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Functional State and Quality of Life in Patients with Benign Prostatic Hyperplasia after Prostatic Artery Embolization

Sobirova Dildora Ravshanovna[1], Azimov Sardor Ilxomovich[2]

[1]Department of Histology and Medical Biology, Tashkent Medical Academy

[2]Department of Urology, Bukhara State Medical Institute

Abstract: Benign prostatic hyperplasia (BPH) is a polyetiological disease of men, mainly of elderly and senile age, which is caused by the growth of adenomatous tissue in the transient zone of the prostate gland. The consequence of this pathological growth is the occurrence of obstruction of the lower urinary tract. In the stage of decompensation, the disease leads to a number of serious complications, including the inability to urinate independently, which requires the installation of a urinary drainage system for constant urine drainage.

Keywords: Minimally invasive, X-ray endovasular, adenomectomy, embolization.

In recent years, there has been a search for alternative methods of surgical interventions to overcome the existing problems [1,3]. At the same time, none of the methods is universal; they often require high-tech equipment, are invasive and require anesthetic aid.

One of the most minimally invasive and sparing methods of treating BPH, which is fundamentally different in its approach to solving the problem, is the method of embolization of the arteries of the prostate (EAP). This technique is aimed at blocking the arterial supply of the hyperplasia node and, as a consequence, its further reduction. EAP allows for interventions without the use of anesthetic methods, which makes it possible to use it in a wider group of patients. The active development of the technique has been taking place for the last 10-15 years, and every year there are more and more publications on its effectiveness [4,5,6,8,9].

The purpose of this report was to assess the functional state of the lower urinary tract and the quality of life of patients in the immediate period after PAE in the treatment of BPH.

Material and methods The work is based on the analysis of examination data and treatment of 6 patients with BPH. At the time of the study, all patients underwent conservative therapy that did not stop the progression of BPH and / or level the symptoms of the lower urinary tract (LUTS). The study period was from September 2018 to April 2019. The treatment with the EAP method was carried out on the basis of the X-ray endovascular department of the BOMMC.

All patients had concomitant pathology, in which the risk of performing an open adenomectomy increased manifold. The degree of anesthetic risk according to ASA - III, IV. The patients' age ranged from 60 to 69 years. All patients underwent a standard urological examination before EAP and after 3 months, including the IPSS and QoL questionnaire, transrectal sonography, residual urine volume, urine flow rate, and PSA level.

Endovascular intervention was performed using the ALLURA CENTRON angiographic complex (Philips, Holland). The complex is characterized by high image quality and a special dose reduction system, ease of patient positioning. Digital subtraction angiography was performed with a frame rate of 0.5–7.5 to 30 frames / s. A trazograph was used as an X-ray contrast agent. One injection consumed from 3–15 ml (with superselective injection) to 50 ml (aortography) of contrast medium. The contrast was introduced manually.

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For therapeutic purposes, Merit Vedical microspheres (USA), 300–500 μm in size, were used as embolization material. Embolization was performed until the stop contrast effect was achieved in the proximal parts of the prostatic artery, there was no contrasting of the distal segments of the artery, and the presence of reflux in the parietal branches during control contrasting of the prostatic arteries.

Exclusion criteria for patients scheduled for EPA:

- Signs of azotemia (increased levels of urea and creatinine in the blood);
- Pronounced average share;
- Sclerosis of the prostate as an outcome of chronic calculous prostatitis.

Research results

In the postoperative period, all patients took tamsulosin 4 mg, 1 capsule once a day for 1 month.

In the early postoperative period, the most characteristic adverse event was postembolization syndrome, manifested by pain in the perineum, anus, lower abdomen, frequent urge to urinate, and cuts along the urethra. To prevent and alleviate its degree in the postoperative period, suppositories with diclofenac sodium at a dose of 75 mg per rectum were prescribed once a day before going to bed for 5 days. Pain sensations were assessed on a 10-point scale. Pain syndrome was mild and averaged up to 3 points.

There were no significant complications in the late postoperative period (from the sixth day after the operation). The cases of ischemia of the rectal mucosa, ischemia of the mucous membrane of the bladder wall, ischemia of the mucous membrane of the glans penis, deterioration of erectile function, described by foreign researchers, were not recorded in our observations [7]. Only in one observation after 1 month, according to the control TRUS of the prostate and urinary bladder, “plus tissue” was revealed in the lumen of the urinary bladder, located parietally in the region of the organ fundus. This complication was assessed as ischemia of the bladder mucosa. The specified formation was exfoliated with manipulation forceps in order to prevent stone formation. After cystoscopy, the patient noted his discharge during urination.

The dynamics of urination indicators, the size of the prostate gland and other indicators after PAE is presented in Table 1.

Table 1: Results of treatment of patients with BPH by the PAE method (M ± m)

Estimated indicator	Before EAP, n=6	1st month after, n=6	3rd month after, n=6
RV volume (cm 3)	53,6±8,3	33,4±6,8 P<0,05	28,6±6,4 P<0,06
Residual urine volume (ml)	55,9±5,3	22,0±1,8 **P<0,001**	20,4±1,7 P=0,658
Urine flow rate (ml / s)	9,2±0,3	11,7±0,2 **P<0,001**	14,9±0,4 **P<0,001**
IPSS (points)	28,2±0,7	18,4±0,7 **P<0,001**	13,7±0,8 **P<0,001**
QoL (points)	4,8±0,2	3,1±0,2 **P<0,001**	2,6±0,1 **P=0,006**
PSA total (ng / ml)	5,9±1,1	3,5±0,8 **P<0,001**	2,1±0,3 **P=0,029**

Note: *P is the statistical significance of the difference from the values of the previous observation period.*

In the examined patients, the volume of the prostate gland decreased by 53.3% from the initial level during 3 months of observation, the volume of residual urine decreased by 36.5% from the initial level. There was also a positive dynamics of urine flow rate within 3 months and the associated IPSS and QoL values decreased accordingly in a similar way.

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Conclusion *The EAP method is relatively new. Its use has become possible thanks to the development of endovascular surgery. There is no experience of long-term follow-up of patients treated with EAP. At the same time, today EAP is one of the few methods that can be used in patients with severe concomitant diseases. As our first experience with the use of EAP in patients with BPH has shown, this method of treatment is low-traumatic and effective in eliminating bladder outlet obstruction. This technique is an alternative to open adenomectomy, which is especially important for debilitated patients with a high risk of anesthesia.*

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