OUTCOMES STUDY OF NONONCOLOGICAL POST-VAESTOMY COMPLICATIONS

J. M. CHOE AND A. K. KIRKEMO
From the Department of Urology, Henry Ford Hospital, Detroit, Michigan

ABSTRACT

Purpose: We conducted an outcomes analysis to determine the incidence of post-vasectomy complications.

Materials and Methods: A questionnaire (154 questions) addressing post-vasectomy complications, incidence of post-vasectomy scrotal pain and quality of life issues was sent to 470 patients. Followup telephone surveys were made.

Results: A total of 182 patients (42.3%) responded. Mean followup was 4.8 years. The most common complication was post-vasectomy scrotal pain in 34 men (18.7%), which adversely affected quality of life in 4 (2.2%). In retrospect, 71.4% of the men were satisfied with the decision for vasectomy, 19.3% had equivocal feelings and 9.3% were dissatisfied.

Conclusions: Chronic scrotal pain is the most common post-vasectomy complication that may adversely affect quality of life in men undergoing vasectomy.

KEY WORDS: vas deferens, vasectomy, outcome assessment (health care)

RESULTS

Completed questionnaires were returned by 182 of the 470 patients (38.7%), while 40 (8.5%) were lost to followup. The remaining 248 patients (52.8%) failed to respond to the survey or telephone followup. Mean age of the 182 respondents was 40 years (range 27 to 66) and mean followup was 58 months (range 29 to 87). The 2-incision technique was used in 123 cases (67.6%) and 1 incision was used in 59 (32.4%).

Early and late complications of vasectomy are listed in table 1. The most common early complication was postoperative skin bleeding and scrotal hematoma in 23 men (12.6%). Less frequent immediate complications included superficial wound infection and wound separation. Chronic scrotal pain, the most common late complication, occurred in 34 patients (18.7%). Other delayed complications included epididymitis, spermatocele and hydrocele.

A visual analog pain scale was used to quantitate the severity of scrotal pain before and after vasectomy, with 0 indicating no and 10 severe pain. Pre-vasectomy scrotal pain, characterized as a constant dull ache, was reported by 5 patients (2.7%) (mean pain score 4), and 2 of them had new onset of post-vasectomy scrotal pain described as an intermittent dull ache (new mean pain score 6).

The effect of post-vasectomy chronic scrotal pain on men is shown in table 2. Of 34 patients with chronic scrotal pain 24 (70.6%) described the pain as an occasional discomfort that was not troublesome, while 6 (17.6%) considered it a minor nuisance. Post-vasectomy scrotal pain had an adverse impact on the quality of life in 4 of 182 men (2.2%). Two of these patients stated that the pain restricted physical activity.

TABLE 1. Early and late complications of vasectomy in 182 patients

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. Pts. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early:</td>
<td></td>
</tr>
<tr>
<td>Bleeding/haematoma</td>
<td>23 (12.6)</td>
</tr>
<tr>
<td>Superficial infection</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td>Wound separation</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>Late:</td>
<td></td>
</tr>
<tr>
<td>Chronic scrotal pain</td>
<td>34 (18.7)</td>
</tr>
<tr>
<td>Epididymitis</td>
<td>12 (6.6)</td>
</tr>
<tr>
<td>Spermatocele</td>
<td>3 (1.6)</td>
</tr>
<tr>
<td>Hydrocele</td>
<td>2 (1.1)</td>
</tr>
</tbody>
</table>

Accepted for publication October 13, 1995.
especially during ambulation, 1 experienced scrotal pain during sex, especially at ejaculation, and 1 had pain with either ambulation or ejaculation.

Minor bleeding and scrotal hematoma were treated conservatively. Appropriate antibiotics were given for superficial wound infections and wound dehiscences were treated with local wound care. Epididymitis resolved with use of local analgesics, sitz baths, scrotal support and oral antibiotics. One patient underwent hydrocelectomy for a symptomatic hydrocele. Clinically asymptomatic spermatoceles and hydroceles were treated expectantly. Post-vasectomy scrotal pain resolved after excision of a painful sperm granuloma in 1 patient.

Of the 182 patients studied 140 responded to the question regarding satisfaction with the vasectomy decision, while 42 were lost to followup. Of the respondents 100 (71.4%) were satisfied with the choice of vasectomy, 27 (19.3%) were undecided and 13 (9.3%) were dissatisfied. Of the 13 dissatisfied patients 10 cited chronic scrotal pain as the reason for regrettting the decision to undergo vasectomy, while 3 voiced concerns about the potential association between vasectomy and prostate cancer.

**DISCUSSION**

Early postoperative vasectomy complications are relatively minor. The early complication rates in our series are similar to those in the literature. Barnes et al reported that 271 patients who underwent vasectomy 15% had hematoma and 4.4% had wound infection. Esbo et al performed 400 consecutive bilateral vasectomies with 2.3% and 4.5% incidences of hematoma and wound infection, respectively. Schmidt and Free analyzed 3 groups of patients whose vas ends were either ligated, or cauterized with a monopolar or bipolar electrode. Of the 288 patients who underwent ligation 1.4% had hematoma and 4.2% had infection, compared to 0.4 and 1.3%, respectively, of 1,600 treated with monopolar cautery, and 0.2 and 1.3%, respectively, of 1,000 treated with the bipolar electrode.

Chronic scrotal pain is a late complication of vasectomy. Previous series reporting post-vasectomy complications did not mention chronic scrotal pain. However, in other reports pain was referred to as post-vasectomy orchialgia, epididymitis-orchitis, and the late post-vasectomy syndrome. The incidence of chronic scrotal pain varied widely from 0.9 to 54%, depending on the series. Massey et al reported on a cohort of 10,590 vasectomized men and found that the incidence of epididymitis-orchitis increased from 0.9% within the first 12 months to 1.8% after 12 months. Schmidt noted that 85 of 154 men (54%) with post-vasectomy sperm granulomas complained of localized testicular pain that occurred during sexual excitement and was exacerbated with ejaculation. This steady, severe ache sometimes persisted after ejaculation. Some patients avoided sexual intercourse because of fear of pain. McMahon et al conducted a questionnaire survey of 172 patients 4 years after vasectomy and 33% experienced chronic testicular pain described as a dull ache by some and as a sharp severe pain by others. Usually the pain was unilateral and intermittent. Further, more, 5% of the patients noticed testicular pain during sexual intercourse.

The pathophysiological mechanism leading to chronic scrotal pain is controversial and appears to be due either to a long-standing obstruction from ligation of the proximal vas or a sperm granuloma at the vasectomy site. Selikowitz and Schned believed that post-vasectomy pain was due to chronic obstruction of the proximal vas deferens. Vasal obstruction results in build up of epididymal back pressure and subsequent dilatation of the epididymal ducts. Ductal dilatation may be marked, even leading to the development of cysts. Pathologically, a combination of tubular dilatation, sperm packed tubules, sperm extravasation with sperm granulomas and a relative lack of inflammatory cells characterize the post-vasectomy syndrome. Jarow et al examined testicular biopsy specimens from 31 men undergoing vasovasostomy. Morphometric analysis revealed a 100% increase in seminiferous wall thickness, a 50% increase in the mean cross-sectional area and focal interstitial fibrosis in 23% of the post-vasectomy specimens. Jarvis and Dubbins evaluated ultrasonographic changes in the testis and epididymis of 31 men before and after vasectomy. Although the testicular parenchyma appeared normal, 3 epididymal changes were consistently noted: 1) a significant increase in size, 2) the development of cysts and 3) an inhomogeneous echo pattern.

In contrast, Schmidt hypothesized that a sperm granuloma at a vasectomy site is the source of chronic testicular pain. He reported that there are 2 types of sperm granulomas, asymptomatic and symptomatic. Asymptomatic granulomas (vasitis nodosa) are due to a small, minor and nonprogressive leakage of sperm, and are asymptomatic because they have an epithelial lining with no evidence of an inflammatory process. It is theorized that symptomatic (painful) granulomas are surrounded by a wall of inflammatory cells. Schmidt hypothesized that a branch of a nerve (internal spermatic, external spermatic or vas deferens) becomes incorporated within the wall of the granuloma. Thus, any stimulation of the nerve, such as compression due to a touch or cremasteric reflex, distention from ejaculation or inflammatory processes, may cause acute pain at that site. Symptoms are relieved after excision of the granuloma and fulguration of the vesal mucosal end.

The type of surgical technique used appears to influence the incidence of chronic scrotal pain. Schmidt and Free reported a 5.6% incidence of congestive epididymitis in 288 patients with ligation of the testicular and prostatic ends, 3.8% in 1,600 with bipolar cautery of the 2 vasal ends and 2.8% in 1,000 with monopolar cautery of both vasal ends. It appears that the intraluminal red-hot wire cautery with vasal ends and compression may be marked, even leading to the development of cysts. Pathologically, a combination of tubular dilatation, sperm packed tubules, sperm extravasation with sperm granulomas and a relative lack of inflammatory cells characterize the post-vasectomy syndrome. It is hypothesized that symptomatic (painful) granulomas are surrounded by a wall of inflammatory cells. Schmidt hypothesized that a branch of a nerve (internal spermatic, external spermatic or vas deferens) becomes incorporated within the wall of the granuloma. Thus, any stimulation of the nerve, such as compression due to a touch or cremasteric reflex, distention from ejaculation or inflammatory processes, may cause acute pain at that site. Symptoms are relieved after excision of the granuloma and fulguration of the vesal mucosal end.

**TABLE 2. Effect of chronic scrotal pain on quality of life in 34 men after vasectomy**

<table>
<thead>
<tr>
<th>Chronic Scrotal Pain</th>
<th>No. Pts. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occasional discomfort (not troublesome)</td>
<td>24 (70.6)</td>
</tr>
<tr>
<td>Minor nuisance</td>
<td>6 (17.6)</td>
</tr>
<tr>
<td>Neg. quality of life:</td>
<td></td>
</tr>
<tr>
<td>Pain during sex</td>
<td>4 (11.8)</td>
</tr>
<tr>
<td>Pain during ambulation</td>
<td>2 (5.9)</td>
</tr>
<tr>
<td>Pain during sex or ambulation</td>
<td>1 (2.9)</td>
</tr>
</tbody>
</table>
scalpel vasectomy technique, developed in 1974 by Li in China, is presumed to be less invasive and may have less complications. Liu and Li reported complication rates of 0.4% for the no scalpel vasectomy technique and 3.1% for the conventional method. More than 70% of patients undergoing no scalpel vasectomy experienced less pain than those undergoing the conventional technique. Using the no scalpel vasectomy technique in 179,741 Chinese patients, Li et al reported 0.09% hematomas and 0.91% infections. Of 238 American patients undergoing no scalpel vasectomy no he reported 0.09% hematomas and 0.91% infections. Of 238 American patients undergoing no scalpel vasectomy no scalpel vasectomy technique combined with the Schmidt technique of vasal occlusion (intraluminal cautery and vasal sheath obliteration) will minimize potential post-vasectomy complications.

Chronic scrotal pain, regardless of etiology, may be treated surgically if maximal conservative treatments fail. Selikowitz and Schned treated 18 patients who experienced chronic unremitting epididymal pain and induration 5 to 7 years after vasectomy. Having failed conservative measures, 17 of these 18 patients underwent either total unilateral or bilateral epididymectomy with complete resolution of symptoms, usually within 24 hours. Shapiro and Silber evaluated 9 vasectomy patients with chronic orchialgia and pain localized to the epididymis, 7 of whom did not have sperm granulomas at the vasectomy site. Vasovasostomy resulted in relief of pain in 6 patients without sperm granuloma, whereas excision of sperm granuloma relieved pain in 2.

CONCLUSIONS

Bilateral vasectomy has become the most common operation performed in men after circumcision. Vasectomy remains a leading cause of urological litigation. In our study chronic scrotal pain was the most frequently reported complication of vasectomy with an incidence of 18.7%. Pain adversely affected quality of life in 2.2% of our study population. A review of the literature would suggest that techniques in which the epididymal vas is not ligated can reduce the incidence of post-vasectomy scrotal pain. Regardless of the technique used, the high litigation potential of this procedure warrants thorough counseling of factors that may affect quality of life.

REFERENCES