

Epididymectomy for Post-vasectomy Pain: Histological Review

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Summary—Fifteen epididymectomies were performed on 10 patients with post-vasectomy pain and 12 specimens were available for histopathological review. The findings were compared with those in 2 groups in which epididymectomy was performed for chronic epididymo-orchitis and epididymal cysts. The results showed that 50% of the post-vasectomy group were cured by simple epididymectomy. Pathological findings revealed features of long-standing obstruction and interstitial and perineural fibrosis which may have accounted for the pain. It is important to recognise this late complication of vasectomy and, if surgery is to be performed, to include all of the distal vas and previous vasectomy site in the excision.

Vasectomy is a common operation which has few complications and is almost always carried out for contraceptive purposes. Esho *et al.* (1973), in reviewing 400 consecutive vasectomies, reported an early complication rate of 12.85% and a late complication rate of 4.3%. Most of these complications were trivial and resolved either spontaneously or with simple treatment; 3% of the subjects developed a tender lump at the vasectomy site. Testicular or epididymal pain following vasectomy is less common and has been attributed to infection, testicular engorgement due to blockage of sperm transport, extravasation of sperm with sperm granuloma formation, and trapping of nerves in ligatures. The term "late post-vasectomy syndrome" has been coined for the unremitting pain due to long-standing obstruction following vasectomy (Selikowitz and Schned, 1985).

The majority of patients with testicular or epididymal pain following vasectomy settle with conservative management. However, the pain persists in a small number despite treatment with antibiotics and non-steroidal anti-inflammatory drugs. Many patients are satisfied by reassurance that it is nothing serious, but in those in whom the symptoms are severe, surgery will be required.

Excision of sperm granulomas, epididymectomy and vasovasostomy have all been recommended (Schmidt, 1979; Shapiro and Silber, 1979; Edwards and Errey, 1982; Selikowitz and Schned, 1985).

We describe the clinical results of epididymectomy in a group of patients with post-vasectomy pain operated upon over a 5-year period. The pathological findings are described and compared with those in patients who underwent the operation for pain due to chronic epididymo-orchitis or for epididymal cysts. Most of the patients with epididymal pain following vasectomy had been treated with broad-spectrum antibiotics and analgesics. Some had been cystoscoped to exclude a urinary tract abnormality as the cause.

Patients and Methods

Ten patients with post-vasectomy pain were studied (Group I). The symptoms and clinical findings were reviewed. Five underwent bilateral epididymectomy and 5 unilateral epididymectomy. Histological examination was not undertaken in 2 subjects, but 12 epididymectomy specimens were available for review from 8 patients. During this period, 14 other patients also underwent epididymectomy: 7 for pain due to chronic epididymo-orchitis despite antibiotic treatment (Group II) and 7 for epididymal cysts (Group III). Seven epididymides were

reviewed from 6 patients in the epididymo-orchitis group together with 5 epididymides from 4 patients in the epididymal cyst group.

All patients in Group I had sterile urine cultures and failed to respond to broad spectrum antibiotic treatment. Epididymectomy was performed between 6 months and 20 years (mean 7 years 7 months) after vasectomy. At operation, the epididymis was carefully dissected free from the neurovascular bundle and the epididymis and distal part of the vas deferens were excised. The previous vasectomy site was excised in only 4 cases.

Paraffin wax embedded sections were retrieved from the archives of the Department of Histopathology and reviewed. Particular attention was paid to the presence and extent of ductal dilatation and interstitial fibrosis and to the presence of so-called "brown patches" of the epididymis (Mitchinson *et al.*, 1975; Ball and Mitchinson, 1984) and of spermatic granulomas (Glassy and Mostofi, 1956).

The patients were reviewed 3 months following surgery, when evidence of persistent pain and tenderness was sought. The clinical results were graded as good when there were no residual symptoms and as poor when pain and tenderness persisted or where further surgery was required.

Results

Half of the patients in Group I complained of bilateral testicular pain and the remainder of right-

sided pain only (Table 1). The onset of pain varied from 1 month to 20 years (mean 6 years) following vasectomy and the mean duration of pain prior to epididymectomy was 18.4 months (range 6–56); 90% of the subjects complained of a constant dull ache in the scrotum and only 1 complained of constant severe pain, in this case associated with tenderness at the vasectomy site (case 4). Four had exacerbation of the pain during physical activity and 3 during sexual intercourse. All patients had a tender site and, apart from case 3, testicular and/or epididymal swelling.

Operative results

Only 5 of the 10 patients who underwent epididymectomy in the post-vasectomy group (Table 2) were considered to have had a good result. In these cases epididymectomy had been carried out between 6 months and 10 years after vasectomy. Two of these subjects had undergone bilateral epididymectomy and 3 unilateral epididymectomy. In 2, the site of vasectomy was excised with the epididymis. Of the 5 subjects with poor results, 1 (Group I, case 8) eventually underwent orchiectomy with symptomatic improvement. The remaining 4 have persistent pain despite antibiotic treatment and have been offered orchiectomy. There was no obvious association between the clinical characteristics and the outcome of epididymectomy (Tables 1 and 2).

Table 1 Clinical Features

		Patient no.									
		1	2	3	4	5	6	7	8	9	10
Side	Bilateral		•	•	•	•				•	
	Right	•						•	•		•
	Left										
Duration (months)		6	6	21	30	56	12	24	12	12	5
Onset of pain following vasectomy (years)		0.08	0.5	1	0.08	0.33	4	8	12	15	20
Nature of pain	Constant		•	•	•	•	•	•	•	•	•
	During activity	•		•		•		•			
	During intercourse	•		•						•	
Site of tenderness	Testis		•			•			•		
	Epididymis	•		•	•	•	•	•	•	•	•
	Vasectomy site				•						
Testicular swelling			•			•	•	•			
Epididymal swelling		•			•		•	•	•	•	•

Table 2 Group I. Post-vasectomy

Case no.	Age (years)	Time of surgery since vasectomy (years)	Side	Histology	Ductal dilatation	Interstitial fibrosis	"Brown patch"	Spermatoc granuloma	Clinical result	Comment
1	33	0.5	Rt	Yes	+	0	0	0	Good	
2*	53	1	Bil	Yes Rt Lt	+	+	0	0	Good	
3	43	1.9	Bil	Yes Rt Lt	+	+	+	+	Poor	Vasitis nodosa. Orchiectomy offered
4*	46	2.5	Bil	No	N/A	N/A	N/A	N/A	Poor	Orchiectomy offered
5	39	5	Bil	Yes Rt Lt	+	+	+	0	Good	
6*	35	5.8	Rt	No	N/A	N/A	N/A	N/A	Good	Previous excision of sperm granuloma at vasectomy site
7	43	10	Rt	Yes	+	+	+	0	Good	
8	45	13	Rt	Yes	+	+	+	0	Poor	Subsequent orchiectomy
9	41	16	Bil	Yes Rt Lt	+	+	+	+	Poor	Orchiectomy offered
10*	59	20	Rt	Yes	+	+	0	0	Poor	Orchiectomy offered

* Excision of vasectomy site.

0 = None.

+ = Present.

++ = Pronounced.

N/A = Not applicable.

Six of 7 patients in the epididymo-orchitis group (Table 3) had good results. The 1 patient with a poor result required an orchiectomy and excision of residual appendages and is now symptom-free. Four of the 7 patients who underwent epididymectomy for epididymal cysts (Table 4) had epididymal pain before surgery and all 7 had no further trouble afterwards.

Histopathology observations

Pathological material was available for review from 18 of the 24 patients. In many respects the 3 groups showed similar appearances. Mild ductal dilatation and interstitial fibrosis were seen in almost all epididymides examined and affected the head (efferent ductules) and the body and tail (epididymal duct) to a similar degree (Figs 1 and 2). Two patients examined many years after vasectomy and 1 patient in each of the other groups showed pronounced dilatation and fibrosis. "Brown patches" of the efferent ductules were present in 10 of the 24 epididymides examined. The appearances resembled those already described (Fig. 3) (Mitchinson *et al.*, 1975; Ball and Mitchinson, 1984) and, although relatively more pronounced in the post-vasectomy subjects, there was no obvious association with any particular group of patients. On the other hand, spermatic granulomas were found in only a minority of cases. They were present in 3 patients in Group I (Fig. 4) and 1 in Group II. In all of these cases the spermatic granuloma was related to the epididymal duct and in 1 case (Group I, case 3) there was an additional large spermatic granuloma at the site of vasectomy. It was associated with a suture granuloma and changes compatible with those of vasitis nodosa (Civantos *et al.*, 1972). In 1 other subject (Group I case 6) there had been previous excision of a spermatic granuloma at the site of vasectomy.

Many subjects, from all groups, showed moderate to pronounced thickening of the smooth muscle coat of the epididymal duct. Where interstitial fibrosis was pronounced, particularly in the tail of the epididymis or if related to the vas deferens, it often appeared closely to envelop nerves and, in some cases, caused obvious distortion and angulation (Fig. 5).

Discussion

Epididymectomy for post-vasectomy pain appears to have only a 50% chance of producing a good clinical result. On the other hand, when carried out for pain associated with chronic epididymo-orchitis

or epididymal cysts, it is almost always completely successful. There was very little difference among the 3 groups in terms of the presence of dilated ducts and of interstitial fibrosis. However, in 2 of the long-standing cases in the post-vasectomy group these changes were particularly pronounced.

The role of spermatic granulomas in the aetiology of post-vasectomy pain is controversial. We found them to be more common in the post-vasectomy group: 3 of the 12 specimens had 1 or more and another man had had 1 excised previously from the vasectomy site. The true incidence of spermatic granuloma in these cases was probably higher, as they usually occur at the vasectomy site (Schmidt and Morris, 1973) and this was not often included in the specimen. The incidence of spermatic granuloma following vasectomy has been reported as 15 to 97% (Schmidt and Morris, 1973; Silber, 1977; Shapiro and Silber, 1979; Taxy *et al.*, 1981). In Shapiro and Silber's prospective study of 433 patients, of whom 97% were reported to have developed spermatic granulomas only 1 patient continued to complain of testicular pain and discomfort after 1 month. Schmidt (1979), on the other hand, found 54% of his patients were symptomatic with diagnosed spermatic granulomas following vasectomy and of these, 76% required surgery for relief of symptoms. Glassy and Mostofi (1956) reviewed 61 spermatic granulomas, 2 of which occurred after vasectomy, and found that 69% of their patients complained of pain and swelling.

We believe that late onset or prolonged post-vasectomy pain is due to at least 2 processes:

(i) Obstruction and dilatation of the efferent and epididymal ducts with interstitial fibrosis, as also described by Selikowitz and Schned (1985). Of 220 epididymides examined at vasovasostomy, 68% were turgid and distended, affecting mainly the caput epididymidis (Pardani *et al.*, 1976). Such epididymal swelling, which was particularly pronounced in some cases many years after vasectomy, might have a variety of potentially painful secondary effects, including pressure on local nerves and vascular stasis and congestion.

(ii) Perineural inflammation and fibrosis following rupture of ducts and extravasation of spermatozoa. This occurs especially in the tail of the epididymis and around the vas after vasectomy. In several of our patients, nerves in these areas were densely encased in fibrous tissue and many showed severe distortion and angulation. In the subject with vasitis nodosa (Group I, case 3) there was also lymphocytic infiltration around nerves, implying

Table 3 Group II. Epididymo-orchitis

Case no.	Age (years)	Duration of symptoms (years)	Side	Histology	Ductal dilatation	Interstitial fibrosis	"Brown patch"	Spermatic granuloma	Clinical result	Comment
1	45	0.2	Rt	Yes	++	++	N/A	+	Good	Chronic suppurative epididymitis and vasitis
2	48	0.25	Rt	No	N/A	N/A	N/A	N/A	Good	
3	67	0.9	Bil	Yes Rt Lt	+	0	0	0	Good	
4	36	1.1	Rt	Yes	+	+	0	0	Poor	Subsequent orchietomy and excision of residual appendages
5	51	2	Rt	Yes	+	+	0	0	Good	
6	50	2.9	Rt	Yes	+	+	+	0	Good	Diverticula of vas
7	44	3	Rt	Yes	+	+	0	0	Good	

0 = None.

+= Present.

++ = Pronounced.

N/A = Not applicable.

Table 4 Group III. Epididymal cysts

Case no.	Age (years)	Symptoms	Side	Histology	Ductal dilatation	Interstitial fibrosis	"Brown patch"	Spermatic granuloma	Clinical result
1	42	Swelling	Lt	Yes	+	+	+	0	Good
2	80	Swelling	Rt	No	N/A	N/A	N/A	N/A	Good
3	67	Pain and swelling	Lt	No	N/A	N/A	N/A	N/A	Good
4	48	Swelling	Lt	No	N/A	N/A	N/A	N/A	Good
5	66	Pain and swelling	Bil	Yes Rt Lt	+	+	+	0	Good
6	44	Pain and swelling	Rt	Yes	+	+	+	0	Good
7	55	Pain and swelling	Lt	Yes	+	+	+	0	Good

0 = None.

+= Present.

++ = Pronounced.

N/A = Not applicable.



Fig. 1 Head of left epididymis from a 43-year-old man removed 1.9 years after vasectomy. There is dilatation of an efferent ductule with mild interstitial fibrosis. (H and E $\times 70$).

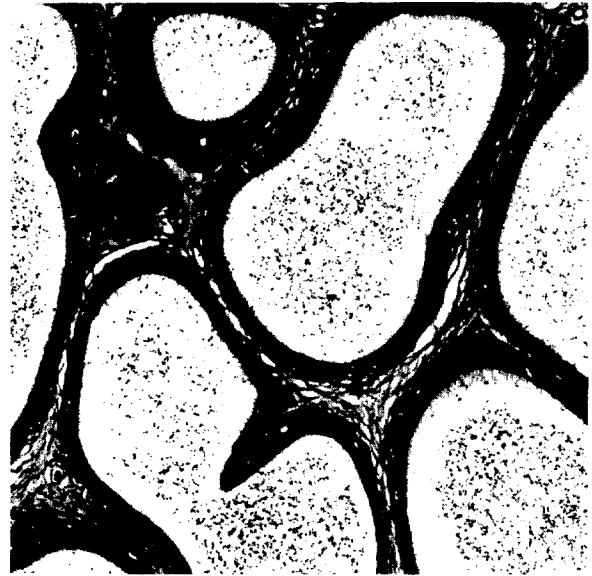


Fig. 2 Right epididymal duct removed from a 45-year-old man 13 years after vasectomy. There is pronounced ductal dilatation and interstitial fibrosis. The lumen contains degenerating spermatozoa. (H and E $\times 72$).

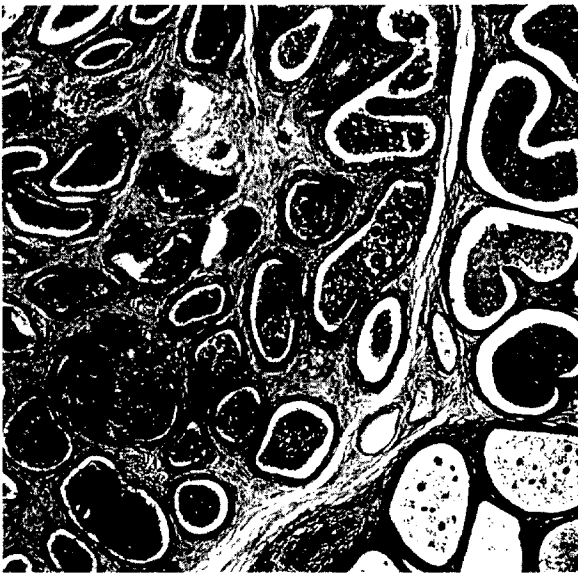


Fig. 3 "Brown patch" of the epididymis in a 45-year-old man 13 years after vasectomy. The efferent ductules are dilated and contain inspissated spermatozoa, spermatozoa and cellular debris. There is interstitial fibrosis associated with focal accumulation of inflammatory cells, including pigmented macrophages. (H and E $\times 36$).

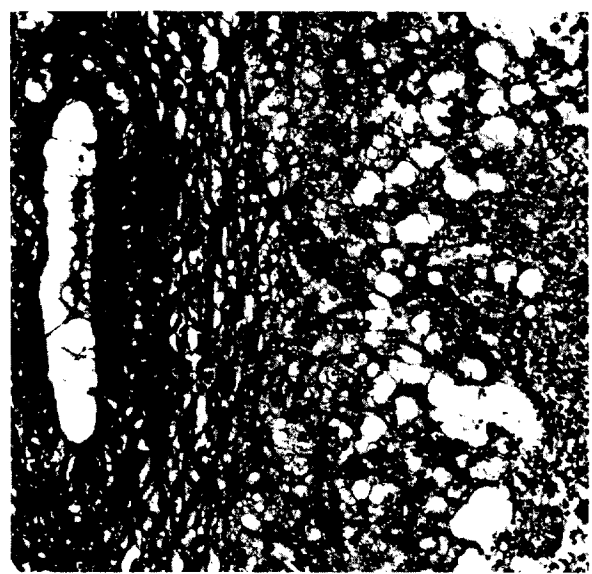


Fig. 4 Spermatic granuloma occurring in the body of the right epididymis of a 41-year-old man 16 years after vasectomy. Masses of extravasated spermatozoa (right) are bounded by a palisade of epithelioid cells and other mononuclear inflammatory cells (centre). Part of the epididymal duct is seen on the left. (H and E $\times 180$).

an ongoing chronic inflammatory process affecting these structures. Nerves may also be invaded by epithelium-lined spaces in this condition (Taxy *et al.*, 1981).

The comparatively poor results of epididymectomy after vasectomy in Group I may be related to the persistence of perineural fibrosis, since the site of vasectomy was not usually excised. This is

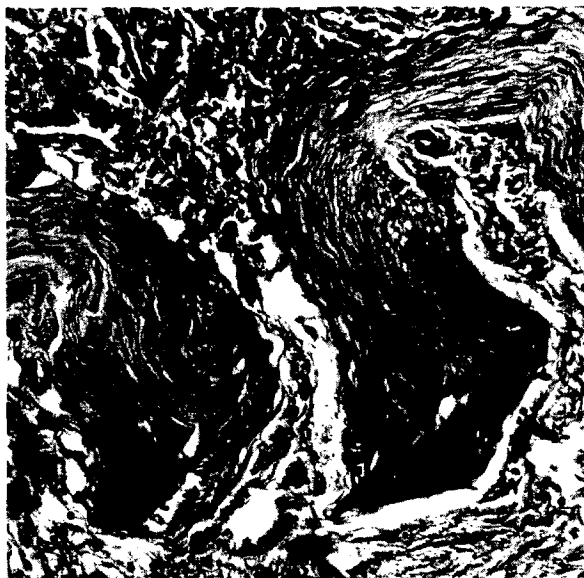


Fig. 5 Severely angulated and distorted myelinated nerves surrounded by dense fibrous tissue. In this example, removed from a 43-year-old man 1.9 years after vasectomy, there is also a dense lymphocytic infiltrate associated with the presence of vasitis nodosa and spermatic granulomatosis. (H and E \times 180).

probably why Selikowitz and Schned (1985) achieved better results, for they dissected and excised the vas deferens up to and including the previous vasectomy site. However, in 2 of our 4 patients in whom the vasectomy site was excised with the epididymis, pain persisted. Much better results were obtained from simple epididymectomy for chronic epididymo-orchitis pain. In these subjects, distortion of nerves by fibrosis was not obvious. In the patient who had a poor result, subsequent orchiectomy showed pronounced perineural fibrosis.

Persistent post-vasectomy pain is uncommon and the incidence is undoubtedly low. However, vasectomy is a very common operation (4195 vasectomies were performed in 19 vasectomy centres of the Marie Stopes Clinic in 1989; personal communication), so that a significant number of cases of persistent post-vasectomy pain will be seen in a urological practice over a period of time. It is important to appreciate the non-infective origin of this pain, to prevent lengthy treatment with antibiotics, with little improvement, for a mistaken diagnosis of "chronic epididymo-orchitis".

The pathogenesis of this condition is possibly due to a combination of perineural fibrosis and long-standing obstruction, so that simple epididymectomy, if it is performed for this condition, will

not be sufficient. We suggest that epididymectomy should be combined with excision of the whole of the distal vas up to the previous vasectomy site (including any scar tissue to be found there) if simple measures do not relieve the pain. This procedure should not be followed by the vigorous inflammation and fibrosis which may occur after vasectomy as spermatozoa would not be available locally to excite a granulomatous inflammatory process with subsequent severe fibrosis. However, even this procedure may not be successful and the patient may eventually require an orchiectomy.

Acknowledgements

We are grateful to Messrs P. T. Doyle and K. N. Bullock, Consultant Urological Surgeons, for permission to report their patients and for reviewing the manuscript.

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