SHORT COMMUNICATION

BANGKOK, THAILAND

Epididymal Distension as a Predictor of the Success of PESA Procedures

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Purpose: To evaluate the value of epididymal distension in predicting the success of percutaneous epididymal sperm aspiration (PESA) procedure.

Methods: Physical examination of epididymis to detect epididymal distension and PESA were performed in 49 obstructive azoospermic patients divided into two groups according to its causes (Group I: previous vasectomy, $n = 27$ and Group II: other causes, $n = 22$).

Results: Epididymal distension was found in 42 cases (85.7%). PESA was successful in 42 out of the 49 patients, giving a sperm retrieval rate of 85.7%. The success rate of PESA in Groups I and II is 92.6 and 77.3%, respectively. The accuracy, sensitivity, specificity, and positive and negative predictive value of epididymal distension for the overall patients were 86.7, 90.5, 64.2, 93.8, and 52.9%, respectively. The success rate of PESA procedure in patients with epididymal distension was significantly higher than in patients without epididymal distension ($p < 0.05$).

Conclusions: The presence of epididymal distension in obstructive azoospermic men was predictive of PESA success.

KEY WORDS: Epididymal distension; percutaneous epididymal sperm aspiration (PESA); obstructive azoospermia.

INTRODUCTION

The combination of sperm retrieval and intracytoplasmic sperm injection (ICSI) have been shown to be a highly efficient treatment method for azoospermia. Percutaneous epididymal sperm aspiration (PESA) is a safe and effective sperm retrieval procedure for obstructive azoospermia for ICSI procedures (1). PESA success rate range from 61 to 95% (1–5).

External genital examination is an important part of patient evaluation because some findings especially testicular size and epididymal distension can confirm

the diagnosis of obstructive azoospermia (6). Epididymal sperm retrieval was shown to be associated with clinically distended epididymis in the vasectomized men (2). However, the relation of epididymal distension with the success of PESA procedure in obstructive azoospermic patients and its predictive value have not been evaluated. It would be useful to be able to predict the success of PESA by a simple physical examination.

MATERIALS AND METHODS

The population comprised 49 consecutive patients with obstructive azoospermia who underwent sperm retrieval during 1998–2000. All obstructive azoospermic men had normal testicular volume and normal serum FSH concentration. The diagnosis of azoospermia was made from at least two semen analyses when no spermatozoa were found in the pellet obtained following semen centrifugation at 1500g for 10 min.

Prior to sperm retrieval, all men underwent a complete history and physical examination to identify the causes of azoospermia, including an assessment of testicular size and epididymal distension. Each epididymis was classified as either distended or normal. Epididymal distension was defined as an enlargement and tenseness of any portion of the epididymis on palpation.

A comprehensive description of these procedures can be found in the previous report (7). Briefly, PESA took place in the operating room, using intravenous sedation anesthesia with propofol and local anesthesia with Bupivacaine injected in the skin and underneath the epididymal caput. The epididymal caput was identified and held firmly between thumb and index finger. A small needle (26 gauge) was connected to a 1 mL disposable syringe. The proximal part of the epididymal caput and distension sites were punctured. Suction was applied to the syringe and the needle was withdrawn gradually to the point where segments of fluid from the epididymis were seen entering the syringe. The aspirate was then flushed out of the needle and syringe into a petri dish using HEPES-buffer. This procedure can be performed as many times as necessary until sufficient sperm are recovered from both sides. The end point of this study was the results of PESA classified as either success or failure. Each side of epididymis was assessed separately. Successful PESA was defined when the amount of motile epididymal sperms retrieved by PESA were adequate for ICSI procedures. Testicular sperm retrieval was

prepared as a backup procedure in case PESA failed. Ethical approval was obtained from the local ethical committee.

All statistical analyses were performed with the SPSS for Windows v. 10.05 (SPSS Inc., Chicago, IL). For continuous variables with normal distribution, results were presented as mean and standard deviation. The sensitivity, specificity, and positive and negative predictive values were calculated. The Fisher's exact test was used for analysis of 2×2 tables. The results were considered statistically significant when the p value was <0.05 .

RESULTS

A total of 49 obstructive azoospermic patients underwent surgical sperm retrieval. The patients' age, combined testicular volume, and serum FSH concentration of the study population were 44.2 ± 8.8 years, 34.5 ± 8.1 mL, and 3.0 ± 0.8 IU/L, respectively. Twenty-seven patients (Group I) had history of previous vasectomy, including failed vasectomy reversal in 15 cases. Twenty-two patients (Group II) had obstructive azoospermia from other causes, such as congenital bilateral agenesis of vas deferens (CBAVD), history of epididymitis, and unknown causes.

Epididymal distension was found in 42 cases (85.7%) (unilateral epididymal distension 3 cases and bilateral epididymal distension 39 cases). Bilateral epididymal distension was found in all Group I patients. Epididymal distension was found in 15 out of 22 cases (68.2%) in Group II patients (unilateral epididymal distension 3 cases and bilateral epididymal distension 12 cases).

PESA was successful in 42 out of the 49 patients, giving an overall sperm retrieval rate of 85.7%. The success rate of PESA in Groups I and II is 92.6 and 77.3%, respectively. Testicular sperm aspiration (TESA) and testicular sperm extraction (TESE) were done for 1 patient and 6 patients, respectively, when PESA failed. Finally, viable spermatozoa were obtained for ICSI from all cases.

The outcome of PESA in relation to the presence of epididymal distention is shown in Table I. Epididymal distension was found to have an accuracy of 86.7%, sensitivity of 90.5%, specificity of 64.2%, positive predictive value of 93.8%, and negative predictive value of 52.9%. The success rate of PESA procedure in epididymis with distension (93.8%) was significantly higher than in epididymis without distension (47.1%) ($p < 0.05$).

Table I. The Results of PESA in Relation to the Presence of Distended Epididymis^a

Epididymal distension	PESA	
	Success (n = 84)	Failure (n = 14)
All obstructive azoospermic cases		
Presence (n = 81)	76	5
Absence (n = 17)	8	9
Group I (Obstructive azoospermia with previous vasectomy)	Success (n = 50)	Failure (n = 4)
Presence (n = 54)	50	4
Absence (n = 0)	—	—
Group II (Obstructive azoospermia from other causes)	Success (n = 34)	Failure (n = 10)
Presence (n = 27)	26	1
Absence (n = 17)	8	9

^a Each side of epididymis was assessed separately.

In Group I, epididymal distension was found to have an accuracy of 92.6%, sensitivity of 100%, and positive predictive value of 92.6%. In Group II, epididymal distension was found to have an accuracy of 79.5%, sensitivity of 76.5%, specificity of 90.0%, positive predictive value of 96.3%, and negative predictive value of 52.9%.

DISCUSSION

PESA procedure is an effective sperm retrieval procedure for obstructive azoospermic men. The advantages of PESA are minimal discomfort for the patient, low complication rate compared to open surgery, repeatability, and the production of clear aspirated fluid with minimal blood contamination and less debris. PESA does not require microsurgical skills, is easy to learn, and can be performed as an outpatient clinic procedure (3). However, PESA success rate ranged from 61 to 95% (1–5).

Several factors have been shown to be associated with the success of PESA procedures, including the etiology of obstructive azoospermia (4) and the operator's experience (1). As the PESA procedure is a blind surgical retrieval technique, the success of this procedure depends on several experiences, including the palpation of the epididymis and correct positioning of the needle so that it enters the substance of the epididymis.

Epididymal distension is a subjective physical finding that can be a clinical clue to suggest epididymal

obstruction (6). In this study, epididymal distension was found in 85.7% of the obstructive azoospermic men. Therefore, it can be used to confirm the diagnosis of obstructive azoospermia, although a normal epididymal examination cannot rule out obstruction.

In this study, overall epididymal distension gave a correct prediction of 86.7%. Epididymal distension had a high positive predictive value but a low negative predictive value. Recently, PESA success rate in vasectomized men was shown to be associated with clinically distended epididymis. PESA was successful in 84% of distended or grossly distended epididymis compared with only 14.3% of nondistended epididymis (2). In this study, bilateral epididymal distension in Group I was found in all cases and there was an extremely high success rate of PESA techniques in this group of patients. Therefore, epididymal distension was not helpful than a clinical history of previous vasectomy. Following vasectomy, spermatogenesis continues, the human epididymis and ductus deferens may distend and leak, and the extravasated spermatozoa stimulate formation of a sperm granuloma. Therefore, epididymal distension is generally found after vasectomy and may lead to granuloma formation there (8). False positive in this group may be caused by multiple sites of epididymal obstruction after vasectomy. In Group II, epididymal distension also gave a high positive predictive value (96.3%). However, the presence of epididymal distension still had false positive and false negative prediction. In the false positive cases of both groups, moderate amount of serous fluid with static sperm or without sperm can be obtained from the distended epididymis. The multiple obstruction sites in the epididymis may cause the loculation of fluid in the epididymal tubule with no connection to the testis. False negative cases may be caused by many factors, such as operator's experience and sites of obstruction. Additional epididymal sonography may be helpful for confirmation of the physical examination and investigation of the nature of the abnormalities.

In conclusion, the presence of epididymal distension in obstructive azoospermic men was predictive (a high positive predictive value) of PESA success. The absence of epididymal distension in these men, however, cannot rule out obstruction. Taken as a part of the entire clinical picture, epididymal examination can provide useful information to physicians including confirmation of the diagnosis of obstructive

azoospermia. The success rate of PESA procedure in epididymis with distension was significantly higher than in epididymis without distension. This information would be useful in planning the procedures and counseling patients about their treatment options. Finally, the probability of successful PESA in patients with obstructive azoospermia could be objectively predicted on the basis of external genital examination represented by the distended epididymis and normal testicular size.

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Nares Sukcharoen^{1,3}
Tippawan Sithipravej²
Sakchai Promviengchai²

¹ Department of Obstetrics and Gynaecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

² Nawabutra Center for Assisted Reproduction and Embryology, Bangkok 10330, Thailand.

³ To whom correspondence should be addressed at Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand; e-mail: sukcharoen@yahoo.com.