CASE REPORT

Two cases of delayed patency following "failed" epididymovasostomy and subsequent percutaneous epididymal sperm aspiration

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Summary: *We describe two patients who underwent bilateral epididymovasostomy and subsequent percutaneous epididymal sperm aspiration (PESA) because of persistent azoospermia, after which sperm returned to the ejaculates of both patients, resulting in an unexpected natural pregnancy in one of the couples.*

Patients: *Two men, Patient A (age 35 years) and Patient B (age 37 years), underwent vasectomy reversal 8 and 9 years following vasectomies, respectively. In both cases, bilateral epididymovasostomy was required due to epididymal obstruction. Semen analysis was performed at 3 month intervals following the procedure. Both patients underwent PESA, and one couple completed intracytoplasmic sperm injection (ICSI).*

Findings: *In Patient A, PESA and ICSI resulted in a dizygotic twin pregnancy, which was followed by an unexpected natural pregnancy 3 years after the epididymovasostomy. Semen analysis indicated late patency. This experience prompted us to advise Patient B to continue undergoing semen analyses every 3 months, even though PESA and ICSI treatment had been initiated. One year after the reconstructive procedure, and after PESA was performed, semen analysis indicated patency. This couple has stopped ICSI treatments and is now attempting a natural pregnancy.*

Conclusions: *Epididymovasostomy may result in delayed patency and natural pregnancy, even after PESA has been performed. This finding should be taken into consideration by clinicians and by couples trying to conceive a child following "failed" epididymovasostomy and subsequent PESA.*

Key Words: epididymovasostomy, PESA, patency, pregnancy

Introduction

With the development of microsurgical techniques, vasectomy reversal by vasovasostomy or epididymovasostomy has become very effective. Patency rates following bilateral vasovasostomy approach 100%, and patency rates following epididymovasostomy are currently reported to be 80% in some centers.[1]

Although it is has been reported that patency following vasectomy reversal, especially epididymovasostomy, may take up to 2 years,[2] some couples may wish to turn to percutaneous epididymal sperm aspiration (PESA) combined with intracytoplasmic sperm injection (ICSI) sooner than that. During PESA, the man's epididymis is either punctured or microsurgically explored, to obtain spermatozoa, after which the man is deemed to be "permanently infertile."

We report on two patients who underwent bilateral epididymovasostomy but remained azoospermic. Both patients subsequently underwent bilateral PESA for later use with ICSI. Following the PESA procedures, sperm returned to the ejaculates in both patients, which led to a natural pregnancy in one of the couples.

Patients

Two patients were referred to our clinic for vasectomy reversal.

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Patient A

In 2003, when he came to the clinic, Patient A was 37 years old and had undergone a vasectomy 9 years earlier. He was now divorced and he and his new 32-year-old partner wanted to conceive a child. The patient's history and physical examination were unremarkable. His vas deferens defect was short on both sides with bilateral engorged epididymides. Exploration through a bilateral high scrotal incision was performed under general anesthesia. Microscopic examination of the vasal fluid_revealed that it was thick and white (toothpaste-like) and contained debris but no spermatozoa on both sides. The patient underwent a bilateral epididymovasostomy that was performed using a transverse two suture intussusception technique[3] with 10-0 nylon sutures on the corpus epididymis. In our centre, perioperative semen cryopreservation is not performed during epididymovasostomy, because if epididymal sperm are needed for ICSI, PESA can be performed as a relatively simple outpatient procedure, while cryopreservation is not reimbursed and thus is a costly option.

The patient's postoperative recovery was uneventful. Semen analysis 3 months after surgery revealed no sperm in the ejaculate (azoospermia). The patient's semen was subsequently evaluated every 3 months. He remained azoospermic up to and including his last semen analysis 1 year after surgery.

In 2005, the patient underwent bilateral PESA that was performed under local anesthesia using a 21-gauge butterfly needle. The needle was inserted percutaneously in the caput epididymis and aspiration was performed while the needle was repeatedly moved in a cranio-caudal direction.[4] The obtained spermatozoa were cryopreserved for later use. Following ICSI, healthy dizygotic twins were born. Three years later, however, an unexpected natural pregnancy occurred. Semen analysis now showed 48 million sperm per ml, with 46% motility (World Health Organization [WHO] grade a+b) and 1% ideal morphology (Kruger criteria). The mixed antiglobulin reaction (MAR) test was positive. At present the pregnancy is progressing well.

Patient B

Patient B, a 35-year-old man and his new 24-year-old partner were referred to our clinic 8 years after the man's vasectomy. Except for a right sided hydrocele operation, the man's history was unremarkable. Physical examination revealed high ligation of the vas deferens bilaterally, with a large defect on the right side. Exploration through a bilateral high scrotal incision was performed under general anesthesia. Microscopic examination of the vasal fluid revealed that it was thick and white (toothpaste-like) and contained debris but no spermatozoa on both sides. Bilateral epididymovasostomy was performed as described above. The patient's postoperative recovery was uneventful. Semen analysis at 3 and 6 months after surgery indicated azoospermia. The couple subsequently decided to attempt PESA and ICSI. PESA was performed as described above. Triggered by our experience with Patient A, we advised Patient B to continue having semen analyses every 3 months. At 1 year after the man's vasectomy reversal, and after bilateral PESA with cryopreservation of sperm, but before the ICSI procedure was performed, semen analysis showed 14 million sperm per ml with 7% motility (WHO grade a+b) and 2.5% ideal morphology (Kruger criteria). The MAR test was negative. The couple was informed of these findings and they are currently attempting a natural pregnancy.

Discussion

The options of vasectomy reversal or assisted reproductive techniques have resulted in high expectations in couples who wish to conceive after the male partner has undergone a vasectomy. The availability of these very different approaches requires a thorough evaluation and discussion with the couple about which path to follow.[5,6] Once a reconstructive procedure is chosen, important choices must be made at each follow up visit. Should time be given to give natural pregnancy a chance, or (in case of very poor semen quality or an unsuccessful prolonged attempt at natural conception) should assisted reproductive techniques be invoked? In the case of persistent azoospermia, should time be given to allow for a possible longer time to patency or should epididymal sperm retrieval plus ICSI be attempted? These complex problems require an understanding of pertinent clinical, economic, and other factors.

There have been a number of reports indicating that time to patency after vasectomy reversal may take many months, especially after epididymovasostomy.[2,7] Matthews et al observed a median time to patency of 3.6 months for patients undergoing bilateral epididymovasostomy.[7] At 3 and 12 months following this procedure, motile sperm were found in 30% and 49% of men, respectively. Between 12 and 24 months, another 3% of patients obtained motile sperm. A similar pattern was reported by Yang et al: 31% patency at 3 months after bilateral epididymovasostomy and

46% at 12 months after this procedure.[6] Interestingly, patency rates further increased to 62% at 24 months after the procedure, indicating that even at 1 year after reconstruction, sperm can return to the ejaculate.[6] Our policy after epididymovasostomy, based on these findings, is to counsel patients to wait at least 1 year for the reversal to "mature," and to have their semen analyzed every 3 months.

Although couples may often be content to wait for a while, sooner or later many motivated couples will turn to epididymal sperm retrieval and ICSI in their quest for a child. Traditionally, clinicians assumed that all sperm retrieval techniques were detrimental to the epididymis, as both percutaneous and microsurgical techniques would cause major trauma and presumably fibrosis with secondary obstruction. It has recently been reported, however, that PESA apparently results in minimal trauma to the epididymis and that reconstructive surgery after PESA is still feasible.[8,9] The patients described above indicate that delayed patency is still possible after bilateral epididymovasostomy, even after bilateral PESA. Presumably, puncture of the caput epididymis only, where a multitude of different tubules provide passage for post testicular sperm,[10] creates some fibrosis but does not cause obstruction of all tubules. Puncture or microscopic dissection of the corpus or cauda of the epididymis, which consist of a single highly convoluted tubule,[10] would more likely result in complete fibrotic obstruction. For our two patients this phenomenon has had great impact. Patient A wanted to conceive a child with his new partner. The twins, and especially the natural pregnancy that followed 5 years after the primary procedure, were more children that they initially wanted. Patient B now has an opportunity to pursue a natural pregnancy, perhaps obviating the burden of the ICSI procedure.

Delayed patency after PESA following epididymovasostomy is a phenomenon that has not previously been described but is important for a number of reasons. Whereas a man who remained azoospermic after vasectomy reversal and subsequently underwent epididymal sperm retrieval has traditionally been deemed "permanently infertile," this no longer appears to be always true. Patients should be informed of possible future fertility so that they can take appropriate action if, following successful assisted reproductive techniques, they do not want further children. In couples where ICSI has not (yet) resulted in pregnancy, delayed patency after PESA can have a profound impact on further treatment strategies.

Conclusions

Epididymovasostomy may result in delayed patency a year or more later, even if PESA has been performed. It is important that couples where the man has undergone epididymovasostomy receive counseling to be aware that a late natural pregnancy is possible, so that they may avoid assisted reproductive techniques or take necessary contraceptive precautions. Semen analyses should therefore be performed at regular (for example, 3 month) intervals, perhaps for up to 2 years after a "presumably failed" epididymovasostomy, to ensure an optimal reproductive strategy. □

References

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EDITORIAL COMMENT

This manuscript underscores a few important challenges for the Urologist who treats fertility issues and performs microsurgery. My fellowship director, Dr. Robert Oates, would lament that it was amazing that *any* vasovasostomy or vasoepididymostomy (V-E) worked at all, given how small the anastamosis is and how delicate and precise the suturing had to be. Nonetheless, advances in microsurgical technique have let to exceptional success rates for these procedures. A vasoepididymostomy is particularly challenging to perform, and the relative delay of sperm to the ejaculate in some successful procedures is well described. Additionally, the variable and unpredictable nature of timing of return of sperm to the ejaculate with vasoepididymostomy has been reported, and this novel description of two extremely unusual cases adds even more evidence to this finding. This may be due to prolonged edema at the anastamosis site, or simply a tenuously small anastamotic lumen that behaves erratically. In this manuscript, despite several negative semen analyses, the anastamosis proved to be sufficient to allow enough sperm to pass from time to time. Given this observation, the authors then argue that delayed PESA may be superior to what I would otherwise view as the standard of care: an epididymal or testicular sperm aspiration at the time of the initial V-E. They argue that PESA is less traumatic than the alternatives, allowing the perhaps tenuous V-E to still work in those rare but possible delayed anastamotic openings. They further argue that the delay in harvesting sperm may confer an advantage, given that it may be unnecessary altogether, but also it does not do anything to potentially disrupt the complex initial surgery. As mentioned, in nearly all cases, these connections are extraordinarily delicate. Given this small subgroup of patients described here, there is some credence to those who argue that PESA does play an important role, and reiterates just how complex and variable the vasoepididymostomy remains. We may need to council patients to not lose hope after a V-E for a much longer period that we initially thought.

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REPLY BY AUTHOR

I agree fully with the reviewer's position that vasectomy reversal, especially vasoepididymostomy (V-E), is not only a technically challenging procedure, but that its sequealae with respect to time to patency and possible conception, are often difficult to predict making counseling a delicate matter. In addition to these physiological uncertainties one must also include practical information including local law, insurance contracts and hospital facilities. In The Netherlands, elective (non oncological) cryopreservation of semen is not reimbursed and would thus amount to a large financial burden. Most patients therefore elect not to preserve their semen and prefer, if necessary, percutaneous epididymal sperm aspiration (PESA), a minimally invasive outpatient procedure under local anesthetic. In a situation where facilities and finances pose no impediment, collection and preservation semen during V-E is an elegant and non traumatic approach as semen can be harvested when the epididymal tubule is microdissected and opened prior to anastomosis with the vas deferens. I would thus not venture to suggest that PESA is superior to sperm aspiration at the time of initial surgery. I was until recently actually quite certain that the trauma and subsequent fibrosis caused by PESA would preclude any chance of subsequent sperm passage through the seminal tract. The two patients described above show that this is apparently not always the case, perhaps requiring us to adjust the information we provide to couples when they consider PESA accordingly.

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