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ORIGINAL ARTICLE

## Outcome of Chemical Versus Surgical Sphincterotomy in Patients with Chronic Anal Fissure

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### ABSTRACT

**Objectives:** To compare the outcome of chemical versus surgical sphincterotomy in patients with chronic anal fissure.

**Study Design:** Observational Comparative Study.

**Setting:** Department of Surgery, Sir Ganga Ram Hospital, Lahore.

**Subject and Methods:** 74 patients who presented with chronic anal fissure at the surgical outdoor of Sir Ganga Ram Hospital, Lahore and who met the inclusion criteria were enrolled in the study after written informed consent. Patients were randomly divided into two groups. Group-A (n=37) was subjected to chemical sphincterotomy while Group-B (n=37) underwent lateral internal sphincterotomy. Patient's demographic data along with treatment outcome was noted.

**Results:** The age of the patients ranged from 20 to 60 years with a mean age of 39.76±11.74 years in Group-A (chemical sphincterotomy) and 40.65±11.30 years in Group-B (surgical sphincterotomy). Only 29 (39.2%) patient were male while majority 45 (60.8%) patients were female. However there was no significant difference statistically between the two groups in terms of age ( $p=0.74$ ) and gender ( $p=0.81$ ). Wound healing was much better in Group-B (surgical sphincterotomy) (97.3%) as compared to Group-A (chemical sphincterotomy) (32.4%) and this difference was statistically significant ( $p=0.000$ ).

**Conclusion:** Surgical treatment in the form of lateral internal sphincterotomy is extremely effective as compared to chemical sphincterotomy in the form of 0.2% GTN in patients with chronic anal fissure.

**Key Words:** Chronic Anal Fissure, 0.2% GTN, Lateral Internal Sphincterotomy

### INTRODUCTION

Anal fissure is one of the most common differential diagnoses in the management of patients with anal pain.<sup>1</sup> The incidence of anal fissures is around 1 in 350 adults. They occur equally common in men and women and most often occur in young adults aged 15 to 40 years.<sup>2</sup> An anal fissure is a longitudinal split in the distal end of the anal canal which extends from the anal verge proximally towards, but not beyond, the dentate line. More than 90% of fissures are acute and resolve spontaneously. Acute anal fissures progress to chronic if not treated properly. About 90% of anal fissures occur in posterior midline.<sup>1</sup> Different treatment modalities have been tried, with variable degree of success in the management of acute and chronic anal fissure. These can be classified into conservative, medical (Chemical sphincterotomy: in the form of topical 0.2% Glyceryl Trinitrate) and surgical (in the form of

lateral internal sphincterotomy) management options.<sup>3</sup>

Hasmat et Al. in 2007 showed that surgical sphincterotomy was better than chemical sphincterotomy in terms of pain relief (100% vs. 57.1%) and wound healing (100% vs. 64.3%) at 6th-8th weeks after treatment. However they also observed that surgical sphincterotomy had a higher complication rate in terms of flatus incontinence (64.3% vs. none) as compared to chemical sphincterotomy.<sup>5</sup> Memon et al. in 2010 showed that surgical sphincterotomy was better in terms of wound healing (100% vs. 30.05%) as compared to chemical sphincterotomy. However they also observed that surgical treatment was associated with flatus incontinence (2.57% vs. none) as compared to chemical treatment.<sup>6</sup> Similar results have been achieved by Tauro et al. in 2011.<sup>7</sup>

So should the chemical treatment be dropped and surgical treatment be recommended to all the

Outcome of Chemical Versus Surgical Sphincterotomy in Patients with Chronic Anal Fissure

patients? Here we must not forget that though surgical treatment in the form of lateral internal sphincterotomy have shown promising results in the form of pain relief and wound healing but at the same time it is associated with fecal incontinence which although short lived, has embarrassing psychological effects. On the other hand, chemical sphincterotomy in spite of low success rate has the advantage of patient's acceptance (surgical fear) and safety (no risk of flatus incontinence). A better solution could be the medical treatment in all patients with surgery only reserved for those where medical treatment has failed. Despite a lot of international research, only limited local research (only 2 papers) is available on this topic.<sup>5,6</sup> Hashmat et al included 56 patients which were not divided randomly. Memon et al. included both acute and chronic anal fissure. We will randomly include our patients by lottery method in order to get our results without any bias. Our study will only include patients with chronic anal fissure to get more specific results.

The purpose of this study is therefore to investigate that if chemical sphincterotomy has at least comparable results along with safety, patients with chronic anal fissure should be given a trial of medical treatment before going for surgery.

**MATERIALS AND METHODS**

Study design was observational comparative study. Research was conducted at Department of Surgery, Sir Ganga Ram Hospital Lahore. 74 patients (37 in each group) were included as calculated by WHO manual with 95% confidence interval and 1% margin of error while taking expected percentage of wound healing; 100% in

Surgical and 64.3% in Chemical sphincterotomy in patients with chronic anal fissure. Patients were selected by non-probability, consecutive sampling. Patients of both sex groups with ages in the range of 20-60 years; patients having chronic anal fissure as per operational definition and patients who gave written informed consent to participate in the study were included in the study. Patients with associated ano-rectal disorders like hemorrhoids, fistula, peri-anal abscess, ulcerative colitis, Crohn's disease and rectal cancer assessed on history and clinical examination; patients with recurrence of the disease as assessed on history were excluded from study. Seventy four patients who presented with chronic anal fissure in the outdoor of Sir Ganga Ram Hospital, Lahore and who fulfilled the above criteria were counseled and explained the details of the study. Written informed consent and detailed history was taken from each patient. Patients were divided randomly into following treatment groups by lottery method. Group A was of Chemical Sphincterotomy while Group B was of Surgical Sphincterotomy. All the cases were managed by consultant in charge of the unit to eliminate bias. Patients were assessed at the end of treatment in Group A and on 3<sup>rd</sup> week post-operatively in Group B as per operational definition. Details were recorded regarding patient age, gender, treatment group, and treatment outcome. All the data was entered into the attached proforma. Confounding variables were dealt by exclusion and bias was addressed by examination and treatment from a single consultant and using lottery method for grouping of patients.

**Table 1:** Study Group Characteristics

|       |                                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------------------------|-----------|---------|---------------|--------------------|
| Valid | Group A: Chemical Sphincterotomy | 37        | 50.0    | 50.0          | 50.0               |
|       | Group B: Surgical Sphincterotomy | 37        | 50.0    | 50.0          | 100.0              |
|       | Total                            | 74        | 100.0   | 100.0         |                    |

All the collected data was entered into SPSS version 10. Numerical variables i-e age has be presented by mean ±SD and range. Paired t-test has been applied for comparison of numerical variables. Categorical variables i-e gender and wound healing has been presented as frequency and percentage and chi-square test has been applied for comparison of qualitative variables. A p

value of <0.01 has been considered as significant. Seventy four cases meeting the inclusion criteria were enrolled into this study. The patients were randomly divided into two groups using lottery method. Group-A (n=37) was subjected to Chemical Sphincterotomy and Group-B (n=37) was subjected to Surgical Sphincterotomy as shown in table 1. The age of the patients ranged

between 20 years (minimum) to 60 years (maximum). The mean age of the patients was 39.76±11.74 years in Group-A and 40.65±11.30 years in Group-B as shown in Table 2. Only 29 (39.2%) patients were male while majority 45 (60.8%) patients were female. Gender distribution across the study groups was; Group-A (37.8% Male; 62.2% Female) and Group-B (40.5% Male;

59.5% Female) as shown in Table 3. Wound Healing was much better in Group-B (97.3%) as compared to Group-A (32.4%) as shown in table 4. Also the difference was statistically significant ( $p=0.000$ ) as shown in table 5.

**Table 2:** Descriptive Statistics for Age

|                              | N  | Minimum | Maximum | Mean  | Std. Deviation |
|------------------------------|----|---------|---------|-------|----------------|
| Group-A: Age of The Patients | 37 | 20      | 60      | 39.76 | 11.736         |
| Group-B: Age of The Patients | 37 | 20      | 60      | 40.65 | 11.304         |
| Valid N (listwise)           | 37 |         |         |       |                |

**Table 3:** Study Groups \* Gender of the Patients Crosstabulation

| Study Groups                     | Gender of the Patients |        | Total  |
|----------------------------------|------------------------|--------|--------|
|                                  | Male                   | Female |        |
| Group A: Chemical Sphincterotomy | 14                     | 23     | 37     |
|                                  | 37.8%                  | 62.2%  | 100.0% |
| Group B: Surgical Sphincterotomy | 15                     | 22     | 37     |
|                                  | 40.5%                  | 59.5%  | 100.0% |
| Total                            | 29                     | 45     | 74     |
|                                  | 39.2%                  | 60.8%  | 100.0% |

**Table 4:** Study Groups \* Wound Healing Crosstabulation

| Study Group                      | Wound Healing |       | Total  |
|----------------------------------|---------------|-------|--------|
|                                  | Yes           | No    |        |
| Group A: Chemical Sphincterotomy | 12            | 25    | 37     |
|                                  | 32.4%         | 67.6% | 100.0% |
| Group B: Surgical Sphincterotomy | 36            | 1     | 37     |
|                                  | 97.3%         | 2.7%  | 100.0% |
| Total                            | 48            | 26    | 74     |
|                                  | 64.9%         | 35.1% | 100.0% |

**Table 5:** Chi-Square Tests for Healing Rate between Groups

|                     | Value  | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------|----------------------|----------------------|
| Likelihood Ratio    | 40.124 | 1  | .000                  |                      |                      |
| Fisher's Exact Test |        |    |                       | .000                 | .000                 |

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.00.

b. Computed only for a 2x2 table

## DISCUSSION

Anal fissure is a common (1:350 adults) differential diagnosis in the management of perianal pain. When acute it usually resolves spontaneously, however it may lead to chronic anal fissure which becomes a clinical challenge in terms of management. The gold standard surgical

treatment in such patients is the lateral internal sphincterotomy. Pharmacological measures like 0.2% GTN local application has also been seen an effective alternative with the plus point of being non-invasive, cost-effective and patients acceptability. However, the only drawback of 0.2% GTN application is that it is not always effective

Outcome of Chemical Versus Surgical Sphincterotomy in Patients with Chronic Anal Fissure

and patient may linger on while finally reverting to surgical management thus proving it to be rather

expensive in such cases both due to wastage of money, time and patient's discomfort.

**Table 6:** Previously Conducted Similar Studies Involving Pakistani Population

| Author                     | Year | Population | Sample Size | Healing Rate Surgical vs. Chemical |
|----------------------------|------|------------|-------------|------------------------------------|
| Hasmat et al. <sup>5</sup> | 2007 | Pakistan   | 74          | 100% vs. 64.3%                     |
| Memon et al. <sup>6</sup>  | 2010 | Pakistan   | 342         | 100% vs. 30.05%                    |
| Samad et al. <sup>8</sup>  | 2007 | Pakistan   | 50          | 88% vs. 92%                        |
| <b>Current Study</b>       | 2014 | Pakistan   | 74          | 97.3% vs. 32.4%                    |

When compared with other similar studies done in other populations (Table 7), our results match closely with those of Richard et al.<sup>9</sup>, Mishra et al.<sup>10</sup> and Siddique et al.<sup>11</sup>.

**Table 7:** Previously Conducted Similar Studies Involving Other Population

| Author                        | Year | Population   | Sample Size | Healing Rate Surgical vs. Chemical |
|-------------------------------|------|--------------|-------------|------------------------------------|
| Tauro et al. <sup>7</sup>     | 2011 | India        | 90          | 100% vs. 86.7%                     |
| Richard et al. <sup>9</sup>   | 2000 | UK           | 90          | 92.1% vs. 27.2%                    |
| Evans et al. <sup>12</sup>    | 2001 | Australia    | 65          | 97% vs. 60.6%                      |
| Mishra et al. <sup>10</sup>   | 2005 | India        | 40          | 85% vs. 30%                        |
| Siddique et al. <sup>11</sup> | 2008 | Bangladesh   | 70          | 84.85% vs. 35.48%                  |
| Oettle <sup>13</sup>          | 1997 | South Africa | 24          | 100% vs. 83%                       |
| Moussa et al. <sup>14</sup>   | 2001 | Egypt        | 100         | 100% vs. 90%                       |
| Gouda et al. <sup>15</sup>    | 2009 | Egypt        | 80          | 97.5% vs. 85%                      |
| <b>Current Study</b>          | 2014 | Pakistan     | 74          | 97.3% vs. 32.4%                    |

Previously a number of national and international studies have compared the efficacy of these two approaches in terms of wound healing. Yet, the situation remains unclear due to contrary results among different research workers. In the present study the aim was to confirm the previously available data on effectiveness of two treatment modalities in question while strictly controlling bias by utilizing lottery method for randomization and controlling confounders by exclusion criteria. It's evident from the fact that

there is no statistically significant difference among the two groups in terms of age ( $p=0.74$ ) and gender ( $p=0.81$ ). However, the difference in terms of wound healing is statistically significant ( $p=0.000$ ).

At the moment, 3 similar studies have already been conducted in Pakistan which carry contrary results as shown in table 6. The results of our study match closely with those of Memon et al.<sup>6</sup> However they don't match with those of Hashmat et al.<sup>5</sup> and Samad et al.<sup>8</sup> Samad et al.<sup>8</sup> observed

comparatively high efficacy among chemical group as compared to surgical group which doesn't match with any of the local or international study. Therefore, the reliability of this study is questionable. Similarly the results of Hashmat et al.<sup>5</sup> are also biased due to lack of randomization among groups.

Our results are however comparable to those of Tauro et al.<sup>7</sup>, Evans et al.<sup>12</sup>, Oettle<sup>13</sup>, Moussa et al.<sup>14</sup> and Gouda et al.<sup>15</sup> as it at least confirms that surgical management is better than chemical sphincterotomy. This disparity can be explained by improper randomization (Gouda et al.<sup>15</sup>), dosage (Tauro et al.<sup>7</sup>, Moussa et al.<sup>14</sup>, Gouda et al.<sup>15</sup>), exclusion criteria (Tauro et al.<sup>7</sup>) and prolong follow up (Evans et al.<sup>12</sup>, Oettle<sup>13</sup>, Moussa et al.<sup>14</sup>, Gouda et al.<sup>15</sup>).

Thus the hypothesis made at the beginning of the study is well proved and there is statistically significant ( $p=0.000$ ) difference among the two treatment options where surgical treatment in the form of lateral internal sphincterotomy is extremely effective (97.3%) as compared to chemical treatment in the form of 0.2% GTN application (32.4%).

## CONCLUSION

Surgical treatment in the form of lateral internal sphincterotomy is extremely effective as compared to chemical sphincterotomy in the form of 0.2% GTN in patients with chronic anal fissure.

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