

# Comparison of Anal Manometric Pressure in patients with Chronic Anal Fissure before and after Lateral Spincterotomy

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## ABSTRACT

**Aim:** Anal fissure constitutes around 10-15% of consultation in proctology clinics. It is the most common cause of anal pain, bleeding. Lateral internal sphincterotomy is the gold standard treatment, and significant reduction in anal pressure noted among these patients

**Methods:** This study conducted in civil hospital Karachi from June 2014 to December 2015

**Results:** Total 100 patients taken including 28 females and 72 males of age 25-90 years included. Resting anal pressure was recorded about 116.0 and post-surgery anal canal pressure reduced 66.22. with significant P- value.

**Conclusion:** So, there was significant reduction in anal canal pressure measured via anal manometry. This also confirms that chronic anal fissures should be treated with lateral internal sphincterotomy.

**Keywords:** GTN: glyceryltrinitrate. MRP: maximal resting pressure. LIS: lateral internal shincterotomy

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## INTRODUCTION

Anal fissure is a benign linear ulcer in anal mucosa just distal to dentate line<sup>1</sup>. It is a painful condition and causes considerable stress in daily activities. Anal fissures are classified as: 1) Acute or superficial 2) Chronic fissure-in-ano or anal ulcer<sup>2</sup>. The exact etiology is yet to be discovered however the most probable cause may be the local trauma which leads to sphincter spasm with failure to relax, repeated episodes of hard strained defecation leads to more trauma. This leads to pain on defecation, bleeding and constipation typical of chronic anal fissure. The resting anal canal pressure is raised however it is yet to be identified whether the primary pathology leads to a raised pressure or sphincter spasm leads to a raised pressure. Chronic anal fissures represent 15% of proctologic consultations. Extensive works has already been done internationally as well as locally on efficacy of various medical treatments and on morbidity associated treatment of chronic anal fissure<sup>3,4,5</sup>. Treatment options include pharmacological and surgical means. Conventional pharmacological treatment involves the use of muscle relaxants, commonly topical and occasionally oral agents. These agents include nitrates [ISDN or glyceryltrinitrate (GTN)], calcium channel blockers, Botulinumtoxin,  $\alpha$ -adrenoreceptor antagonists,  $\beta$ -adrenoreceptoragonists and muscarinic agonists. Newer pharmacological agents being tested include Gonyautoxin, a paralytic neurotoxin derived from shellfish<sup>6</sup>. Conventional surgical therapy involves finger anal dilatation and lateral internal sphincterotomy. Finger anal dilatation is considered to be an obsolete method, as finger dilatation is associated with of anal incontinence. Lateral sphincterotomy has been regarded as the gold standard for treatment of chronic fissures. Newer surgical therapies that have evolved include local flap procedure such as V-Y advancement flaps and rotation flaps<sup>7,8</sup> Surgical Lateral internal sphincterotomy is safe

procedure with less complication and recurrence rate. It causes muscle relaxation and improved blood flow<sup>9</sup>. The ano-rectum plays an important role in regulation of defecation and in the maintenance of continence<sup>10</sup>. The most widely used test for ano-rectal function is anorectal manometry. A comprehensive assessment of anorectal function consists of measuring at a minimum each of the following parameters: (1) analsphincter function, (2) rectoanal reflex activity, (3) rectal sensation, (4) changes in anal and rectal pressures during attempted defecation, (5) rectal compliance and (6) performance of a balloon expulsion test<sup>11</sup>. Anal sphincter function is assessed by measurement of resting sphincter pressure, squeeze sphincter pressure, and the functional length of the anal canal. Maximum resting anal canal to nepredominantly reflects internal anal sphincter function, while voluntary anal squeeze pressure reflects external anal sphincter (EAS) function. Rapid distention of the rectum induces a transient increase in rectal pressure, followed by a transient increase in anal pressure associated with EAS contraction (the rectoanal contractile reflex), and in turn, a more prolonged reduction in anal pressure due to relaxation of the internal anal sphincter (the rectoanal inhibitory reflex). The recto-anal contractile reflex is a compensatory guarding mechanism that allows a positive anor-rectal pressure gradient to be maintained during transient increases in intra-abdominal pressure (such as coughing), which is essential for preserving continence. In fecal incontinence patients, anal sphincter pressure is not increased over the intra-abdominal pressure during coughing<sup>12</sup>.

We designed this study, to determine the mean change in maximal resting pressure (MRP) by anal manometry before and after lateral sphincterotomy in patients with chronic anal fissure.

## MATERIAL AND METHODS

This study conducted on 100 patients on Surgical floor unit 1 in Civil Hospital Karachi from June 2014 to December

Received on 29-10-2018

Accepted on 04-01-2019

2015. We included all patients with age ranging from 25-90 years, Patients fulfilling the operational definition of chronic fissure, and those in whom no resolution of symptoms noted in 6 months of conservative treatment. Patients having hemorrhoids, with previous anal surgery, Patients with other GI pathology, including ano-rectal malignancy were excluded. Data collected after taking approval from ethical committee, biodata of all patients with fissure coming to OPD was recorded on well-designed Performa. All patients underwent pressure measurement of anal sphincter before and 6 months after lateral sphincterotomy. Manometry was performed with the patients lying on left side. Maximum resting pressures was measured with manometry balloon applying continuous and a stepwise pull through technique, Resting pressure were again measured at 6 month of post-surgery phase.

**OPERATIONAL DEFINITION:**

**Chronic anal fissure:** Chronic anal fissure was assessed clinically by per rectal examination by naked eye presence of all of these was considered as chronic anal fissure:

- A tag of skin at the edge of the anus (sentinel pile)
- Thickened edges of the fissure with muscle fibers of the internal sphincter visible at the base of the fissure
- An enlarged anal papilla at the upper end of the fissure in the anal canal

**Statistical analysis:** We designed quasi experimental study. Data analyzed in SPSS version 20. Mean and standard deviation was calculated for age, duration of diseases, height, weight, BMI, baseline anal canal pressures and post-surgery anal canal pressures. Frequency and percentage was calculated for gender .Paired T- test was applied to compare mean difference between baseline anal pressures before and after surgery at 45 days and after 6 months of surgical procedure. P value < 0.05 is considered as significant.

**RESULTS**

In our study 100 patients with 28 females and 72 males were included, ages ranging from 25-90 years. Patients with anal fissure lasting from 6.5 to 9 months were included. Base line resting pressure of anal canal just before surgery was found high ranging from 108.22cm to 112.38cm. However post-surgery anal canal pressure reduced significantly to 64.13 to 66.45cm generally. So, there was significant drop in pressure with P value <0.05 (Table 1). Similarly in female gender out of total 28/50 patients base line anal canal pressure was 111.60 .Post surgery significant drop in anal canal pressure was 66.19 with significant p-value <0.001 (Table 1) 48/100 patients were < 40 years of age. there was significant drop of anal canal pressure noted in these patients as compared to basal anal canal pressure after surgery. Similar phenomenon seen in patients more than 40 years of age with significant p-value=0.001

**Graphical representation of gender and duration of disease:** As far as the comparison of anal canal pressure and duration of disease is concerned , Table 2.is showing these values before 7 months and after 7 months of

duration in post surgery period. In the period of less then 7 months of duration baseline anal canal pressure was noted in 90 patients , its value was111.6 cm and post surgery pressure dropped to 66.19 cm in 90 patients. P-value was also less then 0.05.

However, only 10 patients were followed up after 7months of period, base line pressure was 111.46cm, and there was persistent drop in anal canal pressure to 65.43cm even after 7 months in post-surgery phase. P-value was also seen 0.001. This indicates the accuracy of lateral sphinctrotomy

Fig. 1: Gender distribution

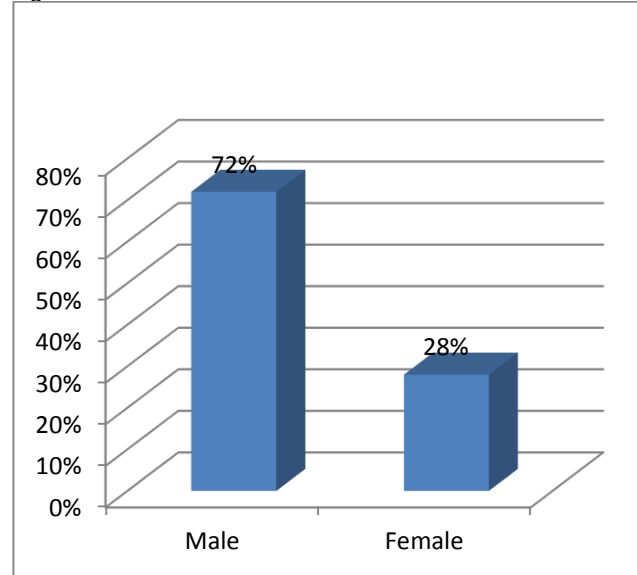
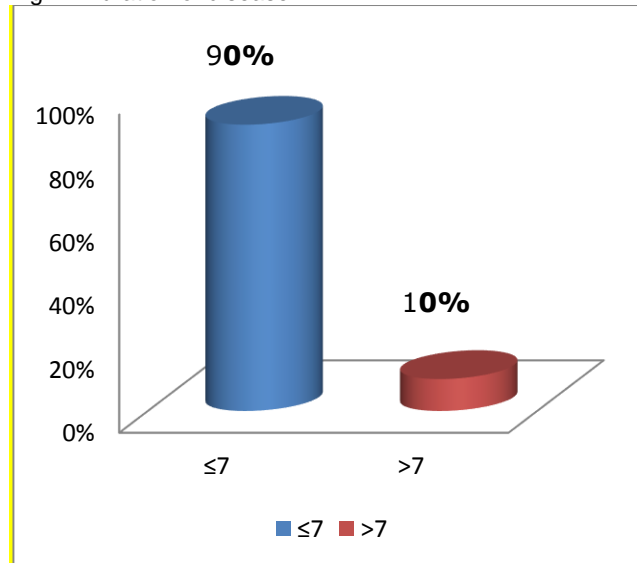


Fig. 2: Duration of disease



## Demography of patients

Characteristics	Mean±SD	P-value
Age	25-58yrs	
<b>Gender</b>		
male	72	
female	28	
Duration of primary disease	6.5-9 months (7.5±0.63)	
Base line anal canal pressure range(cm)	111.60±1.65(n=100)	
Post surgery anal canal pressure range(cm) (after 45 days)	64.13-66.45(n=100)	P=0.001
Base line anal canal pressure(cm) ge<40yrs	111.35±1.62 (48/100)	P=0.001
Post surgery anal canal pressure (cm) age<40yrs	66.13±0.76 (48/100)	
Basal anal canal pressure age>40yrs	111.84±1.2 (52/100)	P=0.001
Basal anal canal pressure age>40yrs	66.30±0.54 (52/100)	
Base line anal canal pressure range (cm) in female gender	111.77±1.38 (28/50)	P=0.001
Post surgery anal canal pressure range in female gender	66.19±0.72 (28/50)	

## Comparison of anal pressure and duration of disease in post surgery before and after 7 month phase.

< 7 months duration anal pressure	Number		P-Value
Base line anal pressure(cm)	90/100	111.6±1.49	P=0.001
Post surgery anal pressure	90/100	66.19±0.69	
<b>&gt;7 months duration anal pressure</b>			
Base line anal pressure	10/100	111.46±1.17	P=0.001
Post Surgery anal pressure	10/100	65.43±0.68	

## DISCUSSION

Chronic anal fissures represent 15% of proctologic consultations. Extensive works has already been done internationally as well as locally on efficacy of various medical treatments and on morbidity associated treatment of chronic anal fissure<sup>3-5</sup>. Lateral sphincterotomy is the proposed surgical treatment for chronic anal fissure and this procedure leads to lessening of mean resting pressures which causes an improved mucosal perfusion and reduces pain favoring quick healing. It has been reported that, pressure in the anal canal does not fall after the pain caused by the fissure has been calmed by the application of a local anesthetic to the area, which in essence suggests that the spasm may notarize secondary to pain. Lateral internal sphincterotomy is an easy procedure with satisfactory results, minimal complications and a low recurrence rate<sup>9</sup>.

McNamara et al<sup>13</sup> demonstrated that resting pressure returns to normal values after sphincterotomy. To the best of our knowledge, the present study is the first long-term manometric evaluation that describes the healing process of the internal anal sphincter over a period of 1 year following lateral internal sphincterotomy. In our study we also noted that the resting anal pressure was returning towards baseline limits, as it was noted high due to anal fissure. Currently LIS is the most commonly used surgical technique for chronic anal fissure treatment as it is associated with high healing rate and significantly improvement in patient quality of life<sup>14</sup>. It provides permanent reduction of resting pressure of the anal canal in more than 95% of the patients and the healing rate is also over 95%<sup>15</sup>. Similar results are also seen in our study. Significant fall in anal pressure was noted.

In our study highly significant mean change was found in maximal resting pressure (MRP) by manometry before and after lateral sphincterotomy in patients with chronic anal fissure. Therefore it is a safe and recommended procedure to alleviate patient's misery.

**Conflicts of interests:** All authors have declared no conflicts of interests.

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