most of the cases, we identified both external and internal opening clinically. All pateits have MRI perineum with schematic diagram of the fistula.

In our study, short term incontinence was noted in 1 out of 5 patient of coring (20%) but there is no long term incontinence. The most serious complication of the treatment for fistula-in-ano is postoperative anal incontinence, with reported incontinence rates ranging from 0 to

40%¹⁴. In our study recurrence rate for DUAL seton was nil. A study conducted by Hamalainen et al¹⁵ on 44 patients undergoing cutting seton wire placement reported a recurrence of 6%. Intra operatively we experienced bleeding in 2 cases of coring. Intra operative bleeding was not noted in DUAL seton and LIFT procedure. Sphincter was injured in 2 cases of coring. Sphincter injury was not noted in LIFT procedure and DUAL seton.

Operating time was extended for more than 1 hour in 1 cases of DUAL seton and 4 cases of LIFT procedure and. About, 3 patients of coring, 1 patient of DUAL seton and 4 patients of LIFT procedure experienced postoperative pain for more than 3 days. Post-operative bleeding occurs in 2 patients with coring. No patients with LIFT procedure and DUAL seton experienced a post-operative bleeding complication. Post-operative fever wound infection and wound discharge occurred in 2 cases of coring, 1 case of LIFT and DUAL seton procedure which was settled down with the administration of appropriate antibiotics. Mean hospital stay for coring was 5±1 days, for LIFT procedure was 3±1 days and for DUAL seton was 2±1 days. LIFT procedure was presented by Rojanasky in 2007 with a healing rate of about 94%¹⁶. However, later study shows healing rate in LIFT procedure ranges from 57% to 83%. Vesalii Bruxellensis Andreae in 2010 report incontinence rate with LIFT procedure of 0%. In our study healing rate in LIFT procedure is 96% and incontinence rate is 0%, anal stricture rate is 0%.

Only 2 out of 20 cases (10%) cases in the LIFT procedure group developed recurrence. Those 2 patients who developed recurrence at 6 months after LIFT were of intersphincteric type (low type) and they were managed with fistulotomy. In a study conducted by Wallin et al¹⁷ on 93 patients undergoing LIFT procedure, 26% had recurrence.

CONCLUSION

In our study of patients having complex fistula-in-ano, out of the three procedures Dual seton have least recurrence rates (0%) at the cost of prolonged morbidity, LIFT procedure has low recurrence rate (10%) much better than the Coring which has a very high recurrence rate (60%) with similar morbidity.

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