Role of Internal Sphincterotomy in the Treatment of Hemorrhoids: A Randomized Clinical Trial

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**Background:** Anal canal dilatation and sphincterotomy have been recommended besides hemorrhoidectomy to overcome the anal pressures in the management of hemorrhoids. The aim of this study to compare internal sphincterotomy and hemorrhoidectomy with hemorrhoidectomy alone with respect to manometric and clinical measures.

**Methods:** One hundred twenty patients with hemorrhoids were randomly assigned to receive either hemorrhoidectomy with sphincterotomy or hemorrhoidectomy alone. Anal canal pressures including mean squeeze pressure, maximal resting anal canal pressure, and mean resting anal canal pressure, were recorded by manometry before the operation. The patients were evaluated one week and two weeks after the operation clinically and three months later by manometry.

**Results:** The patients were matched with respect to age, gender, and chief complaints. The mean±SD age of the patients in hemorrhoidectomy with sphincterotomy group (A) was 43.8±14 and in hemorrhoidectomy alone group (B) was 43.94±15 years. The male to female ratio was 1.1:1. One week after the operation, there was no statistically significant differences in the frequency of postoperative complications like pain and urinary incontinence between the two groups except for fecal incontinence which was more frequent in group A. After two weeks, the same results with an acceptable improvement in fecal incontinence in group A were observed. Three months after the operation, manometry showed considerable reduction in the mean resting anal canal pressure and maximal resting anal canal pressure in group A; the mean squeeze pressure did not have any changes in either group.

**Conclusion:** We recommend sphincterotomy plus hemorrhoidectomy for patients with high anal canal pressure documented by manometry prior to the operation.

**Introduction**

A new concept of the nature of hemorrhoids has been defined in which hemorrhoids are considered as the result of downward displacement of the vascular, submucosal cushions of the anal canal. Various methods of treatment for asymptomatic patients were presented in the past. However, hemorrhoidectomy has so far been the only method for treatment of symptomatic high-grade hemorrhoids (grades III and IV). However, the high incidence of recurrence with this procedure reduces its effectiveness to some extent. One factor attributed to this high incidence of recurrence is the anal canal pressure which makes growing the idea of reducing the pressure to overcome this problem. Analy canal dilatation was first described by Lord in 1989. However, due to high incidence of uncontrolled damage to the sphincteric fibers and fecal incontinence the procedure did not gain wide acceptance. Another way to reduce the anal canal pressure is internal sphincterotomy which allows the surgeon to reduce pressure with a more graduated and reproducible fashion. However, internal sphincterotomy as...
well as hemorrhoidectomy in hemorrhoids is still a subject of controversy. Some studies report that addition of internal sphincterotomy to the routine hemorrhoidectomy is unnecessary and carries the added risk of fecal incontinence.9, 10 This study was conducted to compare the anorectal function, short-term complications and patients’ well-being in two groups of patients treated with internal sphincterotomy and hemorrhoidectomy.

Patients and Methods

In a clinical trial, 120 patients who referred to Mottahari Outpatient Clinic affiliated to Shiraz University of Medical Sciences from September 2003 through August 2004 with rectal bleeding or any history of itching, mass sensation, and discharge suspicious to hemorrhoidal disease were entered to our study. The study was approved by Shiraz University of Medical Sciences Ethics Committee. All the patients have signed an informed written consent. Hemorrhoidal disease was confirmed by clinical findings and physical examination. The patients with grades II, III, and IV were randomly divided by a nurse who was blind to the therapy and study procedure into two groups of A and B receiving hemorrhoidectomy plus internal sphincterotomy and hemorrhoidectomy, respectively. The exclusion criteria were: any history of inflammatory bowel diseases, anal canal fissure or fistula, previous hemorrhoidal surgery, fecal incontinence, immunosuppression, and recent use of anticoagulant or some other medications such as nitrate compounds or β-blockers. The patients in each group were evaluated by manometry before the operation and three months after the surgery to compare the changes in anal pressures. In patients older than 40 years, investigations also included a recto-sigmoidoscopy to confirm hemorrhoidal diseases.

The patients were placed in the prone jackknife position and the site of the operation was prepared. Under local anesthesia (i.e., 10 mL of 2% lidocaine and epinephrine 1/200,000 solution) the hemorrhoid tags were removed.

In group A, internal sphincterotomy was also performed by cutting one third of the internal sphincter by cauterization. Bleeding was controlled only with diathermy without necessity to rectal pack or sutures. In group B, only the hemorrhoidal tags were removed with the same procedure.

Anorectal manometry was performed with a water perfusion system (Medtronic Polygraph 98). Measurements were made before the operation and three months after the surgery. A bowel preparation was not routinely performed before the investigation. With the subjects in the left lateral position and flexed hips at 90 degrees, the probe was introduced into the rectum and attached to a recorder. Pressure activity was displayed and recorded on a computer. After allowing the pressures (mmHg) to stabilize for five min, the maximal anal resting pressure (MxRP), mean resting pressure (MRP), and mean squeeze pressure (MSP) were recorded at 0 to 6 cm from the anal verge.

The patients were followed one and two weeks after the operation by defined guidelines in order to detect any complications attributed to the operation and also to assess the patients' well-being. Pain, as a main preoperative discomfort in our patients, was determined using a visual analog pain scale ranging from 0 to 10. A score >7 was considered as "severe pain," a score between 4 and 7 was considered "moderate pain," and a score <4 was considered as "mild pain."

As a main goal of this research, beside clinical evaluation, anorectal manometry was done for each patient almost three months after the operation.

All data were analyzed with SPSS software. Chi-square and Student's t-test were used for comparing data. A P<0.05 was considered as statistically significant.

Results

There were 120 patients, 60 in group A and 60 in group B. Our patients were matched in regard to age, gender, and their chief complaints (Table 1).

The mean±SD age of the patients in group A was 43.8±14 and that of group B was 43.94±15.
years. The male to female ratio was 1.1:1 in both groups. The patients were evaluated in three sequences with defined guidelines.

**Clinical evaluation**

**One week after the operation**

The rate of postoperative complications is demonstrated in Table 2. Severe pain (score ≥7) as a discomfort after the operation (Table 2) was detected only in 15% (n=9) of the patients in group A and 12% (n=7) of the patients in group B after the operation. As Table 2 shows, pain relief was comparable in group A and group B (**P**=0.18). Also, there was no statistically significant differences in other findings but in fecal incontinence which was more frequent in group A (**P**=0.048). In this group, five (8%) of 60 patients developed fecal incontinence. Abscess and fistula formation were not found in any patients.

Urinary retention was the most frequent complication after pain in groups A (61%) and B (60%) (**P**=0.85). Moreover, return of bowel habit after 48 hours was comparable in both groups (**P**=0.15) (Table 2).

**Two weeks after the operation**

The same results as the previous week were observed. However, fecal incontinence remained in only two out of five patients in group A and one patient in group B. As a result, the incidence of fecal incontinence was not statistically different between the two groups following two weeks after the operation.

**Manometric evaluation**

In group A, the MRP in high pressure zone consisting of one, two, and three centimeters to the anal verge was 67.44±24, 49.55±22, and 22.55±16 mmHg, respectively. These pressures changed to 46±18, 21.77±9, and 14±6 mmHg after internal sphincterotomy. In group B, these pressures were 59.44±26, 67.60±27, and 53.8±25 mmHg before the operation, which changed to 56±38, 52.20±27 and 49±12 mmHg, respectively after the operation. According to the anal canal pressure distribution curve, the MRP in these high pressure zones showed a considerable reduction in patients who underwent internal sphincterotomy in addition to hemorrhoidectomy. The patients were also studied for any changes in MxRP and also MSP. In group A, the mean±SD MxRP and MSP was 83.96±26 and 123.10±38 mmHg, respectively before the operation. It became 68.40±19 and 113.47±42 mmHg, respectively after the operation. The pressures in group B changed from 79.19±25 and 111.11±50 mmHg to 86±37 and 137.78±40 mmHg, respectively. It clearly showed a reduction in MxRP in groups A and B. However, this reduction was only statistically significant in group A patients who underwent internal sphincterotomy (**P**=0.008). On the other hand, MSP did not show any significant changes in groups A (**P**=0.73) and B (**P**=0.12). There was no correlation between any of the measured anal canal pressures and the number of hemorrhoidal tags (**P**=0.39) (Table 3).

**Discussion**

The role of raised anal canal pressure in the pathophysiology of hemorrhoids has been the subject of much study and controversy. High anal canal pressures were documented in patients with hemorrhoids. The increasing blood flow and hypertension and also the internal sphincter overactivity were all factors attributed to this fact. Anal canal dilatation was a technique described by Lord in 1989, which was based on careful but firm

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Table 2. Postoperative complications after one week.

<table>
<thead>
<tr>
<th>Complications</th>
<th>Hemorrhoidectomy plus internal sphincterotomy (n=60)</th>
<th>Hemorrhoidectomy (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>37 (61)</td>
<td>36 (60)</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Gas incontinence</td>
<td>10 (16.6)</td>
<td>8 (13.3)</td>
</tr>
<tr>
<td>Fecal incontinence*</td>
<td>5 (8.3)</td>
<td>1 (1.6)</td>
</tr>
<tr>
<td>Return of bowel function in 48 hours</td>
<td>58 (96)</td>
<td>60 (100)</td>
</tr>
<tr>
<td>Pain</td>
<td>7 (11.6)</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>33 (55)</td>
<td>34 (56.6)</td>
</tr>
<tr>
<td>Wound bruising</td>
<td>24 (40)</td>
<td>21 (35)</td>
</tr>
<tr>
<td>Wound infection</td>
<td>4 (6.6)</td>
<td>4 (6.6)</td>
</tr>
<tr>
<td>Healing of wound</td>
<td>46 (76)</td>
<td>48 (80)</td>
</tr>
<tr>
<td>Abscess formation</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

*=the difference was statistically significant.*
dilatation of anal canal in order to reduce the anal canal pressure for management of hemorrhoids.\textsuperscript{14,15} The amount of dilatation varied and the incidence of uncontrolled damage to the internal sphincter fibers was considerable.\textsuperscript{6,7} Internal sphincterotomy was suggested by Notaras as an alternative method of treatment in 1971.\textsuperscript{16} Di Bella and Estienne in 1990 suggested that internal sphincterotomy removed pain by reduction of sphincter tonicity.\textsuperscript{17}

In this study, we have compared internal sphincterotomy and hemorrhoidectomy with hemorrhoidectomy alone based on the manometric findings as well as clinical evaluation. Manometry was performed as a safe and noninvasive method to address the question that whether there is any correlations between internal sphincterotomy, anal canal pressure, and outcome of the procedure.\textsuperscript{18-20} In the present study, the MRP showed a significant reduction in patients who underwent internal sphincterotomy while there were no significant changes in MSP, neither in internal sphincterotomy plus hemorrhoidectomy nor in hemorrhoidectomy alone groups. This finding could be explained by the external sphincter function which produces the MSP which was unchanged in this procedure.\textsuperscript{21} The patients’ well-being after the operation was comparable in both groups which was in agreement with previous surveys.\textsuperscript{6, 21 – 23}

Gas or fecal incontinence might have occurred with anal canal pressure <40 mmHg.\textsuperscript{24,25} According to the MRP in our patients, which was 49.30 mmHg after the internal sphincterotomy, fecal incontinence was not propounded for this procedure. However, some patients may develop a transient episode of fecal incontinence, mainly during the first week after the operation.\textsuperscript{26} Due to this unpredictable result, internal sphincterotomy should not be performed as a routine procedure for any patient with hemorrhoids. In other words, patients with recurrence of hemorrhoids, severe pain, prolonged constipation, or anyone with high sphincter tonicity in the digital rectal examination would be a candidate for manometric evaluation of anal canal pressure. These patients with high anal canal pressure confirmed with manometry might receive internal sphincterotomy plus hemorrhoidectomy. This concept is apart from patients with simultaneous anal canal fissure among whom internal sphincterotomy was done as a routine method of treatment.\textsuperscript{27,28}

In conclusion, we recommend internal sphincterotomy plus hemorrhoidectomy in patients with hemorrhoids. However, due to some degrees of fecal incontinence, it is better to preserve this procedure only for patients with high anal canal pressure prior to the operation. As a result, manometry would be considered as an essential part of the diagnosis of anorectal disease to select either of the treatment.

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**References**