Azoospermia due to Obstruction of Ejaculatory Duct and its Endoscopic Treatment

Azospermii'ye Bağlı Ejakulatuar Kanalin Obstrüksiyonu ve Endoskopik Tedavisi

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SUMMARY

The clinical condition due to obstruction of the ejaculatory ducts is described. This condition should be suspected in the following symptoms: Azoospermia, low semen volume, absence of fructose in semen. The diagnosis subsequently can be confirmed by digital rectal examination, urethrocystoscopy and transrectal ultrasonography. The method of treatment by transurethral resection (unroofing) of the ejaculatory duct is described; the results are encouraging and we suggest that this neglected clinical problem should receive more attention by the uro-andrologists.

Key Words: Obstructive infertility, Azoospermia, Ejaculatory duct

ÖZET

Ejakulatuar kanalin obstrüksiyonunu araştırdık. Bu durum klinik bolgulardan (azonpermii, düşük semen volümü, ejakulatta fruktoz eksikliği), şüphelenilmesi üzerine; rektal tuşe, üretrösistoskopi ve transrektal ultrasonografi ile tanısı konulabilir.

Transuretral rezeksiyon ile tedaviye anlatıldı ve sonuçları tartıştıldı. Sonuçlar umit vericiidir. Bu göz ardi edilebilir sorunun uro-androloglar tarafından daha dikkatli araştırılması faydalıdır.

Anahtar Kelimeler: Obstrüktif infertility, Azoospermia, Ejakulatuar kanal

Infertility caused by ejaculatory duct obstruction is rare. Obstruction due to the cysts are reported increasingly in the recent years. The incidence of ejaculatory duct obstruction among infertile men has been reported to be 3 to 7.4% (1). The importance of diagnosing this entity is its potential reversibility. Obstructions in the ejaculatory duct probably result from any congenital development abnormality. They can be Wolffian duct remnants, Müllerian duct remnants, prostatic cysts, seminal vesicle cysts and diverticula of the ejaculatory duct (2). Azoospermia, low semen volume, absence of fructose and poor semen coagulation are the characteristics of this type of obstruction and these are also indications for these patients to be investigated. Investigations for differential diagnosis consist of digital rectal examination (DRE), urethrocystoscopy, transrectal ultrasonography (TRUS). We report herein our experience in five patients with ejaculatory duct obstruction in our institution.

PATIENTS AND METHODS

Between 1992-1995 we have five patients...
and treated by transurethral unroofing procedure. They were all admitted for infertility investigation. Duration of their marriage was 3-9 years (mean 4.6 years) and their ages were 26-33 (mean 27.1). Symptoms and signs of these patients revealed that there were no other complaints. On physical examination the volumes of the tests were normal, and vas deferenses were palpable bilaterally in all patients. The digital rectal examination (DRE) disclosed cystic structures in two patients just above the base of the prostate. Semen analysis revealed no spermatozoa in the semen, low volume (<1ml) and negative fructose on repeated at least two analysis in 5 patients. Serum gonadotropine, free testosterone and prolactine levels were normal in all patients. In our algorithm the next step for investigation was TRUS. In all patients obstruction of ejaculatory duct due to a cyst was confirmed by TRUS (Fig 1A and B). In the patients with abnormal DRE the urethrocystoscopy showed elevations in the prostatic urethra just posterior to the verumontanum. In one of the patients there was an elevated hemitrigone, and in another one there was endurated and edematous verumontanum. After the diagnoses of obstruction of ejaculatory duct due to a cyst, we offered transurethral resection of the floor of the prostate in a small area just proximal to the external sphincter and distal to the bladder neck (unroofing). Four patients accepted the treatment, and underwent the unroofing procedure. Three of the patients were followed-up for more than 1 year while the fourth one was lost to follow-up.

RESULTS

All these five patients had a history of infertility and on examination they had low semen volume, and all had azoospermia (Table 1). Four of these patients underwent transurethral resection of the floor of the prostatic urethra (unroofing). We were able to follow-up 3 patients for one year post-operatively. These patients had spermatozoa in the postoperative ejaculates with the return of normal semen volume (>2ml) and fructose. However only 2 of these 3 patients had sperm counts at fertile levels. These 2 patients fathered children in 1 year time after the operation.
**TABLE 1: The summary of the results of the patients**

<table>
<thead>
<tr>
<th>Spermogram/Volume</th>
<th>DRE</th>
<th>Cystoscopy</th>
<th>TRUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1 Azoospermia/ &lt;1ml</td>
<td>normal</td>
<td>normal</td>
<td>Cystic dilation in the prostate</td>
</tr>
<tr>
<td>Patient 2 Azoospermia/ &lt;1ml</td>
<td>normal</td>
<td>elevated hemitrigone</td>
<td>Cystic dilation in the prostate</td>
</tr>
<tr>
<td>Patient 3 Azoospermia/ palpable cystic elevation in &lt;1ml structure</td>
<td>edematous</td>
<td>Cystic dilation in the prostate</td>
<td></td>
</tr>
<tr>
<td>Patient 4 Azoospermia/ &lt;1ml</td>
<td>normal</td>
<td>verumontanum</td>
<td>Cystic dilation in the prostate</td>
</tr>
<tr>
<td>Patient 5 Azoospermia/ palpable cystic elevation in &lt;1ml structure</td>
<td>edematous</td>
<td>prostatic urethra</td>
<td>Cystic dilation in the prostate</td>
</tr>
</tbody>
</table>

DRE = digital rectal examination, TRUS = transrectal ultrasonography

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**DISCUSSION**

Obstruction of the ejaculatory duct can occur due to cysts of one of the following: Ejaculatory duct, Müllerian duct, Wolffian duct, prostate and seminal vesicles. It is difficult to differentiate these cysts from each other clinically. Review of the literature demonstrates that some misdiagnosis exists. In 1954 a case was presented as an ectopic ureter, but today it is suggested that it was probably an urogenital sinus cyst(3). Therefore it was proposed to use the term "urogenital sinus cyst" for all of these midline retroprostatic/retrovesical cysts that communicate with the vasa and seminal vesicles(4,5,6). We had also used the term "urogenital sinus cysts" for our patients.

Cysts of the urogenital sinus are usually located in the midline. A review of the embryology clarifies their differences. The Müllerian ducts fuse in the male embryo and end blindly at verumontanum (Müller's tubercle), and only vestigial structures remain. If its caudal portion persists, it is named as prostatic utricle (or Müllerian duct cyst), and its cranial portion makes appendix testis. The Wolffian duct makes the epididymis, vas, seminal vesicles, ejaculatory ducts, and prostate in the male embryo. Any developmental defect can cause a Wolffian cyst. Normally, there is no communication between the two systems. A true Müllerian duct cyst, would not contain any sperm, but a Wolffian duct cyst would. Both cysts can cause obstruction in the ejaculatory duct due to their masses.

Usually patients with urogenital sinus cysts admit with infertility complaints. The symptoms and signs that cause suspicion for urogenital sinus cysts are azoospermia with normal gonadotropin serum levels, low semen volume and absence of fructose in semen. These symptoms are the most common ones in patients with urogenital sinus cysts. In the literature there are also other symptoms like intermittent gross hematuria, perineal discomfort, urinary retention, continuous pain in the testicle(4,7,8). Therefore uro-andrologists should give attention to all of these symptoms and signs for differential diagnosis.

Azoospermia is reported to be due to complete obstruction of both ejaculatory ducts. There are some conditions of partial or incomplete obstruction and these conditions may present with oligozoospermia(9,10). The mass of the cyst was found to be compressing the ejaculatory duct and the contents of the seminal vesicle could be partially emptied. In partial obstruction the motility of the spermatozoa is also consistently impaired.

TRUS has been very useful in delineating these cysts. When there is a suspicion of an obstruction especially in infertile male, TRUS should be used in the differential diagnosis, especially in patients with low semen volume. It is non-invasive,
office-based, inexpensive, and readily available. This non-invasive method is superior to the invasive, radiographic vasogram, and therefore the use of vasogram has decreased significantly(11). Computerized tomography and MR imaging has also been used for investigating vasal abnormalities, but the best resolution can be achieved by TRUS.

The management of the urogenital sinus cyst was previously with open surgery(12,13). But in 1973 Farley and Barnes and later Porch introduced transurethral resection for these cysts(14,15). Nowadays the most accepted treatment is transurethral resection. The resection of the floor of the prostate was performed just proximal to the external sphincter (verumontanum) across the ejaculatory ducts. If possible, an effort was done to form a channel from ejaculatory duct into the prostatic urethra. In the literature there was a case treated successfully by ultrasonically guided fine needle aspiration, but the follow-up was only for 9 months(7).

We have 5 patients with urogenital sinus cyst in 2 years time. They were all married for a median 4.6 of years. One of them did not accept transurethral resection because of the possibility of a second operation. Other four patients underwent transurethral unroofing procedure. We have cut 3-4 chips just next to the verumontanum, in two patients a large cyst-like opening was revealed on the prostate floor after the resection. After cautering all bleeding we left an indwelling catheter for 2-3 days. Although all 4 had spermatozoa in the semen post-operatively, only 2 patients could achieve children after the procedure. In one patient, who is being followed-up for 1 year, the semen parameters are still under fertility level. In 1985 Goldwasser reviewed 19 patients with urogenital sinus cyst, treated by transurethral resection (unroofing) and showed that 8 of them fathered children (42% pregnancy)(5). Recently ICSI (Intra Cytoplasmic Sperm Injection) is popularized also in our country. Using this technique pregnancy rate can be increased in patients whose spermiogram are still under fertility level.

In conclusion we can say that urogenital sinus cyst should be remembered in the differential diagnosis of patients complaining infertility. For diagnosis TRUS is the most accurate tool, and management by transurethral resection (unroofing) is encouraging.

REFERENCES

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