

Case Report

Total Anal Sphincter Saving Technique for Fistula-in-Ano; The Ligation of Intersphincteric Fistula Tract

Arun Rojanasakul MD*, Jirawat Pattanaarun MD*,
Chucheep Sahakitrungruang MD*, Kasaya Tantiphlachiva MD*

* Division of Colorectal Surgery, Chulalongkorn University

Objective: To describe a new technique for fistula-in-ano surgery aimed at total sphincter preservation, and evaluate the preliminary results concerning non-healing and intact anal function.

Material and Method: A prospective observational study in eighteen fistula-in-ano patients treated by ligation of intersphincteric fistula tract (LIFT) technique, from January to June 2006.

Results: Fistula-in-ano in seventeen patients healed primarily (94.4%). There was one non-healing case (5.6%). The mean healing time was four weeks. None had disturbances in clinical anal continence.

Conclusion: The early outcome of the LIFT technique is quite impressive. Results warrant a larger study with long-term evaluation. This technique has the potential to become a viable option for fistula-in-ano surgery.

Keywords: Fistula-in-ano, Anorectal fistula, Sphincter saving operation, Nonhealing of fistula-in-ano

J Med Assoc Thai 2007; 90 (3): 581-6

Full text. e-Journal: <http://www.medassocthai.org/journal>

Fistula-in-ano is the chronic phase of anorectal infection and is characterized by chronic purulent drainage or cyclical pain associated with abscess re-accumulation followed by intermittent spontaneous decompression⁽¹⁾. The goals of surgery for fistula-in-ano are permanent healing and preservation of anal continence. Traditional surgical techniques, namely fistulotomy and seton technique, sever the internal anal sphincters and may damage the external anal sphincters. The recurrent rate of "lay-open" fistulotomy was reported between 2-9 percent^(2,3) with functional impairment ranging from 0 to 17 percent^(2,3). The use of a seton had a recurrence rate between 0-8 percent. Minor and major incontinence was of 34-64 percent and 2-26 percent, respectively⁽⁴⁻¹⁰⁾. Currently, the recommended surgical techniques, for complex fistula-in-ano, are endorectal advancement flap, anocutaneous advancement flap, and direct excision and closure of internal opening. The endorectal advancement flap has a healing rate of 55-98 percent with the minor and major incontinence of 31 and 12 percent respectively⁽¹¹⁻¹⁵⁾. The anocutaneous advancement flap procedure has a healing rate of 78 percent.

Correspondence to : Rojanasakul A, Division of Colorectal Surgery, Chulalongkorn University, Bangkok 10330, Thailand.

Deterioration of continence is 30 percent⁽¹⁶⁾. Direct closure of the internal opening has a 22.5 percent recurrence rate and 6 percent minor incontinence⁽¹⁷⁾. Other alternative approaches are the application of fibrin glue and fistula plug. The healing rate after debridement and fibrin glue injection ranged from 14-60 percent⁽¹⁸⁻²⁰⁾. Incontinence may not be affected and was not generally reported. Fistula plug, the latest technique for complex fistula-in-ano repair, had a reported failure rate of 13 percent⁽²¹⁾.

Fistula-in-ano does not heal spontaneously due to two main reasons. Firstly, fecal particles can enter the primary opening causing infection. Secondly, the intersphincteric fistula tract is compressed between internal and external anal sphincter, thus causing intermittent closed septic foci and persistent sepsis. The authors proposed that ligation and excision of the intersphincteric tract could close the entrance for fecal particles into the fistula tract and, at the same time, eliminate the intersphincteric septic nidus. This may result in healing of fistula-in-ano. This procedure does not sever the anal sphincters and postoperative anal function can remain intact.

The authors conducted a prospective observational study to evaluate this new sphincter saving

operation for fistula-in-ano and to evaluate early outcomes.

Material and Method

From January 2006 to June 2006, fistula-in-ano patients in King Chulalongkorn Memorial Hospital were randomly assigned to be operated on by the senior author. Eighteen patients (14 males, 4 females) were operated on with ligation of the intersphincteric fistulous tract (LIFT) technique.

Included were patients who were clinically continent and normal hosts. All patients were fully informed about the procedure.

Definitions

Type of fistula-in-ano

Low transphincteric fistula: The fistula tract passes between or just above the subcutaneous external anal sphincter.

Transphincteric fistula: The fistula tract passes through the superficial or deep external anal sphincter.

Suprasphincteric fistula: The fistula tract passes above puborectalis muscle.

Assessment of wound healing

Grade 1: complete epithelialization of the wound

Grade 2: healing wound with granulation

Grade 3: granulation with purulent discharge

Grade 4, non-healing: the wound did not heal at ten weeks or re-operation was needed

Assessment of Clinical Continent

Clinical continence grading⁽²²⁾

Category A: continent of solid and liquid stools and flatus (i.e. normal continence)

Category B: continent of solid and usually liquid stools but not flatus (no fecal leakage)

Category C: acceptable continence for solid stool but no control over liquid stool or flatus (intermittent fecal leakage)

Category D: continued fecal leakage

The authors performed pre- and post operative digital examination to assess the integrity of the anal sphincter muscles.

Operative Techniques: Ligation of Intersphincteric Fistulous Tract (LIFT) technique

Preoperative rectal enema was carried out the night before surgery. The procedures were performed in prone jackknife position, under regional anesthesia. The steps of the procedure are as follows; the location

of the internal opening was identified by injection of water through the external opening or gently probing the fistula tract. The inter-sphincteric plane at the site of fistulous tract was entered via curvilinear incision. The inter-sphincteric tract was identified by meticulous dissection, using scissors and electrical cautery. The exposure of the inter-sphincteric plane was facilitated using specially-designed long and narrow blade retractors. The inter-sphincteric tract was hooked using a small right-angled clamp. The tract was then ligated close to the internal sphincter with polyglactin no. 3/0. After that, the tract was divided distal to the point of ligation. The remnant of the inter-sphincteric tract or possibly the infected gland was removed and sent for histo-pathology study. The water was injected through the external opening once more to confirm that the tract was correctly divided. The fistulous tract would then be thoroughly curetted. The external opening was adequately drained by additional incision. The last step is re-approximation of the inter-sphincteric incision wound loosely with interrupted polyglactin 3/0 (Fig. 1-5).

Study Design, Perioperative Management, and Follow-Up Data

This was a prospective, observational study. After the operation, no restriction of diet was required. The patients were advised to self-care their wounds by cleansing with tap water. All patients received oral ciprofloxacin and metronidazole for two weeks. They were planned for discharge the next day. The following data were collected:

- Location of the external and internal opening, and types of fistula.

- Wound healing grade was recorded at the first week after the operation and then every 2 weeks until the wound was completely healed (grade 1).

- The clinical continence was noted as above.

The mean and range, number and percent were used to describe the results.

Results

There were 18 patients (14 males, 4 females), aged between 26 to 72 years (mean age 36 years). Types of fistula-in-ano were low transphincteric type (n = 13) and dorsal semi-horseshoe fistula (n = 5) which were high transphincteric type (n = 4) and suprasphincteric type (n = 1). Mean operative time was 40 minutes (range from 30 to 80 minutes). Mean length of stay was 1.25 days (range from 0.5-5 days). Mean healing time was 4.0 weeks (range from 1-8 weeks). The longest follow

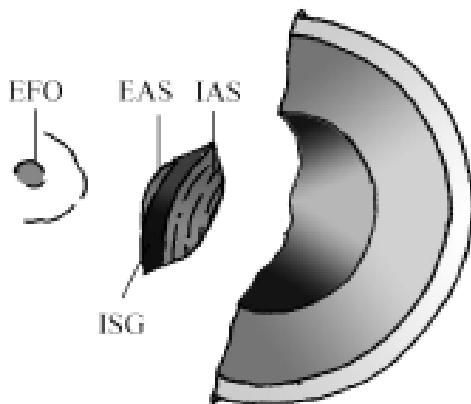


Fig. 1 The intersphincteric space is explored through curvilinear incision
 EFO = External fistula opening
 EAS = External anal sphincter
 IAS = Internal anal sphincter
 ISG = Intersphincteric groove

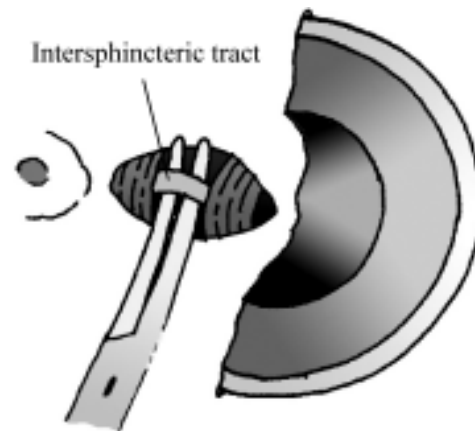


Fig. 3 The intersphincteric fistula tract is hooked up with small right-angled clamp

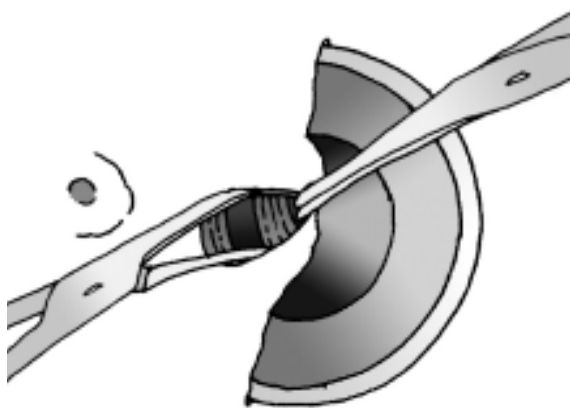


Fig. 2 Intersphincteric plane is dissected with fine scissors

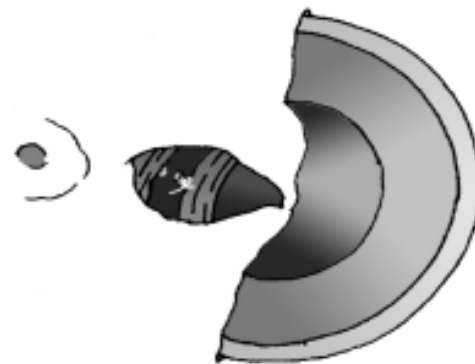


Fig. 4 The intersphincteric tract is ligated near internal anal sphincter, and divide

up was 26 weeks. Primary healing (grade 1) of intersphincteric incision occurred in all patients in less than 3 weeks. The external opening wound healed in seventeen patients (94.4%). One fistula in the low transphincteric group did not heal (grade 4, non-healing) (5.6%). There was no change of the continence status (category A) in all patients. There was no major post operative complication.

Discussion

Fistulotomy has been performed since ancient times. The outcome is generally acceptable. However, fistulotomy causes various degrees of anal sphincter

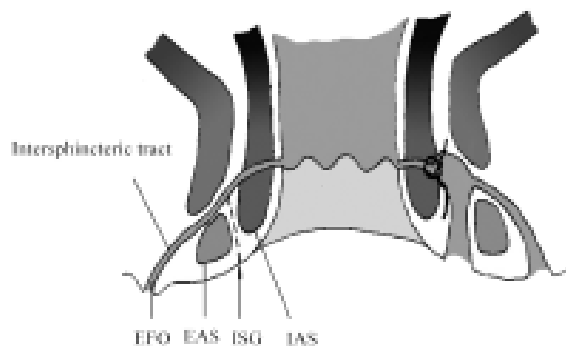


Fig. 5 Illustration of the ligation of an intersphincteric fistulous tract
 EFO = External fistula opening,
 EAS = External anal sphincter
 IAS = Internal anal sphincter
 ISG = Intersphincteric groove

injury. The incontinence status was underestimated and under-reported. The seton technique was to minimize incontinence, but only with moderate success. Recently, many techniques have been developed, such as endorectal advancement flap, anoderm island flap, excision and closure of internal opening, fibrin glue, and fistula plug. These techniques have less risk of anal incontinence, despite some recurrences. These procedures are technically demanding, operator dependent, interfering with re-operation when needed, unable to perform in the previously-scarred anus and the cost of required materials. At present, there is no single technique appropriate for all types of fistula-in-ano, either simple or complex, which have superior outcomes, and authorities are still searching for such an ideal technique.

During the past twenty years, the author used many techniques to manage complex fistula-in-ano such as Seton, Park's fistulotomy, modified Hanley's fistulotomy, endorectal advancement flap. Each technique was used with comparable results. During 2004 to 2005, the author used the intersphincteric-suturing approach for complex fistula-in-ano in twenty patients. The steps begin with coring out fistula tract from external opening to external sphincter. This is followed by dissection and excision of the inter-sphincteric fistulous tract, then repairing of the external and internal anal sphincter defects through the inter-sphincteric route. Primary healing was accomplished in 45 percent of the patients. The authors suggest that the reason for the low primary healing rate was breakdown of sutures at the internal opening. Avoidance of suturing by ligation of the inter-sphincteric fistulous tract may solve the problem.

Finally, the authors developed "the Ligation of Intersphincteric Fistula Tract (LIFT) technique" instead of excision and suture the internal opening. As described, the technique disconnects the internal opening from the fistulous tract and removes the infected anal gland residual, without dividing any part of the anal sphincter complex. The authors' follow-up data shows no post operative complication. Primary healing occurred in 17 patients (94.4%) with an average healing time of 4 weeks. No clinical incontinence was reported by the patients. Only one patient with low transphincteric fistula had a non-healing wound. This may be due to the incorrect identification of the inter-sphincteric tract. The patient underwent re-operation with LIFT technique and the fistula healed.

The authors proposed that the advantages of the LIFT technique are 1) anal sphincter saving, 2)

minimal tissue injury resulting in a shorter healing time, 3) small scar, 4) the procedure can be done in previously-operated patients, and lastly 5) the procedure will not compromise any need for re-operation in case of recurrence. At the beginning, the authors used LIFT technique only for complex fistulae but since the early results were good, the authors are now using this technique for nearly all fistula-in-ano patients. The major concern is long-term recurrence. The authors are optimistic that long-term recurrence is unlikely since it was found that true recurrence after complete healing is not common. The procedure is economic since healing time is short and no specialized or expensive materials were required.

Conclusion

The LIFT technique is based on sound principles. It is simple, less invasive and the early results are satisfactory. However, the authors still need long-term follow up data and might expect that this technique will become an option for most anorectal fistula repairs.

Acknowledgements

All figures are illustrated by Patpong Navichareon, MD, Department of Surgery, Chulalongkorn University. The authors appreciate the editorial assistance from the staff of the Division of Research Affairs of the Department of Medicine. The authors have no conflict of interest to declare.

References

1. Whiteford MH, Kilkenny J III, Hyman N, Buie WD, Cohen J, Orsay C, et al. Practice parameters for the treatment of perianal abscess and fistula-in-ano (revised). *Dis Colon Rectum* 2005; 48: 1337-42.
2. Vasilevsky CA, Gordon PH. The incidence of recurrent abscesses or fistula-in-ano following anorectal suppuration. *Dis Colon Rectum* 1984; 27: 126-30.
3. van Tets WF, Kuijpers HC. Continence disorders after anal fistulotomy. *Dis Colon Rectum* 1994; 37: 1194-7.
4. Williams JG, MacLeod CA, Rothenberger DA, Goldberg SM. Seton treatment of high anal fistulae. *Br J Surg* 1991; 78: 1159-61.
5. Garcia-Aguilar J, Belmonte C, Wong DW, Goldberg SM, Madoff RD. Cutting seton versus two-stage seton fistulotomy in the surgical management of high anal fistula. *Br J Surg* 1998; 85: 243-5.
6. Pearl RK, Andrews JR, Orsay CP, Weisman RI,

- Prasad ML, Nelson RL, et al. Role of the seton in the management of anorectal fistulas. *Dis Colon Rectum* 1993; 36: 573-7.
7. Isbister WH, Al Sanea N. The cutting seton: an experience at King Faisal Specialist Hospital. *Dis Colon Rectum* 2001; 44: 722-7.
 8. Dziki A, Bartos M. Seton treatment of anal fistula: experience with a new modification. *Eur J Surg* 1998; 164: 543-8.
 9. Hamalainen KP, Sainio AP. Cutting seton for anal fistulas: high risk of minor control defects. *Dis Colon Rectum* 1997; 40: 1443-6.
 10. Van Tets WF, Kuijpers JH. Seton treatment of perianal fistula with high anal or rectal opening. *Br J Surg* 1995; 82: 895-7.
 11. Kodner IJ, Mazor A, Shemesh EI, Fry RD, Fleshman JW, Birnbaum EH. Endorectal advancement flap repair of rectovaginal and other complicated anorectal fistulas. *Surgery* 1993; 114: 682-9.
 12. Aguilar PS, Plasencia G, Hardy TG Jr, Hartmann RF, Stewart WR. Mucosal advancement in the treatment of anal fistula. *Dis Colon Rectum* 1985; 28: 496-8.
 13. Schouten WR, Zimmerman DD, Briel JW. Transanal advancement flap repair of transsphincteric fistulas. *Dis Colon Rectum* 1999; 42: 1419-22.
 14. Gustafsson UM, Graf W. Excision of anal fistula with closure of the internal opening: functional and manometric results. *Dis Colon Rectum* 2002; 45: 1672-8.
 15. Kreis ME, Jehle EC, Ohlemann M, Becker HD, Starlinger MJ. Functional results after transanal rectal advancement flap repair of trans-sphincteric fistula. *Br J Surg* 1998; 85: 240-2.
 16. Zimmerman DD, Briel JW, Gosselink MP, Schouten WR. Anocutaneous advancement flap repair of transsphincteric fistulas. *Dis Colon Rectum* 2001; 44: 1474-80.
 17. Athanasiadis S, Helmes C, Yazigi R, Kohler A. The direct closure of the internal fistula opening without advancement flap for transsphincteric fistulas-in-ano. *Dis Colon Rectum* 2004; 47: 1174-80.
 18. Abel ME, Chiu YS, Russell TR, Volpe PA. Autologous fibrin glue in the treatment of rectovaginal and complex fistulas. *Dis Colon Rectum* 1993; 36: 447-9.
 19. Buchanan GN, Bartram CI, Phillips RK, Gould SW, Halligan S, Rockall TA, et al. Efficacy of fibrin sealant in the management of complex anal fistula: a prospective trial. *Dis Colon Rectum* 2003; 46: 1167-74.
 20. Cintron JR, Park JJ, Orsay CP, Pearl RK, Nelson RL, Sone JH, et al. Repair of fistulas-in-ano using fibrin adhesive: long-term follow-up. *Dis Colon Rectum* 2000; 43: 944-9.
 21. Johnson EK, Gaw JU, Armstrong DN. Efficacy of anal fistula plug vs. fibrin glue in closure of anorectal fistulas. *Dis Colon Rectum* 2006; 49: 371-6.
 22. Browning GG, Parks AG. Postanal repair for neuropathic faecal incontinence: correlation of clinical result and anal canal pressures. *Br J Surg* 1983; 70: 101-4.

การผ่าตัดฝีคัณฑสูตรเรื้อรังแบบเก็บหูรดด้วยวิธีผูกท่อฝีคัณฑสูตรในช่องระหว่างกล้ามเนื้อหูรด

อรุณ โรจนสกุล, จิรวัดน์ พัฒนะอรุณ, ชูชีพ สหกิจรุ่งเรือง, กษยา ตันติผลาชีวะ

วัตถุประสงค์: เพื่อนำเสนอวิธีการผ่าตัดฝีคัณฑสูตรเรื้อรังด้วยวิธีการผูกท่อฝีคัณฑสูตรในช่องระหว่างกล้ามเนื้อหูรด และศึกษาถึงผลการรักษาในแง่การหายของฝีคัณฑสูตรและการกลั้นอุจจาระ

วัสดุและวิธีการ: เป็นการศึกษาไปข้างหน้าแบบสังเกตการณ์ ในผู้ป่วยฝีคัณฑสูตรเรื้อรัง 18 รายที่มารับการผ่าตัดในโรงพยาบาลจุฬาลงกรณ์ระหว่างเดือนมกราคมถึงมิถุนายน พ.ศ. 2549 ด้วยวิธีการผูกท่อฝีคัณฑสูตรในช่องระหว่างกล้ามเนื้อหูรด

ผลการรักษา: ผู้ป่วยเป็นชาย 14 คน หญิง 4 คน อายุระหว่าง 26-72 ปี (เฉลี่ย 36 ปี) เป็นฝีคัณฑสูตรชนิด low trans-sphincteric type 13 รายและเป็น posterior semihorseshoe type 5 ราย ผลการผ่าตัดพบว่าฝีคัณฑสูตรหาย 17 ราย (94.4%) ไม่หายและต้องผ่าตัดซ้ำ 1 ราย (5.6%) การประเมินการกลั้นอุจจาระทางคลินิกไม่พบความแตกต่างของการกลั้นอุจจาระระหว่างก่อนและหลังผ่าตัดในผู้ป่วยทุกราย

สรุป: การผ่าตัดฝีคัณฑสูตรเรื้อรังด้วยวิธีการผูกท่อฝีคัณฑสูตรในช่องระหว่างกล้ามเนื้อหูรดในรายงานนี้ได้ผลดีเป็นที่พึงพอใจซึ่งจะใช้รายงานผลในผู้ป่วยจำนวนมากขึ้นและติดตามผลระยะยาวต่อไป คาดหวังว่าวิธีการนี้จะเป็นทางเลือกหนึ่งในการรักษาฝีคัณฑสูตร
