LETTER TO THE EDITOR

Vasal vessels preserving microsurgical vasoepididymostomy in cases of previous varicocelectomy: a case report and literature review

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Dear Editor,

Vasoepididymostomy plays an important role in treating epididymal obstructive azoospermia and this procedure is becoming more popular in the developing countries. However, we believe its effectiveness and safety should also be considered. Varicocelectomy is very common in treating male infertility due to palpable varicocele and decreased semen quality, as well as reducing testicular pain. Therefore the question remains is whether simultaneous/asynchronous microsurgery of vasoepididymostomy and varicocele ligation safe? During vasoepididymostomy, the vasal vessels are routinely ligated to facilitate anastomosis, and surgical varicocele repair will change the blood supply and the venous return of testis. Because the integrity of vasal vasculature plays a vital role in postvaricocelectomy blood supply and the venous return of testis, how to resolve this predicament is therefore crucial in restoring the normal function and homeostasis of testis. We report here one case of vasal vessels preserving microsurgical two-suture intussusception vasoepididymostomy, in a patient who had varicocelectomy previously.

In May 2014, a 25-year-old Chinese male was admitted into our hospital for azoospermia. He came to our hospital in May, 2012 for infertility after 1-year marriage, the history of seminal tract infection 5 years ago was reported. His wife had no infertility factors. The semen analysis indicated that no sperm was detected, although the volume was at 2.5 ml, and scrotal ultrasound evaluation demonstrated bilateral varicoceles and epididymal tubular ectasia, while the testis were normal. Transrectal ultrasound (TRUS) evaluation found normal terminal vas deferens, seminal vesicles, ejaculatory ducts and prostate. The patient refused the recommendation of vasoepididymostomy. In July 2013 he received bilateral traditional inguinal varicocelectomy in his local hospital because of scrotal pain. In May 2014, he comes back to our hospital for the treatment of azoospermia. Ultrasound evaluation shows the similar results to that 2 years ago except the varicocele was cured, sex hormones are all in the normal range.

We discussed with the patient and his wife regarding the alternative procedure of Intracytoplasmic Sperm Injection (ICSI) that may be of help to treat his infertility, and the need to preserve vasal vessels during vasoepididymostomy; should they elect to receive this procedure. He also required an intraoperative testicular biopsy if it was needed but he refused a biopsy before operation because afraid of the scrotal local anesthesia. The procedure was approved by the Ethics Committee of our hospital, and the informed consent was obtained from the patient.

The procedure was performed under a Zeiss operating microscope (Carl Zeiss, Berlin, German) with 4–21 magnification with modification, and this procedure is becoming more popular in the developing countries.

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In the 3-month follow-up, postoperative ultrasonography evaluation revealed that there was no postoperative hydrocele formation and no testicular atrophy, and the extent of epididymal tubular ectasia was decreased. The semen analysis showed that semen density was 1.0 million ml$^{-1}$ (semen volume 2.6 ml) without forward motile sperm. In 9 months, sperm count increased to 15.7 million ml$^{-1}$ (semen volume 2.0 ml).

Even with the help of microscope, the incidence of accidental testicular artery ligation in microsurgical varicocelectomy was approximately 1%. Nonmicrosurgical varicocelectomy often ligated more spermatic artery or arteries than microsurgical approach, at this situation, just like this patient, the most important artery supply of testis maybe the deferential artery. In the case of that internal spermatic artery has been inadvertently ligated in varicocelectomy, the intraoperative ligating of the deferential artery may cause testicular atrophy, as recently reported by Goldstein and colleagues that in 19 patients who underwent simultaneous vasovasostomy and varicocelectomy, a significantly higher rate of varicocele recurrence and testicular atrophy.

When ligating the internal spermatic and cremasteric veins, venous return after varicocelectomy is affected by deferential and scrotal veins, or, when gubernacular veins are ligated, by deferential veins only. After ligating the internal spermatic vein and cremasteric veins in varicocelectomy procedure, vasal veins ligation in vasoepididymostomy procedure will cause inadequate venous return.

We used the two-suture transverse vasoepididymostomy bilaterally in this patient but not the most popular and most commonly used longitudinal technique by us. This is because that the coincidence that the orientation of selected epididymal tubules were perpendicular to the vas deferens, transverse procedure can make the suture tying under direct vision.

Of course, an intraoperative Doppler can detect if the main branch of testicular artery was injured by previous varicocele ligation, but it is not commonly used in developing countries, and it is difficult to confirm if the venous return was enough in vasoepididymostomy procedure in patients who had previous varicocele repair. The limitation is, if there is embolization, if there is less than total venous ligation such as in nonmicrosurgical varicocelectomy that cremasteric and gubernacular veins maybe intact, performing this procedure routinely in all patients appears not justified. However, as far as we know, during microsurgical varicocelectomy, some surgeons will also ligate the gubernacular veins, demonstrating that the vas vein can afford the testis vein return independently postoperation, but no paper has ever demonstrated that the cremasteric veins combined with the gubernacular veins can afford the testis veins drainage, furthermore, gubernacular veins are only found in 71%–79% of varicocele patients. Our results revealed that the vasal vessels preserving vasoepididymostomy was safe and effective in protecting the testicular artery supply and venous return, especially when the site of anastomosis was corpus or cauda and the tension-free anastomosis is feasible.

**AUTHOR CONTRIBUTIONS**
YZ were responsible for the concept and framework of the paper. XW, XJY and HZ participated in collecting the clinical data. YZ, XW and XJY were responsible for the artwork. YZ wrote the paper and were responsible for the final editing. BZ supervised the study. All the authors read and approved the final manuscript.
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COMPETING INTERESTS
The authors declare no competing interests.

REFERENCES
1 Jungwirth A, Giwercman A, Tournaye H, Diemer T, Kopa Z, et al. European association of urology guidelines on male infertility: the 2012 update. Eur Urol 2012; 62: 324–32.
2 Kumar R, Mukherjee S, Gupta NP. Intussusception vasoepididymostomy with longitudinal suture placement for idiopathic obstructive azoospermia. J Urol 2010; 183: 1489–92.
3 Mehta A, Goldstein M. Microsurgical varicocelectomy: a review. Asian J Androl 2013; 15: 56–60.
4 Chan PT. The evolution and refinement of vasoepididymostomy techniques. Asian J Androl 2013; 15: 49–55.
5 Mirilas P, Mentessidou A. Microsurgical subinguinal varicocelectomy in children, adolescents, and adults: surgical anatomy and anatomically justified technique. J Androl 2012; 33: 338–49.
6 Zhang H, Huang WT, Ruan XX, Li LY, Di JM, et al. Microsurgical transverse 2-suture intussusception vasoepididymostomy: effectiveness and rationality. Chin Med J (Engl) 2013; 126: 4670–3.
7 Marmar JL. Modified vasoepididymostomy with simultaneous double needle placement, tubulotomy and tubular invagination. J Urol 2000; 163: 483–6.
8 Chan PT, Wright EJ, Goldstein M. Incidence and postoperative outcomes of accidental ligation of the testicular artery during microsurgical varicocelectomy. J Urol 2005; 173: 482–4.
9 Liu X, Zhang H, Ruan X, Xiao H, Huang W, et al. Macroscopic and microsurgical varicocelectomy: what’s the intraoperative difference? World J Urol 2013; 31: 603–8.
10 Goldstein M. Surgical management of male infertility. In: Wein A, Kavoussi LR, Novick AC, Partin AW, Peters CA, editors. Campbell-Walsh Urology. Philadelphia, PA: Elsevier Saunders; 2012. p. 648–87.
11 Cocuzza M, Pagani R, Coelho R, Srouqi M, Hallak J. The systematic use of intraoperative vascular Doppler ultrasound during microsurgical subinguinal varicocelectomy improves precise identification and preservation of testicular blood supply. Fertil Steril 2010, 93: 2396–9.