International Surgery Journal
Hareesh GSR et al. Int Surg J. 2019 Jun;6(6):2022-2027
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20192359

Original Research Article

Comparative study of manual anal dilatation and lateral internal anal sphincterotomy in the treatment of acute anal fissure

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Received: 05 May 2019
Revised: 19 May 2019
Accepted: 20 May 2019

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ABSTRACT

Background: An anal fissure is an extremely common condition which is also one of the most painful condition. It can be very troubling because, if acute, the severity of patient discomfort and extent of disability far exceed that which would be expected from a seemingly trivial lesion. This study compares two most commonly done procedures for anal fissure, manual anal dilatation (MAD) and lateral internal anal sphincterotomy (LAS).
Methods: This is a prospective cohort study comparing MAD and LAS in the treatment of chronic anal fissure at Sri Venkateswara Medical College, Tirupati, from December 2017 to December 2018. A total of 60 patients who met inclusion criteria were randomized to undergo either MAD or LAS and analyzed for post-operative pain, post-operative complications, hospital stay, recurrence rates and compliance.
Results: Total 60 patients were randomized to MAD and LAS. The patients who have undergone LAS have better pain relief and slightly increased risk of infection. Those who have undergone MAD have less risk of infection and recurrence rates and complications are not significantly less than LAS.
Conclusions: MAD and LAS are both equally effective and safe for treatment of acute anal fissure with less chances of recurrence. However postoperative pain was slightly more in MAD group.

Keywords: Manual anal dilatation, Lateral internal anal sphincterotomy, Acute anal fissure

INTRODUCTION

An anal fissure is a painful linear tear in lower end of the anal canal.[1] It is very often referred to as an ischemic ulcer. Anodermal blood flow is negatively correlated with resting pressure of anus. Increasing activity of the internal anal sphincter may decrease the anodermal blood supply by compressing the arterioles.[2]

Fissures can be classified as acute or chronic and typical or atypical.[3] Acute fissures (<6 weeks) will present with bright red bleeding with bowel movements. They will have sharp, burning, tearing anal pain or spasm. The pain can last for hours after the bowel movement. Physical findings include linear separation of the anoderm, visible with just separation of the buttocks. Posterior midline is the site of up to 90% of typical anal fissures. Remaining minority of typical fissures is found in the anterior midline. Chronic fissures (>6 weeks) will have additional physical findings of an external sentinel tag at the external apex, exposed internal sphincter muscle, and a hypertrophied anal papilla at the internal apex.[4] Typical fissures are located in the posterior or anterior midline and are not associated with other diseases.[5] Atypical fissures can occur anywhere in the anal canal. They tend to be associated with other diseases, including malignancy, Crohn's disease, human immunodeficiency virus (HIV) infection, syphilis, and tuberculosis.[6]

Pathogenesis

The exact aetiology remains uncertain. Anal fissure typically occur after the passage of a large, hard stool or anal trauma. Fissures can also occur in the absence of any trauma or constipation. Various theories have been proposed including Mechanical theory, where the anorectal angle creates the greatest stress posteriorly, Sphincter hypertonicity and Ischemia where the posterior midline is relatively ischemic by both arteriographic studies and laser Doppler.[7]

Historically, under regional or general anesthesia, manual anal sphincter dilatation is done to reduce sphincter tone and is a popular procedure in the treatment of chronic anal fissure.[8] Lateral anal sphincterotomy in which the internal anal sphincter is divided away from the fissure usually either in the right or the left lateral positions, is now current standard of care as a definitive surgical procedure.[9]

The study is aimed at comparing these two types of procedures in the management of acute fissure- in- ano in 60 patients with 30 in each limb.

METHODS

Study design: Prospective Study

Study subjects

First 60 patients of consecutive sampling who met the inclusion and exclusion criteria from December 2017 to December 2018 were selected for the study. All enrolled patients with odd number were undergone procedure 1 (MAD), even number procedure 2 (LAS).

Inclusion criteria

Patients presenting with acute typical anal fissure in Department of General Surgery, S.V.R.R.G.G.H, Tirupati and who gives a valid consent.

Exclusion criteria

Exclusion criteria were atypical fissures; patients below the age of 18 years; patients who have undergone previous anal surgeries.

Study setting

Study was conducted in the department of General Surgery, SVRRGG hospital, Tirupati.

Study period

The study was conducted for a period of one year from the time of approval of IEC.

Study methods

Detailed pre-operative evaluation of the patient and appropriate preparation for surgery. Operative findings are noted. Post-operative course, pain severity documentation with the aid of VAS score at 12 hours, 24 hours and 48 hours were evaluated. Complications are noted. Follow up is monthly once up to 6 months following surgery.

Operative procedures

Manual anal dilatation (sphincter stretch)

Sphincter stretch was originally described by Récamier in 1838 for the treatment of proctalgia fugax and for anal fissure.[10] The procedure can be carried out with a local infiltration, but a brief general anaesthetic is preferable.[11] The patient is placed in the lithotomy position. The index finger of one hand is inserted into the rectum, followed by the index finger of the opposite hand. Gentle lateral retraction with each finger commences for approximately 30 seconds. The long finger is inserted and then the other long finger. With four fingers in place, the anal canal is stretched (massaged) cautiously for 4 minutes.[11] In men, it is easier to stretch the sphincter in the anteroposterior plane because of the narrowness of the pelvic outlet. Sphincter stretch in women, however, should always be performed in the transverse plane (if undertaken at all). Narrowness is not a concern, but disruption of anterior sphincteric support is a real possibility.[12]

Lateral internal anal sphincterotomy

In 1839, Brodie was the first person to perform an anal sphincterotomy.[1] He advocated the operation for "preternatural contraction of the anal sphincter." In 1863, Hilton also suggested that the treatment for anal ulcer should be sphincterotomy. However, Miles is usually credited as the surgeon who gave the operation real credence, although Miles believed that he was dividing what he called "the pecten band." In 1951, Eisenhammer was the first person to advocate internal anal sphincterotomy for anal fissure and to truly understand which muscle he was dividing[13]. The internal anal sphincter is the continuation of the distal portion of the circular muscle of the rectum .Its length is essentially equal to that of the anal canal. Distally, it can usually be felt medial to the intersphincteric groove outside the anal verge. The subcutaneous portion of the external sphincter is lateral to the groove. The procedure of internal anal sphincterotomy has classically been performed in the posterior midline. Although this approach usually cures the condition, it is associated with the complication of the so-called keyhole deformity. Eisenhammer advocated the lateral position for sphincterotomy, dividing one-half of the muscle in an open fashion. In 1969, Notaras reported a technique using a narrow-bladed scalpel to perform an internal anal sphincterotomy in a closed fashion in the lateral position. The procedure can be performed using a

local anaesthetic (e.g., 0.5% bupivacaine in 1:200,000 epinephrine) or short-acting general anaesthetic, spinal anaesthesia, or local with conscious sedation.[14] A narrow anal retractor (e.g., Hill-Ferguson) is employed. The intersphincteric groove is usually easily felt, and the knife blade is inserted into the left lateral aspect. The tip of the blade is angled medially pointing just above the dentate line, and the lower one-third to one-half of the internal anal sphincter is divided. When the knife is seen beneath the intact anal mucosa, it is withdrawn.[15] The side of the finger is then used to break any residual sphincter fibres. If a tag or papilla is present, it can be removed by excision with scissors or electrocautery.[16-18]

Statistical analysis

The data has been entered in to MS - Excel and statistical analysis has been done by using IBM SPSS version 22.0. For categorical variables, the data values are represented as numbers and percentages. To test the association between groups chi-square test was used. For continuous variables, the data values are shown as mean and standard deviation. To test the mean difference between two groups for post-operative pain vas score at 12 hours, 24 hours and 48 hours, Mann - Whitney U test and Wilcoxon Signed Rank test was used. All the p values are having less than 0.05 are considered as statistically significant.

RESULTS

From December 2017 to December, 60 cases with chronic anal fissure were studied who got admitted to surgical units in Sri Venkateswara Ram Narain Ruia hospital. Following are the observations and results from the study

The mean±SD postoperative pain VAS score at 12 hours of MAD group [6.30±0.75] is higher than LAS group [5.23 ±0.57]. There is a significant difference between the MAD and LAS group for postoperative pain VAS score at 12 hours (p<0.0001).

The mean±SD postoperative pain vas score at 24 hours of MAD group [3.03±0.81] is higher than LAS group [2.73±0.58]. However, there is no statistically significant difference between the MAD and LAS group for postoperative pain VAS score at 24 hours (p=0.131).

Table 1: Mean differences among MAD and LAS group for post operative pain VAS score at 12 hours.

	Surgery	N	Mean	SD	z-value	P value
Postoperative pain VAS score at 12 hrs	MAD	30	6.30	0.75	-5.01	<0.0001 (very high sig.)
	LAS	30	5.23	0.57		
	Total	60	5.77	0.85		

Statistical Test: Mann-Whitney U Test.

Table 2: Mean differences among MAD and LAS group for post operative pain VAS score at 24 hours

	Surgery	N	Mean	SD	t-value	P value
Postoperative pain VAS score at 24 hrs	MAD	30	3.03	0.81	-1.51	0.131 (Not Sig.)
	LAS	30	2.73	0.58		
	Total	60	2.88	0.72		

Statistical Test: Mann-Whitney U Test

Table 3: Mean differences among MAD and LAS group for post operative pain VAS score at 48 hours.

	Surgery	N	Mean	SD	t-value	P value
Postoperative pain VAS score at 48 hrs	MAD	30	0.43	0.50	-0.257	0.797 (Not Sig.)
	LAS	30	0.47	0.51		
	Total	60	0.45	0.50		

Statistical Test: Mann-Whitney U Test.

The mean±SD postoperative pain vas score at 48 hours for MAD and LAS group is 0.43±0.50 and 0.47±0.51. However, there is no significant difference between the MAD and LAS group for postoperative pain VAS score at 48 hours (p=0.131) (Table 3).

In the MAD group, the maximum [28 (93.3%)] patients are staying less than four days in hospital and 2 (6.7%) patients are staying more than four days, whereas all 30 (100.0%) patients are staying less than four days in hospital the LAS group (Table 4).

In MAD group, 4 (13.3%) patients are having hematoma whereas in LAS group, only 1 (3.3%) patient has hematoma. However, there is no statistically significant association between Nocturnal soiling and type of surgery (p=0.161) (Table 5).

Table 4: Association between hospital stay (days) and type of surgery.

Surgery	Hospital stay (days)		%
	<4	>4	
MAD	28	2	6.7
LAS	30	0	0

Chi-Square value=2.069, p=0.150 (Not Significant)

Table 5: Association between post-operative hematoma and type of surgery.

Surgery	Hematoma		%
	No	Yes	
MAD	26	4	13.3
LAS	29	1	3.3

Chi-Square value=1.964, p=0.161 (Not Significant)

Table 6: Association between nocturnal soiling and type of surgery.

Surgery	Nocturnal soiling		%
	No	Yes	
MAD	27	3	10
LAS	29	1	3.3

Chi-Square value=1.071, p=0.301 (Not Significant)

In MAD group, 3 (10.0%) patients are having Nocturnal soiling whereas in LAS group, only 1 (3.3%) patient has Nocturnal soiling. However, there is no statistically significant association between Nocturnal soiling and type of surgery (p=0.301).

Table 7: Association between recurrence and type of surgery.

Surgery	Recurrence		%
	No	Yes	
MAD	28	2	6.7
LAS	30	0	0

Chi-Square value=2.069, p=0.150 (Not Significant)

In MAD group, only 2 (3.3%) patients are having recurrence. whereas in LAS group, no patient has recurrence. There is no statistically significant association between recurrence and type of surgery (p=0.150).

DISCUSSION

Anal fissure is a common proctologic disorder encountered in general surgical practice. Sometimes it is wrongly diagnosed as hemorrhoids and perianal fistula. It causes great discomfort and pain, despite the lesion being small in size. The perineum is an area where people may not want to mention to be sick and so patients take long time before coming to the hospital.

Medical management include topical anesthetics, glyceryl triturate, calcium channel blockers (Diltiazem), and Botulinum toxin injection.[19-21] The common surgical techniques used include, manual anal dilatation, open lateral internal anal sphincterotomy, closed internal anal sphincterotomy, posterior midline sphincterotomy, and to a lesser extent dermal flap coverage.[22,23]

60 case records of patients who presented with chronic anal fissure during the period from December 2017 to December 2018 are analytically reviewed and compared with the different series. In this study I made comparison of two operative modalities for the chronic anal fissure, manual anal dilatation and open internal anal sphincterotomy. The outcome of procedures, the advantages of lateral anal sphincterotomy and manual anal dilatation as well as the complication rates between two methods have been studied.

Duration of hospital stay

The duration of hospital stay after the procedure was also analyzed by grouping them in to two, those who stayed longer than four days and those who stayed for less than four days. In a sample of 30 patients who undergone MAD, the maximum [28 (93.3%)] patients were stayed less than four days in hospital and 2 (6.7%) patients were stayed more than four days. whereas all (100.0%) patients stayed less than four days in LAS group

Post-operative pain

Post-operative pain following surgery at 12 hours, 24 hours and 48 hours was compared with the aid of visual analogue scale (VAS). The mean±SD postoperative pain vas score at 12 hours of MAD group [6.30±0.75] is higher than LAS group [5.23±0.57]. There is a significant difference between the MAD and LAS group for postoperative pain vas score at 12 hours ($p<0.0001$). The mean±SD postoperative pain vas score at 24 hours of MAD group [3.03±0.81] is higher than LAS group [2.73±0.58]. However, there is no significant difference between the MAD and LAS group for postoperative pain vas score at 24 hours (p=0.131). The mean±SD postoperative pain vas score at 48 hours for MAD and LAS group is 0.43±0.50 and 0.47±0.51. However, there is no significant difference between the MAD and LAS group for postoperative pain vas score at 48 hours (p=0.131).

Hematoma formation

In a sample of 60 patients, only 5 (8.33%) patients were developed hematoma and 55 (91.67%) patients are not having hematoma after the surgery. In MAD type of surgery, 4 (13.3%) patients are having hematoma whereas in LAS type of surgery, only 1 (3.3%) patient has hematoma.

Nocturnal soiling

In a sample of 60 patients, 4 (6.67%) patients were experienced nocturnal soiling and 56 (93.33%) patients

are not having nocturnal soiling. In MAD type of surgery, 3 (10.0%) patients were experienced Nocturnal soiling whereas in LAS type of surgery, only 1 (3.3%) patient had Nocturnal soiling as complication.

Recurrence

In a sample of 60 patients, during the follow-up period of 6 months, 2 (3.3%) patients landed in recurrence and 58 (96.7%) patients did not develop recurrence. Patients who have undergone MAD type of surgery, 2 (6.7%) patients were landed in recurrence whereas in LAS type of surgery, no patient had recurrence. This correlate well with the studies conducted by Corman.[24]

Complication rates in manual anal dilatation were more than in lateral internal sphincterotomy. Those who underwent lateral internal sphincterotomy improved well, in terms of epithelialisation of the fissure and absence of symptoms as before. Recurrence rate in manual anal dilatation was also found to be higher than in lateral internalsphincterotomy. In manual anal dilatation the patients complicated as above and so they were to be observed longer and the complications treated. While in lateral internal sphincterotomy the complications were few.

Some of the patients who have undergone manual anal dilatation complained of a hematoma formation and nocturnal soiling. These were sorted out and led to the long stay in hospital some patients who underwent manual anal dilatation developed severe bleeding. This was because of the atony of the sphincter due to the dilatation. In lateral internal Sphincterotomy there were none who bleed. This has been shown in the western literature.[25-27] Review of the patient after four weeks follow up reflected that more complications were seen in patients who had undergone manual anal dilatation than lateral internal sphincterotomy.[13-16] Results tally well with the Western Literature that more complications are seen in manual anal dilatation.[28-31]

CONCLUSION

Acute fissure in ano is one of the common problem in general surgical practice which is commonly misdiagnosed and undertreated. Two common surgical procedures are compared in this study. Complications are seen to be more with manual anal dilatation than lateral internal sphincterotomy. These are such as haematoma formation, nocturnal soiling. Recurrence was found to be more with manual anal dilatation than open lateral internal sphincterotomy. However the results are not statistically significant to recommend one procedure as superior to other.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Hareesh GSR, Somangurthy P. Comparative study of manual anal dilatation and lateral internal anal sphincterotomy in the treatment of acute anal fissure. Int Surg J 2019;6:2022-7.