Audit

Vasectomy management in Morecambe Bay NHS Trust

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Introduction: Vasectomy is a common method of contraception in the UK. However, there is a wide variation in management protocols. The aim of the present study was to identify differences within the hospitals of Morecambe Bay NHS Trust and to recommend a uniform practice.

Patients and Methods: Retrospective case notes review of 395 vasectomy procedures performed within the Morecambe Bay NHS Trust in a 1-year period.

Results: Inconsistency was found with regards to the anaesthetic technique, the vas histology request and the timing of the semen analysis. The non-compliance rate for postvasectomy semen analysis was 33.4%. The complication and failure rates were 4.04% and 0.51%, respectively. Motile sperm ($n = 4$) was submitted at an average time of 8 weeks' postvasectomy. In half of those cases, vasectomy proved unsuccessful. Immotile sperm ($n = 41$) was submitted at an average time of 9.5 weeks and, in 80% of those men, semen cleared at an average time of 15.5 weeks' postvasectomy. An azoospermic ($n = 285$) sample was submitted at an average time of 10.5 weeks. Eleven of those men submitted a second sample with immotile sperm at an average time of 12 weeks' postvasectomy and that was eventually clear at 18 weeks in the majority of cases.

Conclusions: A uniform vasectomy practice should include vasectomy under local anaesthesia if possible, no vas histology and a request for a single sample at 12 weeks. If this is clear, vasectomy should be considered successful. If any sperm are present, then a further sample should be requested at 16 weeks' postvasectomy. Immotile sperm at that time should not justify any further samples and a 'special clearance' should be issued to those men.

Key words: Vasectomy – Sterilisation – Semen analysis

Vasectomy is a common procedure of male sterilisation in the UK and world-wide. Nearly 40,000 vasectomies were performed in England and Wales in 1995–1996.¹ Recent data have shown that since 1996, the UK has been one of very few countries in which sterilisation incidence in men is greater than in women.² It is considered a reliable and safe method of contraception as it has a failure rate of less than 1% and carries a small risk of complications.³ However, there is a wide variation in the management of these patients especially with regards to the need for vas histology and the postvasectomy semen analysis (PVSA) regimen.⁴

The aim of the present study was to identify differences in the management of vasectomy patients within the three hospitals of Morecambe Bay NHS Trust and to recommend a uniform practice.

Patients and Methods

We retrospectively reviewed 395 patients' notes for vasectomy procedures performed within the Morecambe Bay NHS Trust from 1 April 2000 until 31 March 2001. Morecambe Bay NHS Trust consists of the Royal

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Lancaster Infirmary (RLI), Westmoreland General Hospital (WGH) and Furness General Hospital (FGH). Data collected included the specialty and the grade of surgeon, the type of anaesthesia used and the postoperative complications. We also recorded if the vas was sent for histology and the timing and results of PVSA. Statistical analyses were performed with the SPSS 8.0 software for Windows and $P < 0.05$ was considered as level of statistical significance.

Results

The study included 216 cases from RLI, 55 cases from WGH and 124 cases from FGH.

General surgeons performed 97% of the procedures in RLI, 64% in WGH and 94% in FGH whilst urologists carried out the rest of the procedures. Consultant surgeons within the Trust either performed or directly supervised a junior surgeon in 91% of the procedures whilst junior staff performed the remaining 9% alone.

Inconsistency was found with regards to the anaesthetic technique: 86.7% of cases at the RLI were carried out under local anaesthesia whilst 94.3% of the cases in FGH were carried out under general anaesthesia. These data are shown in Figure 1.

Vas was sent for histology in 61% of the cases in RLI, 71% of the cases in WGH whilst in only 1% of the cases in FGH.

Current practice in RLI is to request PVSA samples at 8 and 10 weeks whilst in FGH samples are requested at 10 and 12 weeks' postvasectomy. The timing in WGH is surgeon-dependent. Two consecutive azoospermic samples are required before confirmation of success of the procedure. In Figure 2, the PVSA results have been correlated with the time of submission. Most of the samples were submitted at

Figure 1 The anaesthetic technique for vasectomies.

10 and 12 weeks. A small proportion of samples with motile sperm were identified at 8 and 12 weeks.

Figure 3 shows the total number of samples submitted by each patient. The majority of patients (74.1%) submitted at least two samples but 65 patients submitted no samples and 39 patients submitted only one sample. Among those who submitted at least two samples, there were 28 patients who did not submit two consecutive azoospermic specimens. The non-compliance rate was 33.4% overall.

Postoperative complications were haematoma in 10 cases (2.53%), infection in 5 (1.26%) and postoperative bleeding in 1 case (0.25%). Only one case of haematoma

Figure 2 PVSA results correlated with the time of submission.

Figure 3 Number of semen samples provided by each patient.

necessitated re-operation for evacuation of the scrotum whilst the rest were treated conservatively. Likewise, all infections were treated conservatively. The case of postoperative bleeding was treated surgically. No differences were found in complication rates between specialities and grades of surgeons.

Failure was encountered in 2 cases (0.51%). In both cases, a first semen sample with sperm was submitted at 8 weeks and further persistent motile sperm was found in repeated postvasectomy samples for more than 16 weeks. Vas had been sent for histology in both cases but histology indicated failure only in one of them. That shows that vas histology may be invalid. In both cases, a re-operation for exploration of the scrotum was carried out and two consecutive azoospermic samples were subsequently obtained.

We tried to identify the optimal number and timing of PVSA sample submission by dividing patients into three groups according to their first semen specimen.

The first group consisted of 4 patients with motile sperm in the first sample. The average time of submission was 8 weeks' postvasectomy. Two of those cases were the above-mentioned failures whilst the rest 2 patients after repeated samples eventually submitted clear samples at 12 and 17 weeks, respectively.

A second group included 41 patients with immotile sperm in the first sample. The average time of submission was 9.5 weeks' postvasectomy. In this group, there were two patients with motile sperm in the second sample. Finally, both submitted clear samples at 15 and 24 weeks, respectively. Three of the remaining 39 patients did not submit any further samples, 7 submitted further samples all with immotile sperm in the study period and 29 eventually submitted clear samples at an average time of 15.5 weeks postvasectomy.

The last group of 285 patients submitted a clear first sample at an average time of 10.5 weeks. Among those patients, there were 11 who had a second sample with

immotile sperm at an average time of 12 weeks. Four of those did not submit any further samples whilst the rest submitted clear samples at an average time of 18 weeks' postvasectomy.

Reviewing the above observations, it seems reasonable to request a single sample at 12 weeks. If this is clear, vasectomy should be considered successful. If any sperm is present then a further sample should be requested at 16 weeks.

Only 4 of those patients who complied had persistent immotile sperm more than 16 weeks' postvasectomy. All of them submitted clear samples at an average time of 24 weeks' postvasectomy. Therefore, immotile sperm at 16 weeks should not justify for further samples.

Discussion

Vasectomy is a popular contraceptive method in the UK. However, there is no uniformity even within trusts on the management of the vasectomy patients. In a recent study, Sivardeen and Budhoo⁴ sent questionnaires to general surgeons and urologists working both within and outside the Northwest region and showed that there is a wide range of protocols used in the follow-up of patients undergoing vasectomy. Our study showed that there is a wide variation in the management of vasectomy patients within Morecambe Bay NHS Trust. The aim was to recommend a uniform practice in order to improve patients' care and potentially to reduce costs. This should not be at the expense of clinical effectiveness.

We found a wide variation in the use of histology. Traditionally, most surgeons send the vas for histological confirmation.⁴ However, histology does not allow for vas duplication or for double division of the same vas. From a medicolegal point of view, vas histology is not significant in many court cases.⁴ Negative semen analysis, of course, makes histological examination redundant. Therefore, it seems unjustified to send the vas for histology routinely. Meticulous surgical technique with precise identification of the vas is mandatory and we would recommend two separate lateral scrotal incisions in order to avoid the same vas being divided twice.

The traditional protocol for PVSA requires two consecutive azoospermic specimens at 12 and 16 weeks' postvasectomy.^{5,6} However, there remains uncertainty about the ideal timing of seminal analysis after vasectomy and many surgeons request semen submission earlier.⁴ We also found wide variation in the timing of PVSA in our Trust. Published evidence indicates that the complete disappearance of spermatozoa after vasectomy takes longer than generally believed and many authors have suggested that 16-weeks' wait should be the ideal time for PVSA.^{4,5,7} The 2002 British Andrology Society guidelines

for the assessment of PVSA also recommend that initial assessment is undertaken 16 weeks' postvasectomy.⁸

The number of specimens required to confirm success also remains controversial.^{8,9} The traditional protocols of two consecutive azoospermic samples cause inconvenience to patients of collecting and returning repeated samples and subsequently result in high non-compliance rates.¹⁰ Indeed the 33.4% non-compliance rate in our series is comparable to others.¹⁰⁻¹³ Another significant consideration is the increased cost of repeated semen analysis.

For these reasons, many authors have suggested that only one azoospermic semen sample should be adequate confirmation of the success before the use of alternative contraception is abandoned.^{4,10}

Our study shows that a single azoospermic semen sample at 12 weeks could confirm success of the vasectomy. Such a reduction of the submission time is in the patient's interest. Request of a single semen sample at 12 weeks is expected to increase compliance. Badrakumar *et al.*¹⁴ also suggested that given adequate counselling, a single semen analysis at 12 weeks is sufficient grounds for discontinuing other contraceptive precautions. If any sperm is present then a further sample should be requested at 16 weeks. Immotile sperm at that time should not justify for further samples. In our series, only 4 of those patients who complied had persistent immotile sperm more than 16 weeks' postvasectomy. All submitted clear samples at an average time of 24 weeks' postvasectomy. Sivardeen and Budhoo⁴ also suggested that immotile sperm at 16 weeks is not an indication for further semen samples. De Knijff *et al.*¹⁵ have shown that the presence or even re-appearance of immotile sperm alone should not unnecessarily prolong semen analysis. Other series also demonstrated that the presence of persistent immotile spermatozoa should not be an indication for repeating vasectomy and a 'special clearance' should be issued to those men.^{16,17}

The cessation of the practise to send the vas for histology and performance of the procedure under local anaesthesia rather than general anaesthesia would be additional methods to improve patient management and reduce costs. However, we feel that patients should be given the choice of which type of anaesthetic they have.

The complication rate and failure rate of vasectomy in Morecambe Bay NHS Trust are low and comparable to other series.^{3,10,18,19} The most important potential complications are haematoma, infection, epididymitis/epididymo-orchitis, sperm granuloma, and chronic scrotal pain. Scrotal haematoma and infection were 2.53% and 1.26%, respectively, in our series and the vast majority subsided with conservative treatment. The incidence of chronic scrotal pain was not recorded. This has been shown to be more common than previously described, affecting almost one in seven patients.¹⁹

Failure was encountered in 2 cases (0.51%). In both cases, a first semen sample with sperm was submitted at 8 weeks and further persistent motile sperm was found in repeated postvasectomy samples for more than 16 weeks. In both cases, a re-operation for exploration of the scrotum was carried out and azoospermic samples were eventually obtained. Early failure was quoted as 0.36% in a large series of Philip *et al.*¹⁸ and has been attributed to both technical failure (such as missed vasa deferentia) and early recanalisation of the vas deferens.^{11,18}

Although uncommon, re-appearance of spermatozoa in ejaculates after documented azoospermia may occur due to late recanalisation. The late failure rate has been reported to be 0.04–0.08% and is usually only discovered after pregnancy in the female partner.^{18,20} In our series, late failures have not been recorded.

All candidates for vasectomy must receive appropriate counselling regarding complications and the rare possibility of late recanalisation after clearance.⁸

Conclusions

A uniform vasectomy practice to improve patient care and potentially to reduce costs, but not at the expense of clinical effectiveness, should include vasectomy under local anaesthesia if possible, no vas histology and request of a single sample at 12 weeks. If this is clear, vasectomy should be considered successful. If any sperm is present then a further sample should be requested at 16 weeks. Immotile sperm at that time do not justify further samples and a 'special clearance' should be issued to those men.

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