The role of benign prostatic hyperplasia treatments in ejaculatory dysfunction

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Ejaculatory dysfunction is not only psychologically distressing but can become a significant obstacle for men who wish to conceive. Dysfunction comes in the form of anejaculation, reduced ejaculation, retrograde ejaculation, painful ejaculation, or premature ejaculation. Most treatments for lower urinary tract symptoms related to benign prostatic hyperplasia, which commonly occurs in aging men, carry significant risks of absent, reduced, or retrograde ejaculation. This review focuses on such risks that accompany both the medical and surgical management of lower urinary tract symptoms/benign prostatic hyperplasia and how these risks impact male fertility. (Fertil Steril® 2021;116:611–7. ©2021 by American Society for Reproductive Medicine.)

Key Words: Benign prostatic hyperplasia, ejaculation, ejaculatory dysfunction, alpha-blocker, finasteride, transurethral resection of prostate, TURP, HoLEP, prostatic urethral lift, water vapor therapy, aquablation

Lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH) are a constellation of urinary symptoms that can be exceedingly bothersome. While presentation is more common in middle-aged and elderly men, BPH can develop in men who are in as early as the fourth decade of life (1). Several treatment options for LUTS, both pharmacologic and surgical, can have significant sexual side effects, particularly ejaculatory dysfunction. For men who are interested in conceiving, this poses an issue. Some of these treatments are even offered to younger men who are experiencing urinary symptoms due to causes other than BPH, such as pelvic floor dysfunction. Therefore, it is important for all prescribing practitioners to understand the side effects and fertility implications of such interventions.

Ejaculation is an autonomic process that consists of two primary phases, emission and expulsion. During emission, secretions from the seminal vesicles, vasal ampulla, and prostate are emptied into the prostatic urethra. After this, expulsion occurs via contraction of the bulbospongiosus muscle as well as the urethral smooth muscle to propel the fluid out through the meatus. Before both emission and expulsion, the bladder neck closes so that the fluid does not inadvertently enter the urinary bladder. When this does occur, this is considered retrograde ejaculation. In other cases, treatments may result in reduced or no production of the seminal fluid, leading to anejaculation.

When ejaculatory dysfunction results from pharmacologic treatments for BPH, it is typically reversible with cessation of the medication. However, when it is secondary to surgical treatments, it is often permanent. Ejaculatory dysfunction can not only lead to psychological stress, but it can also lead to male infertility as the sperm is no longer able to travel out of the urethra. For those who wish to conceive, this becomes a very challenging situation.

MATERIALS AND METHODS

A literature search was performed using the PubMed and Embase databases. Specifically for a review of the role of alpha-blockers, the terms "BPH," "benign prostatic hyperplasia," "ejaculation," "anejaculation," "retrograde ejaculation," and "ejaculatory dysfunction" were used in conjunction with "tamsulosin," "terazosin," "doxazosin," "alfuzosin," and "silodosin." Randomized clinical trials (RCTs) were prioritized in this review. Crossover and open-label studies were excluded. Meta-analyses that included placebo-controlled trials were targeted for the review of 5-alpha reductase inhibitors as well as surgical treatments.

ALPHA-BLOCKERS

The use of alpha-blockers for the treatment of bothersome LUTS was first studied in 1975 (2). The rationale behind its efficacy is that the relaxation of the prostatic smooth muscle would

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allow for improved urinary flow. These early studies first explored the use of phenoxybenzamine, which improved LUTS but also carried a significant side effect profile likely due to concurrent alpha-1 and alpha-2 blockades. Further investigation later revealed that the prostatic smooth muscle contained receptors predominantly of the alpha-1 subtype and that medication should be targeted to this. Prazosin was one such medication that proved to be efficacious; however, its short-acting mechanism prevented widespread use. Over the subsequent decade, multiple long-acting selective alpha-1 blockers were studied and became Food and Drug Administration approved for the use of BPH treatment. Terazosin was the first of these, followed by doxazosin (3). Tamsulosin, a selective alpha-1a blocker, was then approved in the late 1990s. By avoiding blockade of alpha-1b receptors, which are commonly found in the vasculature, the side effect profile was even more favorable with lower rates of hypotension. Finally, in the early 2000s, the more recent alpha-blockers, alfuzosin and silodosin, were approved. Although alfuzosin does not have alpha-1a selectivity, it is still considered to be a uroselective agent as prostatic penetration is said to be higher (3). Silodosin is a similar agent to tamsulosin but designed to have even higher alpha-1a selectivity.

Ejaculatory dysfunction has been noted to be a side effect of all alpha-blockers across numerous studies, despite hopes that superselectivity would minimize this (Table 1). Alpha-1a receptors are located in the prostate, bladder neck, seminal vesicles, and vas deferens. Contraction of the smooth muscle in these locations leads to production and transport of seminal fluid. Conversely, alpha-1a blockade causes relaxation of the smooth muscle, ultimately leading to decreased emission of fluid and possibly an incompletely closed bladder neck (4). The end result may be retrograde ejaculation or anejaculation. It is unclear whether one of the two mechanisms is more prominent, particularly because the alpha-blockers with subtype selectivity have higher rates of ejaculatory dysfunction. Moreover, the studies report a range of dysfunction, from retrograde ejaculation to decreased or absent ejaculation, suggesting a combination of the two mechanisms.

Terazosin and Doxazosin

Roehrborn et al. (5) described a randomized, placebo-controlled, double-blind study comparing men who received a placebo with those who received terazosin. Analysis revealed that urinary symptoms and quality of life significantly improved in the intervention group. Among the secondary outcomes, ejaculatory dysfunction was identified in 0.2% (n = 2) of the placebo group and 1.4% (n = 15) of the intervention group. This difference was statistically significant; however, ejaculatory dysfunction was not specifically defined.

Compared with terazosin, doxazosin is thought to be similar in composition and efficacy. Fwu et al. (6) examined the effects of placebo, doxazosin only, finasteride only, and combination treatment on sexual function. Doxazosin treatment alone did not lead to a significant increase in the incidence of ejaculatory dysfunction. At 1-year follow-up, the incidence of ejaculatory dysfunction for the placebo arm was 6% compared with 8% in the doxazosin arm. At 4 years, the numbers increased to 12% in the placebo group and 12% in the doxazosin group. Although there was a trend toward increased ejaculatory dysfunction over time, there was no statistically significant difference between placebo and treatment with doxazosin. In an earlier study, Fawzy et al. (7) compared placebo (n = 50) to doxazosin 2–8 mg (n = 50). Unfortunately, ejaculatory dysfunction was not specifically examined as part of adverse events. The investigators mentioned that there were no reports of sexual dysfunction; however, it is unclear whether the subjects were specifically asked about this. Nonetheless, studies suggest that there is a slightly increased rate of ejaculatory dysfunction, although unclear whether statistically significant.

Tamsulosin

In 1998, a randomized placebo-controlled trial by Lepor (8) demonstrated that those treated with daily tamsulosin had a significantly increased rate of abnormal ejaculation and that this effect was dose-dependent. The three comparison groups included placebo, 0.4-mg tamsulosin, and 0.8-mg tamsulosin. The placebo group reported no ejaculatory dysfunction, compared with 6% and 18% of the 0.4-mg and 0.8-mg tamsulosin groups, respectively. The differences in the three groups were noted to be statistically significant. The results of a parallel phase III double-blind randomized trial comparing placebo with 0.4-mg and 0.8-mg tamsulosin reported similar results and suggested a dose-dependent relationship (9). The placebo group had a 0.5% incidence of abnormal ejaculation, whereas the 0.4-mg and 0.8-mg tamsulosin groups had an incidence of 11% and 18%, respectively. These differences in the two tamsulosin groups were statistically significant compared with each other as well as with the placebo group.

The trials indeed support the conclusion that abnormal ejaculation is a true side effect of tamsulosin. A study by Goktas et al. (10) is noteworthy as it examined whether modifying the frequency of tamsulosin administration to every other day as opposed to daily would minimize the ejaculatory side effects. In this prospective cohort, the incidence of ejaculatory dysfunction was 7.4% after daily 0.4-mg tamsulosin. After altering the regimen, 63.3% saw resolution of their ejaculatory symptoms after 6 weeks, primarily among those who had reported retrograde ejaculation. Urinary symptoms remained stable. Although cessation of tamsulosin will resolve ejaculatory symptoms, altering the frequency may be an option as well.

Alfuzosin

Manohar et al. (11) reported results on a randomized trial comparing 0.4-mg tamsulosin with 10-mg alfuzosin with 8-mg silodosin. No control group was used. Follow-up was conducted at 1, 4, and 12 weeks. Ultimately, at 12 weeks, the incidence of ejaculatory dysfunction was 0% in the alfuzosin group, 3.4% in the tamsulosin group, and 9.7% in the silodosin group. No baseline assessment of ejaculatory function was made, so it is unclear whether the results at 1-week follow-up are similar to baseline function or true changes

TABLE 1

Incidence of ejaculatory dysfunction with alpha-blocker use.

First author	Year	n (treatment)	Alpha-blocker/dosage	Mean/median follow-up	% EjD in placebo vs. intervention	Statistical significance
Fawzy et al. (7)	1995	50 (placebo) 50 (doxazosin)	Doxazosin 2–8 mg QD		NA	NA
Roehrborn et al. (5)	1996	560 (placebo) 657 (terazosin)	Terazosin 2–10 mg QD	12 mo	0.2 (placebo) 1.4 (terazosin)	SS
Fwu et al. (6)	2014	672 (placebo) 696 (doxazosin)	Doxazosin 4–8 mg QD	12 mo 48 mo	At 12 mo 6 (placebo) 8 (doxazosin) At 48 mo 12 (placebo) 12 (doxazosin)	NS
Manohar et al. (11)	2017	103 (tamsulosin) 103 (alfuzosin) 103 (silodosin)	Tamsulosin 0.4 mg QD Alfuzosin 10 mg QD Silodosin 8 mg QD	1 wk 4 wk 12 wk	At 1 wk 3.4 (tamsulosin) 3.5 (alfuzosin) 11.8 (silodosin) At 4 wk 0 (tamsulosin) 0 (alfuzosin) 6.5 (silodosin) At 12 wk 3.4 (tamsulosin) 0 (alfuzosin) 9.7 (silodosin)	NS
Lepor (8)	1998	254 (placebo) 254 (tamsulosin 0.4 mg) 248 (tamsulosin 0.8 mg)	Tamsulosin 0.4 mg QD Tamsulosin 0.8 mg QD	13 wk	0 (placebo) 6 (tamsulosin 0.4 mg) 18 (tamsulosin 0.8 mg)	SS
Narayan et al. (9)	1998	239 (placebo) 248 (tamsulosin 0.4 mg) 244 (tamsulosin 0.8 mg)	Tamsulosin 0.4 mg QD Tamsulosin 0.8 mg QD	13 wk	0.5 (placebo) 11 (tamsulosin 0.4 mg) 18 (tamsulosin 0.8 mg)	SS
Kawabe et al. (13)	2006	89 (placebo) 192 (tamsulosin) 176 (silodosin)	Tamsulosin 0.2 mg QD Silodosin 4 mg BID	12 wk	0 (placebo) 11 (tamsulosin) 18 (silodosin)	NA
Rosen et al. (12)	2007	186 (placebo) 186 (alfuzosin)	Alfuzosin 10 mg QD	29 d	1 (placebo) 1 (alfuzosin)	NS
Marks et al. (14)	2009	457 (placebo) 466 (silodosin)	Silodosin 8 mg QD	12 wk	0.9 (placebo) 28.1 (silodosin)	NA

Note: BID = twice daily; EjD = ejaculatory dysfunction; NA = not assessed; NS = no significance; QD = once daily; SS = statistically significant.

Bearelly. BPH treatment and ejaculatory dysfunction. Fertil Steril 2021.

after 1 week of medication use. The trend shows that the alfuzosin group experienced the least amount of ejaculatory dysfunction and the silodosin group experienced the most. Nonetheless, the differences lacked statistical significance. In 2007, Rosen et al. (12) confirmed similar results in a randomized, double-blind, placebo-controlled trial. Among those who were assigned placebo and alfuzosin 10 mg daily, there was no significant difference between the two groups in ejaculatory function compared with baseline. Interestingly, at baseline, 63% of men were already reporting ejaculatory dysfunction associated with their LUTS. Perhaps subtle changes in ejaculatory function may not be ascertained compared with men who have normal baseline ejaculation who then develop new symptoms. Regardless, the studies suggest that alfuzosin 10 mg daily does not significantly impact ejaculation.

Silodosin

Kawabe et al. (13) compared placebo, tamsulosin 0.2 mg daily, and silodosin 4 mg twice daily. Ultimately, the rates of abnormal ejaculation were highest in the silodosin group (22.3%) compared with those in the tamsulosin (1.6%) and placebo (0%) groups. Similarly, Marks et al. (14) reported pooled results of two parallel randomized trials comparing placebo with silodosin 8 mg daily. Abnormal ejaculation was noted in 0.9% of the placebo group and 28.1% of the silodosin group. Statistical significance was not reported in either study; however, the higher rates of ejaculatory dysfunction with silodosin are clinically significant.

Terazosin, doxazosin, and alfuzosin may have lower rates of ejaculatory dysfunction compared with the other alpha-blockers, and this may be attributed to the nonspecific nature of the agents. The more selective and the higher the affinity of the drug to the alpha-1a receptors, the greater the likelihood of ejaculatory dysfunction.

5-ALPHA REDUCTASE INHIBITORS

Finasteride is a type 2 5-alpha reductase inhibitor that is widely used for the treatment of LUTS/BPH. 5-alpha reductase is an enzyme that converts testosterone to dihydrotestosterone, which is responsible for the growth of the prostatic transitional zone. Finasteride inhibits this conversion and is thought to reduce the prostate volume by 20%–30% (15). It is widely used as combination therapy when alpha-blocker monotherapy is ineffective. 5-alpha reductase is located primarily in the prostate and the scalp, so it is also commonly used among men of all ages for hair loss (androgenetic alopecia). Dutasteride is an alternative, which functions by the same mechanism but inhibits both type 1 and 2 5-alpha reductases.

Corona et al. (16) performed a meta-analysis of placebo-controlled RCTs comparing finasteride and dutasteride for the treatment of LUTS/BPH and the effects on erectile dysfunction (ED) and hypoactive sexual desire. Studies investigating finasteride for hair loss treatment were not included. There was found to be an increased risk of hypoactive sexual desire (odds ratio [OR], 1.54 (1.30; 1.81); $P<.0001$) and ED (OR, 1.47 (1.29; 1.68); $P<.0001$) compared with placebo, with no difference in effect between finasteride and dutasteride. The negative effects were inversely related to the trial duration, which has been noted in other studies although underlying reasons are unclear (17–19). Therefore, although some of these effects may resolve within the first year of treatment, it may be permanent for some men and should be discussed with the patient.

An earlier meta-analysis by Gacci et al. (20) found that the risk of ejaculatory dysfunction was significantly higher in both finasteride (OR, 2.70; $P<.0001$) and dutasteride (OR, 2.81; $P<.0001$) compared with placebo. The risk of dysfunction was even higher with the use of combination therapy of alpha-blocker and 5-alpha reductase inhibitor (OR, 3.75; $P<.0001$). Ejaculatory dysfunction included reduced, absent, or painful ejaculation.

Studies investigating the finasteride regimen (1 mg daily) for hair loss are limited. However, one would argue that the younger male population is more likely to use finasteride for the treatment of hair loss than for the treatment of LUTS/BPH. It is also typically this younger age group that is interested in preserving fertility. One clinical trial comparing finasteride 1 mg with placebo showed that within 1 year of starting treatment, the incidence of decreased ejaculate volume was higher in the finasteride group (1% vs. 0.4%) (21). Similarly, the incidence of ED was higher in the treatment group (1.4% vs. 0.9%) as well as that for decreased libido (1.9% vs. 1.3%). Statistical significance of these differences was not noted. The investigators reported that these side effects resolved after discontinuation of therapy; however, there is no information on the average time required for recovery. While the rates of sexual dysfunction, and specifically ejaculatory dysfunction, may be lower for finasteride 1 mg dosing compared with finasteride 5 mg (used for LUTS/BPH), it is significant to review with the patient that any of these sexual side effects can lead to difficulties conceiving and may not be reversible.

CONVENTIONAL SURGICAL TECHNIQUES

Obstructive urinary symptoms secondary to BPH are common among aging men. Even before any treatment consideration, LUTS/BPH itself carries a risk of sexual dysfunction, specifically ED and ejaculatory dysfunction (22). Surgical treatments further increase the incidence of sexual dysfunction. Transurethral resection of the prostate (TURP) has long since been considered the gold standard treatment for BPH with regard to efficacy and safety (23). However, the known risks of this surgical treatment include retrograde ejaculation and anejaculation. Holmium laser enucleation of the prostate (HoLEP) later emerged as an attractive alternative to TURP as it can be used for larger prostate glands and for those at higher risk of bleeding. Holmium laser enucleation of the prostate carries similar risks of ejaculatory dysfunction. The treatment impact on erectile function after both TURP and HoLEP remains controversial.

Transurethral resection of the prostate is an endoscopic electrosurgical treatment where the prostatic adenoma that surrounds the urethra is sequentially resected and removed. The verumontanum is a visible elevation of urothelium within the prostatic urethra that serves as a crucial landmark

indicating the absolute distal extent of resection. This is to preserve urinary continence as the external urinary sphincter lies just distal to this point. The ejaculatory ducts also empty into the prostatic urethra on either side of the verumontanum. Ablation and excessive heat applied to the ejaculatory ducts may lead to anejaculation. More commonly, retrograde ejaculation may occur secondary to overresection of the bladder neck. Typically, the bladder neck should close during ejaculation to encourage antegrade flow of semen. However, during a TURP, resection of the bladder neck is commonly performed to further increase the caliber of the outflow tract, resulting in an incompetent bladder neck and possibly retrograde ejaculation.

Ejaculatory dysfunction has been reported to occur in up to 65% of men after TURP (24). Specifically, retrograde ejaculation can occur in up to 50% of men (25). A systematic review by Verze et al. (26) was conducted to evaluate the rates of erectile and ejaculatory dysfunction after surgical BPH treatments. The results suggest that across all arms who received TURP and HoLEP as treatment, there was a statistically significant decline in ejaculatory function. In contrast, the studies failed to show a significant difference in erectile function among different treatment arms. One study compared baseline sexual function across all subjects before randomization to either TURP or HoLEP for surgical treatment (27). The rates of retrograde ejaculation increased from 16.7% at baseline to 78.3% after TURP. On the other hand, the rates of ED decreased from 51.6% preoperatively to 48.3% after surgery, demonstrating no significant difference. These outcomes were almost identical in the HoLEP treatment arm. A hood sparing technique may be employed for both TURP and HoLEP. Avoiding damage to the paracollicular and supracollicular tissue proximal to the verumontanum, also called the ejaculatory hood, is thought to preserve antegrade ejaculation, although studies have shown mixed results. A recent RCT comparing standard GreenLight photoselective vaporization to that with a hood sparing technique showed that antegrade ejaculation was preserved in 31.6% of those in the standard group compared with 85% in the hood sparing group (28). Another study utilizing the technique during HoLEP did not demonstrate a significant improvement (29).

Alternatively, transurethral incision of the prostate (TUIP) is an option for symptomatic men with smaller prostate glands. During a TUIP, the bladder neck is incised, not resected, down to the level of the verumontanum to release tissue and allow for a wider outlet. In Riehmann et al.'s (30) randomized trial comparing TUIP to TURP, the investigators found that 68% of sexually active patients in the TURP group developed retrograde ejaculation compared with 35% in the TUIP arm. Similar results were found in a later study (31).

It is well known among urologists that TURP, and now HoLEP, carries a significant risk of ejaculatory dysfunction, specifically retrograde ejaculation, and this should be thoroughly discussed with patients as it is irreversible. Erectile function appears to be preserved; however, further studies specifically assessing this as an outcome need to be conducted. Transurethral incision of the prostate has lower rates of dysfunction, but it is not miniscule and can also lead to permanent ejaculatory dysfunction. Although a hood sparing approach with these interventions seems promising, results are mixed and require ongoing investigation.

MINIMALLY INVASIVE TECHNIQUES

Over the past decade, numerous innovative technologies for BPH treatment have been introduced to the field. The goals of these treatments have been to reduce operative time, reduce the risk of bleeding, and reduce the risk of sexual dysfunction. Most treatments are compared against TURP as it remains the standard. Among the minimally invasive methods available to address BPH, prostatic urethral lift (PUL) and water vapor thermal therapy are alleged to offer the highest chance for preserving sexual function.

Prostatic urethral lift, a nonthermal method developed in 2004, cystoscopically implants transprostatic suture to widen the prostatic lumen by compressing the prostatic tissue. Tissue is not removed or ablated. While American Urological Association guidelines support its use for prostates smaller than 80 g and without a median lobe, it has since been Food and Drug Administration approved for prostates up to 100 g and with a median lobe (32). Given its novelty among BPH technologies, few studies have been published on it, especially regarding its long-term durability. Although it statistically significantly improved the International Prostate Symptom Score and Qmax, it had less of an effect on these outcomes compared with TURP in a randomized control trial (33). While this study found that erectile function was preserved in both treatment groups, ejaculatory function was superior in the urethral lift treatment group. Additionally, 100% of patients with urethral lift reported preserved ejaculatory function compared with 34% of patients with TURP reporting anejaculation. Similarly, the LIFT study comparing urethral lift to a sham procedure found no significant differences in sexual function (34). A 3-year follow-up of the study even suggested that there is an improvement in erectile function among men with severe ED treated with urethral lift, supporting the baseline relationship between ED and LUTS/BPH (35). Overall, the evidence supports the conclusion that PUL improves the chances of preserved sexual function compared with other treatment methods.

Another recent technique includes water vapor thermal energy, which is supported by the American Urological Association guidelines for prostates smaller than 80 g. Radiofrequency-generated thermal energy is delivered transurethrally to ablate prostatic tissue. Sexual function is said to be preserved as the thermal effects do not travel beyond the targeted areas. In a randomized trial comparing water vapor therapy to a sham procedure, there were no significant changes in either erectile or ejaculatory function within the first 2 years of treatment. In fact, ejaculatory bother scores appeared improved (36).

Aquablation is yet another recently developed system that employs high-pressure water jet technology that precisely cuts and resects prostatic tissue. Because thermal energy is not used, it is suggested that sexual side effects are minimized. However, it should be kept in mind that with the conclusion of the procedure, urologists may still use electrocautery to achieve hemostasis. Evidence thus far is still

limited, and high-quality placebo-controlled trials have not been conducted. Nonetheless, in comparison to TURP as the standard treatment, Gilling et al. (37) found that 6 months after treatment, anejaculation was less common in the aquablation group than in the TURP group (10% vs. 36%; $P=.0003$) and was even less likely when electrocautery was not used during aquablation (7% vs. 16%; $P=.2616$). Still, the certainty of this evidence is very low (38).

Finally, a simple prostatectomy, open or robotic, can be performed for large prostate glands that are not amenable to endoscopic techniques. Some urologists have employed a urethral-sparing simple prostatectomy via a minimally invasive robotic approach, in which the seminal vesicles, urethra, and ejaculatory ducts are preserved. In Porpiglia et al.'s (39) retrospective analysis, up to 89% of men who reported normal preoperative ejaculation and who underwent a robotic urethral-sparing simple prostatectomy maintained antegrade ejaculation at 12-month follow-up. An earlier study cited similar results with approximately 87% of patients with normal preoperative ejaculation reporting normal function after surgery (40). It should be kept in mind that studies are limited and that ejaculatory outcomes are heavily dependent on surgeon technique and expertise as well as prostatic anatomy.

For these more recent technologies, the limited evidence suggests possible preservation of erectile and ejaculatory function; however, further studies are needed to elucidate the true efficacy and safety.

TREATMENT FOR PERMANENT EJACULATORY DYSFUNCTION

In some cases, retrograde ejaculation may be permanent, requiring alternative methods for sperm retrieval. The least invasive method is the use of sympathomimetic agents, such as pseudoephedrine, to stimulate closure of the bladder neck (41). If unsuccessful, the next option includes urine alkalinization and intrauterine insemination. An acidic environment can harm the sperm so the urine may be alkalinized with an oral sodium bicarbonate solution. The bladder should be emptied before ejaculation, followed by collection of the mixed sperm and urine. This mixture is then inseminated into the partner. Couples have been able to successfully perform this at home (42). Another option is to collect in an office setting where the bladder is catheterized and completely emptied and then instilled with human tubal fluid or a comparable medium (41). The bladder fluid with sperm is then collected after ejaculation, which can then be used for intrauterine insemination or even in vitro fertilization if appropriate.

More invasive forms of sperm retrieval, specifically direct retrieval from the testicles, can be employed if simpler methods are unsuccessful. If there is no concern for sperm production, then an office testicular sperm aspiration or testicular sperm extraction can be done. Sperm aspiration is achieved with the use of a large bore needle and aspiration of one to several tubules. Testicular sperm extraction includes a minor incision in the testicle and excision of a small amount of tubules. Sperm directly from these testicular tubules are usually immotile and can then be used for intracytoplasmic sperm injection.

In conclusion, intact sexual function, particularly ejaculation, is crucial in the realm of male fertility. Anything that impedes the outflow of semen, whether it is ejaculatory dysfunction or ED, will cause significant challenges for men attempting to conceive. There are certainly organic sources of such dysfunction, but it is significant to acknowledge the iatrogenic causes as well, such as LUTS/BPH treatments. Pharmacologic therapies carry a significant risk of ejaculatory dysfunction; however, the more nonselective agents appear to have less of an effect. With regard to surgical treatments, there is strong evidence demonstrating that TURPs and HoLEPs can lead to ejaculatory dysfunction. Alternative treatments such as PUL, water vapor therapy, and aquablation may provide LUTS/BPH treatment while preserving ejaculatory function. The evidence is strongest for PUL followed by water vapor treatment, while aquablation remains to be studied further.

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