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Vasectomy reversal

M R A Young, C J H Logan

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SUMMARY

A small personal series of vasovasostomies and a review of the literature on this subject are presented. The importance is stressed of good counselling before vasectomy is undertaken in the first place.

INTRODUCTION

The popularity of vasectomy is increasing, but so too is the rate of divorce and remarriage. There is also more awareness of the possibility that this operation can be reversed.

METHODS

Thirteen vasovasostomies were performed by one of the authors (HL) between 1978–1988. Follow-up information was gained by personal interview, seminal analysis, post-reversal haematological tests and case records. Three patients were not contactable due to change in address.

All operations involved bilateral identification and limited mobilization of the previously divided vas deferens. A 3/0 gauge nylon double-ended straight needle stent suture was advanced up the lumen of the proximal and distal vas for 1·5 cms and then brought through their walls. Four 6/0 nylon seromuscular sutures completed the anastomosis. The stent sutures were brought through the skin and ligated in loose loops. Patients had bed rest for two days and stents were removed on the tenth day. Seminal analyses were performed postoperatively at 1–2 months and again between 3–5 months.

In addition to seminal analysis at recent review, the Tray agglutination test[1] assessed sperm and seminal antibodies, and a complement preparation was used for sperm immobilising antibodies (positive control from Wellcome Laboratories Ltd).

RESULTS

Clinical, operative and laboratory data on the 13 patients are shown in the Table. The average age at vasectomy was 27·6 years (range 21·5 to 38 years) and at reversal 33·3 years (range 23–49 years). Four patients had vasectomy at 24 years of age or under. Remarriage following divorce was the basis for reversal in ten patients, two requested more children (vasectomy at 21 years and 24 years), and one widower was remarrying.

The Ulster Hospital, Dundonald, Belfast BT16 0RH.
M R A Young, FRCS, Registrar.
C J H Logan, FRCS, Consultant Surgeon.
Correspondence to Mr Logan.

TABLE

Clinical, operative and laboratory data on 13 patients

No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
Age at vasectomy	24	26	38	23	21	28	33	32	26	30	27	22	28
Age at reversal	27	30	49	30	23	31	43	36	30	36	29	36	33
Interval (years)	3	4	11	7	1	3	10	4	4	6	2	14	5
Operative findings													
Poor lumen	–	+	–	–	–	–	–	+	–	–	–	–	–
Convoluted	–	+	–	+	–	–	–	+	–	–	–	–	–
Laboratory data													
Sperm counts ($X10^6$/ml)													
Initial	7	nil	20	4·8	0·3	84	.	nil	24	.	.	138	nil
Recent	10	nil	nil	10	8	120	nil	nil	.	.	9	.	nil
Tray agglutination test	–ve	–ve	–ve	–ve	–ve	–ve	1:128	–ve	.	.	–ve	.	–ve
Successful pregnancy post-operative	0	0	N/A	0	1	0	0	0	.	.	3	.	N/A

(N/A not applicable)

Three patients, one of whom had no post-operative data, could not be contacted for the recent analysis and pregnancy information. Twelve patients had a sperm count performed initially and/or on review. Of these, eight had a positive count giving a patency rate of 66%.

Eight patients had complete data; of these three were azospermic throughout, and of the remaining five patients four had an increase in their sperm count with time. The remaining patient developed prostatitis in the interim between the tests. Two of the four azospermic patients had a poor lumen at vasovasostomy and had had vasectomy in the convoluted portion of the vas deferens. One had post-operative granuloma formation and the other had macroscopic normal anatomy.

It is difficult to assess the ultimate pregnancy rate as three patients were not contacted and two are hoping to conceive in the future. The wives of two patients have become pregnant, one before he brought any specimens for examination. Their sperm counts were eight and nine million/ml. Only one serum Tray agglutination test was positive (1:128). This patient had no sperm production, a good lumen but developed a post-operative granuloma. No immobilizing or seminal antibodies were detected.

DISCUSSION

The pathophysiological events following vasectomy are not entirely understood but back-pressure induced congestion and dilatation within the testes and

proximal vas deferens results in decreased patency and subsequent sperm counts.[2, 3] This problem is more significant as the interval between vasectomy and its reversal increases. Obstruction of more than five years is regarded as unfavourable,[4] but the patient's age is not considered relevant for success.

Despite a successful anatomical vasovasostomy, back pressure may cause epididymal sperm granuloma following tubal rupture with resultant functional failure. However, sperm granuloma, created by a continuous leakage at the vasectomy site have a beneficial pressure-releasing effect, with improved sperm quality and less dilation.[2, 5] Sperm granuloma should be proven histologically as they may be confused with suture granuloma.

Controversy exists as to the optimum method of anastomosis. Microscopic, macroscopic, and stented anastomoses are techniques advocated for vaso-vasostomy or vaso-epididymostomy. The general principle in all techniques includes limited mobilization to minimise disturbance of the blood supply, longitudinal incisions to preserve the cremasteric peristalsis and an accurate leak-proof anastomosis to reduce subsequent scarring. Favourable results of 83% sperm present and 55% pregnancy rates are reported for externalized nylon stents.[6] Similar results are documented for +2·5 or +3·5 loupe magnification[7] of stenting, while Denton[8] reports 65% pregnancy rates using a stented macroscopic anastomosis and a 61% rate without stents. Canine experiments have shown that vas obstruction occurs at the stent exit and not at the anastomosis.[9]

Macroscopic techniques without stents have varying and less favourable results. This ranges from a 19% pregnancy rate in a questionnaire of urologists (1630 patients),[10] a 39% pregnancy rate[11] for a two layer anastomosis, to a 57% pregnancy rate[12] using a +2·5 loupe magnification of a one layer full thickness anastomosis. Amelar and Dubin[13] were disappointed with a 33% pregnancy rate and changed to a micro-surgical technique with 53% success rate.

An improved pregnancy rate was observed with the advent of the microscopic technique, advocated by Sibler[14] in 1975, with a pregnancy rate of 76%. Owens,[15] had comparable results (72%) from this two layer microscopic technique. Belker[14] reported a 62% pregnancy rate using a ×10 to ×20 operating microscope (10/0 mucosal and 9/0 muscular anastomosis). Generally one and two layer microscopic anastomoses have similar results: Sharlip[16] had 50% pregnancies with two layers and 52% with one layer anastomoses while Lee[3] had 52% and 50% for the same techniques. While microscopic anastomoses attain optimal anatomical results, considerable practice is required to master the operating microscope. Some feel this expertise does not necessarily impart improved results in view of reported pregnancy rates of greater than 50% for any technique and that results are more dependent on the surgeon than on technique.[17]

Absence of sperm heads or a creamy paste consistency to the seminal fluid at intra-operative examination is an unfavourable prognostic feature. Better grades of fluid are observed when sperm granuloma are present. Half of the patients azospermic at operation have a reasonable recovery. Generally, sperm counts and motility improve with time though re-exploration can be successful if secondary scarring becomes evident by diminishing sperm counts. Vasectomies performed in the convoluted portion of the vas deferens or when a long segment has been excised can make the anastomosis technically difficult.

Technique may explain patency, but a discrepancy exists between patency and pregnancy rates. Sperm reappearance is therefore not necessarily an index of fertility. An immunological basis may explain this. Sperm antibodies occur in two thirds of vasectomized men, especially when sperm granuloma are present. Most studies correlate high antibody titres with infertility. The Tray agglutinating test detects head to head sperm agglutination (IgM and IgG) which is common in vasectomy patients and rare in naturally infertile men (prostatic IgA).[18] Despite diminished fertility with serum agglutinating antibody titres of 1:64, titres of 1:256 correlate better with infertility,[18, 19] but 25% of patients still conceive with these high titres. Semen agglutinating activity and immobilizing antibodies are only detected when there are high titres of serum agglutinating antibody. Seminal agglutinating activity significantly increases after vasectomy reversal[18, 19, 20] whereas serum levels remain relatively unaltered. Pregnancy rates are reduced with seminal titres of $>1:8$ (65% to 7%[20] and 85% to 14%[19] pregnancy rates for negative and positive seminal agglutinating activity respectively). Hence seminal agglutinating activity is closely correlated with infertility. Immunosuppression by steroids is claimed to have beneficial effect in reducing antibody titres.[7, 21]

Most wives who become pregnant do so within two years. If not and the male partner appears fertile then the female's fertility should be questioned. In summary, mechanical failure results from a long interval, excessive vas excision, vasectomy in the convoluted portion, poor anastomosis, infection-induced fibrosis and anastomotic granuloma. Function failure with poor semen quality results from back pressure, injury to sympathetic fibres, sperm antibodies and low fertility of the wife.

This small study highlights the social background in our society and good pre-vasectomy counselling in Northern Ireland. Restricting vasectomy to those in their late twenties and over would further reduce reversal requests. Our study identifies no hindrance from a long period of obstruction. Only one patient had a positive antibody titre. Our technique appears correct as control samples were positive. Generally, post-reversal sperm counts were lower than would be regarded as normal but this appears to be no obstacle to conceiving. Operative findings of poor lumen, granuloma and anastomosis in the convoluted portion of the vas correlate best with poor results. It would seem reasonable practice to anastomose both vasa to double the chances of success. To reduce stent exit granuloma we suggest that a long length of stent is passed down the distal vas and brought out through one exit site on the proximal vas.

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