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MANAGEMENT OF COMPLEX POSTERIOR HORSESHOE ANAL FISTULA BY A MODIFIED HANLEY PROCEDURE: CLINICAL EXPERIENCE AND REVIEW OF 28 PATIENTS

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Abstract

The aim of this prospective study was to document clinical experience in the surgical management of posterior horse shoe fistula of cryptogalndular origin with a modified Hanley procedure using hybrid elastic glove as a one stage cutting seton.

A modified Hanley procedure was applied to 28 patients (20 males and 8 females) presented with posterior horseshoe anal fistula (mean age 41 years) for the period from February 2007 to March 2012, and the surgical results were analyzes.

The seton used was fashioned from a surgical glove and was tied around the sphincter under less tension in addition to the excision of superficial segment of the lateral tract and deeper extension into ischiorectal spaces were curetted and packed with gauze socked with povidon iodine.

Complete healing was achieved in all 28 patients within three months post-operative period. Recurrence was found in only three patients after six month follow up period. All patients were discharged on the same post-operative day (day case surgery). None required readmission and post-operative pain was mild and bearable. Narcotic analgesics were not needed after discharge. All patients were able to return to their works and daily activity in 2-3 weeks.

In conclusion, posterior complex horseshoe anal fistula can be safely and successfully treated with modified Hanley procedure with the use of the hybrid elastic seton.

Introduction

Anorectal fistula is an inflammatory tract or abnormal connection between the epitheliazed surface of the anal canal and most frequently, the perianal skin or perineum[1]. It often evolves from a spontaneously draining anorectal abscess. Perianal fistula disease has significant implications for the patient's quality of life as a sequelae range from minor pain and social hygienic embarrassment to frank sepsis[2]. The management of the anorectal fistula remained one of the most challenging and controversial topic in colorectal surgery. Surgery is the mainstay of therapy with the aim of draining local infection eradicating the fistulous tract and prevention recurrence while preserving native sphincter function[2,3]. The surgical approach depends on several factors such as the etiology, location, type and duration of the fistula as well as previously performed procedure and preoperative sphincter function[4].

Most internal opening of the fistula are located around the anal glands surrounding the dentate line since over 90% result from a crypto glandular abscess originating from the crypts of Morgagni which are located between the anal orifice and the dentate line are referred to as anal in origin or low type while fistula that originate above the dentate line as high type fistula[5].

The course of an anorectal fistula follows one of four pathways: inter-sphincter

(45%) trans-sphincteric (30%), supra-sphincteric (20%) or extra-sphincteric (5%) before existing at the perianal skin[5].
Although the drainage of perianal abscess is effective in resolving the inflammatory process, the patient is at risk for developing chronic anal fistula or recurrent perianal sepsis or both. The condition occurs in 35-50% of patients after a first time perianal abscess[6].

Horseshoe anal fistula is an anal fistula partially encircling the anus and opening at both ends on the cutaneous surfaces[6]. The male to female ratio is 1.8-1.Two main types of horseshoe anal fistula are observed: the anterior type which is less frequent and has its origin in the anterior part of the subepithelial space. Other type which is most common is the posterior type which has its origin in the post-anal space[7].

Contrary to the general belief that the horseshoe fistula is the cause of posterior deep anal abscess, fistula follows the development of deep post anal space abscess as its complication. The development of anorectal fistula disease are well demonstrated by Malouf et al[8]. At first, infection and abscess of the crypt gland develops in the inter sphincteric space .Abscess may spread vertically, horizontally or circumferentially and this determine the site of abscess. Circumferential spread may occur in the inter sphincteric ,ischiorectal or supralevater compartment to form a horseshow fistula[8]. If the abscesses are not drained either surgically or spontaneously at this stage they spread extensively into the ischiorectal space. This spread result in anterior and posterior horseshoe abscess and fistula.

Although horseshoe fistula does not occur often, they are a type of anal fistula challenging and difficult to treat. They are a particularly aggressive form of anorectal abscess and fistula because there is an erratic pattern of spread in a ring like fashion to the deep post anal or rarely to the deep preanal space and them to the ischiorectal space. Therefore the typical horseshoe fistula is composed of bilateral external openings joined by a deep post anal communication in the post midline, resulting in a Uor horseshoe –shaped configuration[9]. Patients with horseshoe fistula usually undergo multiple drainage and unsuccessful fistula surgery before they reach to get a definitive diagnosis and treatment. The aggressive nature of this type of fistula is also confirmed by the high rate of Crohns disease in patients with horseshoe fistula[10,11].

The patients of horseshow fistula are usually advice surgery for their problems. There are several operation like fistulotomy, cutting seton, fibrin glue injection, fistula plug and endorectal advancement flap[11]. It was found that all these procedures are just temporary solutions as invariably the fistula recurs. Besides, a lot of complications can occur due to surgery like urinary retention, bleeding, thrombosed pile, and fecal impaction, incontinence of stool, anal stenosis and delayed wounds healing. Treatment of horseshow fistula by fecal diversion alone did not resolve horseshoe fistula[12].

Horseshoe fistula is one of the most complex and potentially morbid conditions faced in a modern anorectal surgery. Hanley, 1965 reported his original procedure for horseshoe fistula which involved complete division of the posterior 12 o'clock sphincter mechanism down to the deep post anal space, counter drains were placed through each lateral extension and were removed several week s after wards. Note surprisingly this aggressive procedure obliterated the source of the fistula but at the inevitable price of high incidence of anorectal incontinence. This was followed by the modified Hanley procedure 1990, in which the posterior sphincter was divided gradually by using a cutting hybrid seton placed around the 6 o'clock sphincter mechanism, this seton was serially tightened until the posterior sphincter was

divided and it was tethered by resulting scar tissue[12].

Hanley procedure with drainage of deep post anal space and cutting and drainage hybrid setons proved to be safe, successful and did not result in fecal incontinence. Complete healing of the fistula may take weeks or several months but patients remain functional even with seton in place[13].

This study present the effectiveness and the results obtained with modified Hanley operation in the surgical management of 28 patients presented with a complex horseshoe anal fistula.

Aim of the study was to document our clinical experience in managing patients with horseshoe fistula of cryptoglandular origin with modification of Hanley procedure using a hybrid cutting one-stage cutting seton.

Patients and method

This is a prospective study done from the period between February 2007 to March 2012, 28 patients' 20 males and 8 females were presented with chronic horseshoe fistula. Age range from 19-73 years.

Inclusion criteria were; posterior horseshoe complex fistula defined as fistulas have multiple tracts with a single or multiple external opening, the deep post anal space affection is demonstrated by digital rectal examination and by preoperative MRI.

Exclusion criteria included patients with low and superficial fistulas, Patients with no deep post anal space affection and patients with fistula secondary to other pathology rather that cryptoglandular anal infection (example: malignancy IBD, especially Crohn,s disease, trauma, radiation).

All patients were subjected to the preoperative measures which include: detailed history, thorough and full clinical examination including PR examination to check for sphincter tone, preoperative MRI to demonstrate the extent of fistula and to demonstrate the deep post anal space affection. Routine preoperative laboratory investigations were done and informed consent was taken from all patients. All patients were prepared preoperatively by fasting and enema the night before surgery. All operations were performed with patients in the lithotomy position and under GA except in 3 patients where spinal anesthesia was used due to contraindication to GA. During operation, the fistulous tract was gently probed with small blunt tipped, malleable metal probe. The hybrid seton was created by cutting a thin circular strip from a surgical glove including its thicker sleeve. The portion of the tract outside the sphincter was laid open and curetted; in addition to excision of the superficial segment of the lateral tract ischiorectal spaces were curetted as well. The hybrid seton was tied to the tip of metal probe and inserted through the remaining tract in a double stand fashion or it was dram into position using No. 2 silk suture. The skin and anoderm overlaying the fistulous tract incised. This double strand elastic seton was then tied over itself on the sphincter without excessive tension, hence the definite of (hybrid seton).

Postoperative continence was assessed using the classification according to Wexner score for fecal incontinence and according to Browing and Parks classifications in which category a represent those continent for solid and liquid and flatus (i.e. normal continence), category b those continent for solid and liquid stool but not for flatus, category c those continent for solid stool with no control over and category d those with continued fecal leakage. In this study we found 0% incontinence.

Postoperatively the patients were informed about the presence of the rubber prosthesis and advice for gentle cleansing of anal region after each bowel motion. All patients were discharged on the same day of surgery, none required readmission or needed narcotic analgesic after discharge. Patients were reexamined at 7;

21 days and 2 months later. Patients were advised to contact us whenever they faced any problem like recurrence and wherever the recognized that the seton dropped. Complete healing was achieved in 25 cases after 6-8 weeks interval. Patients were able to return to regular work in 3-4 weeks. Incontinence was not all patients. Recurrent fistula was noted in a 2 patients only after a mean follow up of six months.

Fig. 1: Horseshoe anal fistula with hydrogen peroxide passed from one opening and comes throughout other opening.

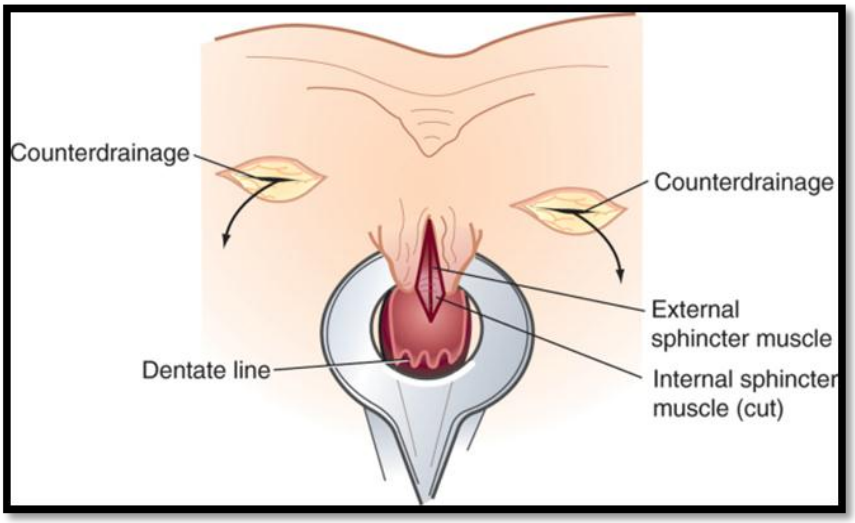

Fig. 2: Modification of Hanley's tech. for incision & drainage of horseshoe abscess

Results

Twenty eight patients presented with posterior horseshoe complex anal fistula underwent an anal fistula operation by a modified Hanley procedure during the study period. Table I summarized their characteristic. The median age was 43 years with a predominance of a male patient (20 patients, 71.4%). In 16 patients (57.1%) had undergone previous operation to treat anal sepsis, 21 patients had no previous history for surgery to treat anal fistula, whereas the rest presented with recurrent fistula. Baseline stool or gas incontinence symptoms did not seen in all patient s. Seven patients involve in this study were diabetics (25%).

Table I: Characteristics of 28 patients with posterior horseshoe anal fistula.

Characteristic	No. %
Age (range)	43 (19-73)
Gender	No. %
Male	20(71.4)
Female	8(28.6)
Duration of symptoms in weeks	28 weeks
Previous operation for anal sepsis	16(57.1)
Baseline incontinence for stool and gas	
External opening from the anal verge	
Within 3 cm	10 (35.7%)
Beyond 3 cm	18(64.3%)
Internal opening	
-at dentate line	6(21.4)
-above dentate line	22(78.6)

The majority of the patients (78.6%) had high trans-sphincteric fistula in ano and had internal opening above dentate line. The posterior midline cutting hybrid seton was tightened with average of three times accompanied by excision and curettage of the lateral tract. Most patients tolerated the tightening session with minimal analgesia that is diclofenac ampoule. It was given daily or as needed bases. Complete healing was achieved in 10-12 weeks. All patients were followed up for minimum period of six months. None of the patients had bleeding, wound infection, premature dislodgement or slippage of seton. Recurrence was found in three patients (10.7%). The causes of recurrence as shown in table II were high type horseshoe fistula, recurrent fistula and in diabetic patients.

Table II: Risk factor for recurrence

Characteristic	Recurrence(n=3)	No recurrence (n=25)
Diabetes mellitus	2	6
Previous surgery	1	19
Type of fistula		
Low	1	6
High	2	19
Type of fistula		
Primary	1	19
Recurrent	2	6
Internal opening		
-Below dentate line	0	6
-Above dentate	3	19

Table III: Wexner's score for fecal incontinence

Characteristic	Never	Rarely	Sometime	Usually	Always
Flatus	0	1	2	3	4
Liquid stool	0	1	2	3	4
Solid stool	O	1	2	3	4
Wears pad	0	1	2	3	4
Alteration in life style	0	1	2	3	4

Range (0-20); 0=normal, 20=maximum incontinence with maximal disturbance of life style.

Discussion

Fistula in ano is one of the most frequent anorectal pathologies with a spectrum of clinical presentation[5]. The route and extent of the fistulae and the associated acute suppuration are defined by the origin in the crypto glandular complex and the involvement of the anatomically circumscribed perirectal space The superficial and deep post anal space of Courtney located behind the anal canal. Both communicate on either side with ischio rectal fossa providing the pathway for the formation of horseshoe abscess and fistula[8].

Suppurative anorectal disease involving the deep post anal space comprises less than 15% of all type pf anorectal sepsis[12]. Horseshoe abscess and fistula with primary opening the posterior midline, a trans-sphincteric extension to the deep post anal space and bilateral involvement of the ischeo rectal fossa represent the most sever manifestation[13]. It remains a complex and challenging a clinical entity due to configuration, depth and the degree of the sphincter involvement. The management of the anal fistula in an effective manner has always been a challenge to the surgeon world over. The conventional operative treatment of the anal fistula is to lay open or completely excise the fistula tract and allow healing by open granulation14. In high anal fistula included horseshoe type, complete excision is not possible due to the involvement anal sphincters.

In 1965 Hanley proposed a treatment strategy for horseshoe fistula based on conventional description of post anal space of Courtney. This included bilateral para-anal incision over ishio rectal space to drain the infra levator lateral extensions of the horseshoe and packing with gauze wicks. Hanley proposed technique was a less morbid and more successful alternative to complete un-roofing which had been the standard operation at that time[15]. A decade later Hamilton published his experience with similar technique and reported 6.2% recurrence[16]. So the original Hanley procedure associated with high incidence of fecal and flatus incontinence, in 1990 notification of Hanley procedure done for management of horseshoe fistula using a hybrid seton elastic (glove seton) in order to preserve the anal sphincter and prevent the incontinence. We adapted this procedure for all our patients included in this study in management their horseshoe fistula of crypto glandular origin using a hybrid elastic seton as staged cutting seton and the surgical outcome of using this procedure during the study period from February 2007 – March 2012 were analyzed. The seton as we said fashioned from a surgical glove and was tied around the sphincter under less tension than a traditional cutting (silk) seton (Hybrid seton) and the ischiorectal space were curetted and irrigated with hydrogen peroxidase and packed with dressing soaked with povidone iodine solution 4%.

Most our patients have a history of anorectal abscess drainage or surgery for fistulae in ano. Contrary to the general believe that the horseshoe fistula is the cause of posterior deep anal abscess, fistula follows the development of deep post anal space abscess as its complication[17]. If the abscess were not drained either surgically or spontaneously, they spread extensively into the ischiorectal space[18]. This pattern of spread result in most common anterior (rare) horseshoe fistula. Incomplete or semi horseshoe fistula develops when one arm of the horseshoe abscess spontaneously drain into the skin while drainage of both arms results in a complete a horseshoe fistula.

In all patients presented in this study the presence of internal openings are in the posterior midline at the level of the dentate line dictates the presence of associated deep post anal abscess. If this abscess is not drained, the definite treatment of the fistula can be achieved, this is the most important point in the

surgical treatment of horseshoe fistula. The presence of horse shoe fistula in this study is diagnosed by history and a physical examination only. Most patients are suffering from intermittent pain and purulent ,often blood stained perianal discharge from the two external opening in the ischio rectal fossa. MRI, contrast fistulography and ultrasound of any collection of pus are used in some patients for evaluation of a complex or recurrent disease. We found that MRI is superior to contrast fistulagraphy. Beets Tan et al[18,19] evaluated the accuracy of MRI for the detection of anal fistulas and evaluated the additional clinical value of preoperative MRI, and compared with surgery done and found its sensitivity and specify for detecting horse shoe fistula tract as 100% and 100% respectively. In our study, we did not perform routine radiological study (MRI and contrast fistulography for all patients with horse shoe fistulas, since the diagnosis can be established pre-operatively by physical examination and intra-operative findings. The course of the fistula tract is confirmed by injecting hydrogen peroxide into the one of the external opening of the horse shoe fistulas. Although the passage of a probe from both the external and internal aspects is the most reliable technique to identify a fistula tract intra-operatively, injection of various substances such as methylene blue, indigo carmine, hydrogen peroxide or even milk has been described and used widely. Hydrogen peroxide is probably the best mean for identifying the internal opening, since the pressure created by the bubbles, may be sufficient to penetrate even a stenotic tract[20,21]. In our series, we cannulating the fisula tract by blind –tip probe after injecting the hydrogen peroxide is an essential step of the fistula surgery. Probing not only provide the identification of the course of the fistula tract but also facilitate the fistulotomy over the probe. Probing should be gentle, otherwise it will result in creation of a false route which further complicate the operative procedure.

Partial fistulotomy with counter –drainage of lateral tract and posterior midline incision to reach the deep post anal space is made by electrocautory. We prefer electrocoutory because it provides a better homeostasis than the traditional knife.

Controversy is still continue on the use of seton placement in the treatment of horse shoe fistula[22,23]. In our study we adapted a modified Hanley procedure for the treatment of deep post anal fistula by usage of one stage hybrid elastic glove seton. This study has shown that hybrid seton is an effective method for the treatment of complex horse shoe fistula. The median follow up period is less than one year, and the successes rate was high. There were only three cases (10.7%) of recurrence within the time of the study. Complete healing was achieved in all patients at three months post-operative period. Incontinence was not found in all patients.

The use of the hybrid seton was not associated with any significant complication or significant pain and none of the patient need narcotic analgesic after discharge. It's probable that the soft and elastic features of the seton prevent possible post-operative pain or discomfort. In addition, the simple one stage procedure adapted in this study eliminates the need for additional procedure or adjustment performed by the patients or the surgeon which inevitably bring about additional pain. The slow and stable cutting action on the sphincters eventually result in a primary fistulotomy rather than a staged procedure. A cutting seton works by slowly transecting the enclosed sphincters muscles as a result of pressure necrosis with the hope of minimal separation of the cuts ends.

In our series this slow stable and continuous cut through provided by the hybrid seton led to a high healing rate with minimal post-operative morbidity. Held et al[13], treated 69 patients for a

posterior (n=59) and anterior (n=10) horse shoe fistula by different surgical technique including incision drainage, incision and drainage with primary fistulotomy, incision and drainage with primary fistulotomy and counter drainage and incision and drainage with insertion of seton. The authors advised seton placement in the treatment of the horseshoe abscess and fistula with its better outcomes. Ustynoski et at[16] performed pri.mary fistulotomy and counter drainage in 24 patients with horse shoe fistula and reported recurrence of 28.6% with this technique .When they treated 11 patients by seton fistulotomy and counter drainage, they reduced the recurrence rate down to 18.1% and the author recommended this approach as operative procedure of choice for horseshoe abscess fistula .Pezim[12,18] reported excellent results of 24 patient who underwent unroofing the deep post anal space with division of overlying external sphincter muscle by seton for posterior horse shoe fistula. The success rate in his series was 92% with 3-5 months healing time .Recently Hammoud and coworkers[17,24] reported the use of siliastic seton which was snugly tied around the sphincter in their series of 29 patients ,healing was achieved in 100% with minor incontinence in few patients (5%). None of the patients of our study suffered permanent anal incontinence in the closed long term follow up period and we found that seton placement and counter drainage yielded excellent results without anal incontinence and with less recurrent rate and less complications.

Conclusion

Although horseshoe fistulas are not common but are challenging due to configuration and sphincter involvement .A modified Hanley procedure with drainage of the deep post anal space and usage of a cutting and draining seton proved to be safe successful and did not result in fecal incontinence. Completion of the treatment took weeks or even several months but patients remained functional even with the presence of seton in the place.

So, in this study we confirmed that the modified Hanley operation is effective and conservative surgical procedure that eliminates the disadvantage of complete unroofing and it is useful method for preservation of the sphincter function.

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