

Sperm Cryopreservation in the Teenage Male: Technical and Psychological Considerations

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Note: Postings to *Androlog* have been lightly edited before publication.

Advances in assisted reproductive technologies now make it possible for couples to achieve pregnancy when very limited quantities of motile sperm are available. One area that has been positively affected by such progress is sperm cryopreservation prior to initiation of chemotherapy or radiation therapy. A discussion pertaining to sperm cryopreservation should be an integral part of the management of oncologic disease in male patients of reproductive age. The topic of discussion in this edition of *Androlog* Summary revolves around the process of collecting sperm from adolescent boys who, due to psychological stress or unfamiliarity or inexperience with masturbation, are not able to produce a semen specimen for sperm cryopreservation.

The discussion was initiated by a clinical scenario related by Drs Schrepferman and Belker:

As a result of our having made the local oncologic community aware of the possibility of cryopreserving sperm from men about to undergo chemotherapy that is expected to result in the development of azoospermia, we have had several last-minute requests to obtain sperm before chemotherapy is initiated. Because of the nature of these situations, such requests are invariably made with only a few days (at the most) of advance notification. Because of the overwhelming concern for the patient's prognosis for survival of the malignancy and the various last-minute oncologic considerations, there is little or no time for adequate counseling of the patients or their families about the various sperm retrieval techniques, including the merits of each method for obtaining the best sperm that may survive cryopreservation.

Our recent encounter with an adolescent boy scheduled for anesthesia to allow port placement for planned chemotherapy came on the morning of the planned procedure that was scheduled for early afternoon of the same day. Obviously, obtaining a masturbated semen specimen would be the easiest method to obtain sperm for cryopreservation, but considerable psychological stress is induced (probably for the physician as well as for the patient and family) when considering this option for a very young teenager. As

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we discussed the options, we realized that the simplest way to obtain sperm would be vibratory penile stimulation. We had 2 concerns about this. The first concern was whether penile vibratory stimulation would be successful when performed under anesthesia. If anyone has information about this, a response would be appreciated. The other concern obviously was subjecting a teenager to such a procedure and the psychologic stress that this procedure might create for him.

Obvious alternatives also were considered. Electroejaculation under anesthesia is the obvious alternative choice. The duration of 1–1½ hours to obtain sperm using microsurgical epididymal sperm aspiration seems to make this a poor choice in this setting. Percutaneous epididymal sperm aspiration could be useful. The possibilities of testicular sperm extraction or testicular sperm aspiration also exist, although many in vitro fertilization laboratories, including the ones with which we are associated, are not enthusiastic about their success rates with the use of thawed testicular sperm.

Having considered the options mentioned, we would like to know the thoughts and experience of the *Androlog* community about this issue. All responses will be appreciated.

Dr Aaron Spitz replied, suggesting that electroejaculation would potentially minimize the likelihood of epididymal obstruction or testicular injury when compared to surgical sperm harvesting.

Regarding urgent sperm retrieval in a teenager prior to chemotherapy: I would recommend masturbation as a first-line remedy. I don't believe vibratory stimulation will work on an anesthetized, spinally intact individual, and in the conscious state, it may actually be painfully intense. The port placement surgery could conceivably be delayed a day or two to allow the teenager to masturbate. If the circumstances conspire to require sperm retrieval, electroejaculation will give the patient the option of artificial insemination, although the yield will be poor, and the specimen should be partitioned for several cycles of in vitro fertilization as well. Another advantage of electroejaculation is the preservation of the excurrent ducts, should the patient maintain his spermatogenesis postchemotherapy. And it bypasses any risk to the testicle, however slight, that might be incurred from testicular sperm extraction. If electroejaculation is not feasible, testicular sperm extraction will preserve the excurrent ducts from scarring, should the patient's sperm production be preserved postchemotherapy, although carefully performed microsurgical epididymal sperm aspiration high in the epididymis may not actually cause definitive obstruction of that entire ipsilateral system.

Dr Stanton Honig also advocated the use of electro-

ejaculation if the patient could not obtain a specimen via masturbation.

I don't think vibratory stimulation would work, whether the patient is awake or under anesthesia. Masturbation with production of a sample would be the best option. If this were not an option, based on the physical and emotional maturity of the patient, I would proceed with electroejaculation, since this will give you the best-quality specimen for assisted reproductive technologies (possibly intrauterine insemination or likely in vitro fertilization). I would prefer this to a testicular sperm aspiration. I recently had a similar case in which the patient was physically mature, had a history of nocturnal emissions, but never masturbated. I performed an electroejaculation with good results and cryopreservation prior to initiation of chemotherapy.

In the final response in this discussion, Dr Robert Oats joined the other respondents in encouraging sperm acquisition via masturbation, if at all possible, and opined that penile vibratory stimulation would be unlikely to succeed in this setting. He suggested that testicular sperm extraction offered a relatively simple alternative to electroejaculation.

Regarding the question about sperm cryopreservation in a teenager: we all agree that if a sample can be obtained by masturbation, that will be best. Penile vibratory stimulation simply provides a powerful sensory input to the ejaculatory

reflex center, which integrates several afferent pathways (cortical and sensory) and then temporally coordinates 2 efferent pathways (sympathetics to induce emission and bladder neck closure and sacral somatics to stimulate rhythmic contraction of the periurethral musculature—antegrade ejaculation). I would not anticipate penile vibratory stimulation to work under anesthesia. Microsurgical epididymal sperm extraction and percutaneous sperm aspiration would be appropriate in the obstructed system (ie, congenital bilateral absence of the vas deferens), but the epididymis, not being a storage organ proper, will probably be completely nondilated and flat, and I would not anticipate that either will work in this circumstance. Electroejaculation will allow recovery of some seminal fluid, but anesthesia is required and may put the very ill at risk. In addition, I would not perform electroejaculation at the same time as portacath placement (or any other sterile line), as it is necessarily a very unsterile procedure and may induce a transient bacteremia (from the rectal probe or the urethral catheterization). I think the easiest approach is testicular sperm extraction with cryopreservation. If the patient does not recover spermatogenesis in the future, the tissue can be used at that time. Since this will be in the future, it is irrelevant how the in vitro fertilization group feels about the use of frozen testis tissue at this moment—it will be in the future, and their success may have certainly changed and improved and, if not, another in vitro fertilization program can always be selected. Their job, at this moment, is to do the best they can to cryopreserve a specimen you provide to them. Good luck with this young boy.