Abdominal Myomectomy Versus Uterine Fibroid Embolization in the Treatment of Symptomatic Uterine Leiomyomas

OBJECTIVE. The purpose of this study was to compare treatment efficacy and complications of abdominal myomectomy with those of uterine fibroid embolization in women with symptomatic uterine fibroids.

MATERIALS AND METHODS. We analyzed the outcomes of 111 consecutive patients who underwent abdominal myomectomy (n = 44) or fibroid embolization (n = 67) over a 30-month period. The mean ages of the two groups were 37.7 years (range, 28–48 years) and 44.2 years (range, 31–56 years), respectively. A questionnaire and review of medical records assessed all procedure-related complications and changes in symptoms. Length of hospital stay, time until resumption of daily activities, and pain medication requirements after the procedure were also analyzed.

RESULTS. Follow-up times for the myomectomy and embolization groups were 14.6 and 14.3 months, respectively. The respective observed success rates in abdominal myomectomy and uterine fibroid embolization patients were 64% versus 92% for menorrhagia (p < 0.05), 54% versus 74% for pain (not significant), and 91% versus 76% for mass effect (p < 0.05). The complication rates were 25% (abdominal myomectomy) and 11% (uterine fibroid embolization) (p < 0.05). The respective secondary end points for the two procedures were 2.9 versus 0 days mean hospital stay, 8.7 versus 5.1 days of narcotics use, and 36 versus 8 days until resumption of normal activities. These differences were all statistically significant.

CONCLUSION. Uterine fibroid embolization is a less invasive and safer treatment option in women with symptomatic leiomyomas than myomectomy. Menorrhagia may be better controlled with embolization, and myomectomy may be a better option in patients with mass effect. Both procedures were equally effective in controlling pain.
TABLE I  Patient Characteristics Before Procedure

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Abdominal Myomectomy</th>
<th>Uterine Fibroid Embolization</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>40</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td>37.7 (range, 28–48)</td>
<td>44.2 (range, 31–56)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>22 (55)</td>
<td>52 (84)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Pain</td>
<td>26 (65)</td>
<td>34 (55)</td>
<td>NS</td>
</tr>
<tr>
<td>Mass effect</td>
<td>23 (58)</td>
<td>37 (60)</td>
<td>NS</td>
</tr>
<tr>
<td>Hematocrit (mg/dL)</td>
<td>36 (range, 27–44)</td>
<td>35.5 (range, 25–52)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean follow-up (mo)</td>
<td>14.6</td>
<td>14.3</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note.—Numbers in parentheses are percentages unless otherwise noted. NS = not significant.

Myomectomy Patients and Procedure
Complaints included menorrhagia in 22 patients (55%), pelvic pain in 26 (65%), and mass effect in 23 (58%). Myomectomies were performed through a Pfannenstiel incision; as many fibroids as possible were removed. If blood loss was considered excessive, pedunculated and small subserosal myomas were spared.

TABLE 2  Outcomes of Primary End Points Expressed as Number and Percentage of Responders Who Underwent Abdominal Myomectomy or Uterine Fibroid Embolization

<table>
<thead>
<tr>
<th>Response Category</th>
<th>Menorrhagia</th>
<th>Pain</th>
<th>Mass Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Myomectomy</td>
<td>Embolization</td>
<td>Myomectomy</td>
</tr>
<tr>
<td>6, Completely resolved</td>
<td>6 (27)</td>
<td>31 (60)</td>
<td>10 (38)</td>
</tr>
<tr>
<td>5, Significantly improved</td>
<td>8 (36)</td>
<td>17 (33)</td>
<td>4 (15)</td>
</tr>
<tr>
<td>4, Moderately improved</td>
<td>5 (23)</td>
<td>3 (6)</td>
<td>10 (38)</td>
</tr>
<tr>
<td>3, No change</td>
<td>2 (9)</td>
<td>1 (2)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>2, Moderately worse</td>
<td>1 (4.5)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1, Significantly worse</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>Successful outcome (scores 5 and 6)</td>
<td>14 (64)</td>
<td>48 (92)</td>
<td>14 (54)</td>
</tr>
</tbody>
</table>
(11%) in the embolization groups ($p < 0.05$). Complications included nonautologous blood transfusion ($n = 3$), wound infection ($n = 2$), adhesion ($n = 2$), readmission for ileus ($n = 1$), chronic pelvic pain ($n = 1$), and chronic incisional pain ($n = 1$) among the myomectomy patients. We did not examine the intraoperative conversion rate to hysterectomy in this study. Complications in the fibroid embolization group included endometritis requiring readmission for IV antibiotics ($n = 1$), readmission for pelvic pain ($n = 1$), transient numbness over the groin access site ($n = 1$), and menopause ($n = 4$). All who experienced menopause after fibroid embolization were older than 46 years. The mean hematocrit decrease in the surgical patients was 6.4 mg/dL (range, 0.9–13.5 mg/dL). Hematocrit level after the procedure was not measured in any of the fibroid embolization patients.

The results of the secondary end points are listed in Table 3. The differences between the two groups were statistically significant in all areas examined except in the number or patients undergoing secondary interventions. During the follow-up period, repeated procedures for the treatment of fibroids were performed in four (10%) of the 40 myomectomy patients and five (8%) of the 62 fibroid embolization patients. The repeated procedures were three myomectomies and one hysterectomy in the abdominal myomectomy group and three myomectomies and two hysterectomies in the embolization group.

**Discussion**

In an attempt to better define the role of uterine fibroid embolization in women with symptomatic fibroids, we retrospectively compared this procedure with the standard uterus-sparing abdominal myomectomy. On the basis of the observations of this study, women in whom menorrhagia is the dominant problem do better with fibroid embolization. Bleeding resolved in 92% of the embolization group versus 64% of the myomectomy patients ($p < 0.05$). A feasible explanation for the failure of myomectomy to
control bleeding may be that the culprit fibroid may not always be removed.

Conversely, patients with complaints about mass effect may have a better outcome with surgery than with embolization. Treatment of symptoms caused by the mass effect of fibroids was successful in 91% and 76% of myomectomy and fibroid embolization patients, respectively ($p < 0.05$). This finding is not surprising because fibroids are not physically removed with embolization. Furthermore, it may take many weeks before any significant reduction in fibroid size is realized with fibroid embolization, whereas reduction in uterine size is immediate after surgery. For the same reason, those who seek treatment of fibroids only for cosmetic reasons may not be appropriate candidates for embolization. Although on the average the volume of the fibroids decreases by 30–60% after embolization [2–4, 7], the degree of reduction varies from patient to patient and cannot be predicted. Relief of pain was similar in both groups, being successful in 54% of the surgical and 74% of the embolization patients ($p > 0.05$).

The safer nature of fibroid embolization as compared with myomectomy is reflected in the complication rates (11% vs 25%) and the data on secondary end points (Table 3). Fewer inpatient hospital days (0 vs 2.9), shorter duration of the use of narcotics for pain (5.1 vs 8.7 days), and less time until resumption of normal daily activities (8 vs 36 days) were seen with fibroid embolization as compared with myomectomy.

Another symptom that would necessitate the removal of myomas is fibroid-related infertility. This issue has not been well studied in the setting of fibroid embolization. Most centers (including ours) do not offer embolization as a treatment for fibroid-related infertility. However, that does not mean embolization is contraindicated in women desiring to preserve their childbearing potential. Similar fertility rates to myomectomy have been reported after fibroid embolization [8]. A small risk exists of ovarian failure after embolization; however, failure occurs mainly in women older than 45 years [9, 10].

The cumulative probability of recurrence of fibroids after myomectomy increases with time and has been reported to be 27–51% [11, 12]. In a study of outcome and resource use associated with myomectomy, Subramanian et al. [13] reported repeated surgeries in 16.5% of women within 2 years of myomectomy; others have reported rates as high as 50% [14]. Among our patients who had abdominal myomectomy, the incidence of recurrence of fibroids is not known because few had imaging follow-up. However, the number of repeated surgeries after myomectomy for recurrence of symptoms (10%) was lower than that in other studies. The efficacy rates of 54% and 64% for pain and bleeding after surgery were also lower than in some previous reports [15]. Similar discrepancies were also observed in the embolization group. Our embolization results in controlling menorrhagia paralleled those in published series [2–5, 7], but successful outcome was achieved in fewer patients in the pain and mass effect categories than in those reports. One explanation of these discrepancies might be that our study was a symptom-specific analysis evaluating changes in each one of the fibroid manifestations separately, whereas other studies grouped the symptoms together in their analyses. Furthermore, only scores of 5 or 6, corresponding to significant improvement or complete resolution of symptoms, were considered successful. Those who had moderate improvement were not included in the calculations of treatment success. Therefore, our strict definition of treatment success, our relatively short follow-up time, and our potential population differences from other studies may explain the differences in our outcomes and those of others for both groups.

The limitations of our study stem mainly from its retrospective nature. The search for the abdominal myomectomy group yielded only those patients who actually underwent (rather than those who were planned to undergo) myomectomy. The reason for this is that we searched for the term “abdominal myomectomy” in the surgical logs of the gynecology department, which document only the performed surgeries and not the intended ones. The intraoperative conversion rate to hysterectomy is therefore not known. This fact would underestimate the complications in the myomectomy patients by about 2–3.7%, which is the estimated rate of intraoperative conversion of myomectomy to hysterectomy [13, 14]. Another problem with our study design is the potential inability of patients to accurately recall details such as the length of time taking pain medication or until resumption of normal daily activities. Because we had a similar follow-up time for both groups, however, the likelihood of this type of error should be the same for both groups. We have found that the data collected prospectively in patients who have had fibroid embolization since the termination of this study are similar to the data obtained here, which suggests that the error introduced by inaccurate recall is not likely to be significant. Furthermore, duration of recuperation reported by our abdominal myomectomy patients was consistent with that for most laparotomies reported previously [16]. Finally, the differences, such as the mean age, between the two groups studied could introduce a bias into the results.

The preliminary data presented here suggest that fibroid embolization is safer than abdominal myomectomy and has a shorter recovery time. Efficacy for the treatment of menorrhagia appears to be greater with embolization; conversely, surgery may be a better choice for symptoms stemming from the mass effect of fibroids. Factors that should affect the choice of treatment in women with symptomatic uterine fibroids include the chief complaint, anatomic variables such as number and location of fibroids, patient expectations, and treatment goals. Depending on the chief complaint and the goals of treatment, fibroid embolization should be offered as a treatment option in this patient population.
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