

# Giant prostatic enlargement: A presentation of a rare asymptomatic case

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## Abstract

Benign prostatic hyperplasia is a histological diagnosis and the most frequent benign tumor in older men, and its incidence strongly correlates with advanced age. Giant prostate enlargement (GPE), also known as giant prostatic hyperplasia, is a term given for severely enlarged prostates that weigh more than 500g. GPE cases reported in literature is less than 30. We describe our experience of removing previously asymptomatic 528g prostate by open transvesical prostatectomy. According to transrectal ultrasound (TRUS) the prostate size is 482 ml and prostate-specific antigen level of 5.1 ng/ml. Histological examination showed nodular prostatic hyperplasia, an adenomatous variant with foci of cystic atrophy, chronic prostatitis. The patient's post-operative recovery went without any relapses and complications.

**Key words:** benign prostatic hyperplasia, lower urinary tract symptoms, giant prostatic enlargement

## Introduction

Benign prostatic hyperplasia (BPH) is a histological diagnosis that refers to the proliferation of smooth muscle and epithelial cells in the transitional zone of the prostate gland [1,2]. The most frequent benign tumor in older men is BPH, and aging is a major predictor of incidence [3,4]. Patients with BPH will suffer from lower urinary tract symptoms (LUTS). Still, a significant percentage will also present with other BPH-related complications and seeking urological care [3-6]. LUTS can be divided into storage, micturition, and post-micturition symptoms [7]. Giant prostate enlargement (GPE), also known as giant prostatic hyperplasia, is a term given for severely enlarged prostates that weigh more than 500g [8]. The size of the prostate and symptoms' presence and severity are not positively correlated. A large prostate may not cause symptoms, but a small prostate may [9]. We describe our experience of removing previously asymptomatic 528g prostate by open transvesical prostatectomy.

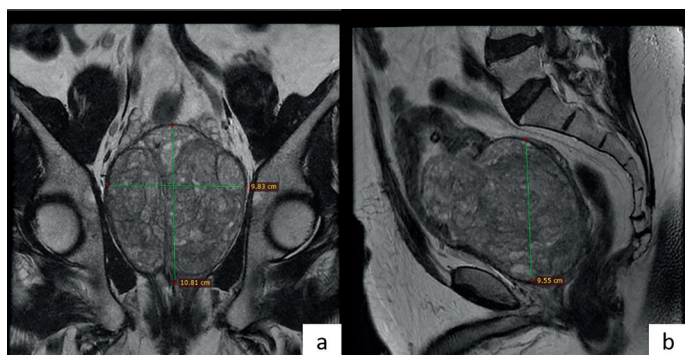
## Case presentation

Patient A., 72 years old, was admitted to the multidisciplinary city hospital №1 in Astana with complaints of nocturia and pain. According to the patient,

these complaints bothered him for last one year. Based on the results of an outpatient examination (TRUS: prostate volume 482 cm<sup>3</sup>; PSA 5.1 ng/ml; uroflowmetry: obstructive type of urination), LUTS was diagnosed, and surgical treatment was recommended.

Urological profile: per rectum - the prostate gland is enlarged, spherical in shape, painful on palpation, densely elastic consistency, the interlobar sulcus is smoothed, the rectal mucosa over the gland is mobile; uroflowmetry revealed the signs of infravesical obstruction with a maximum urine flow rate (Q<sub>max</sub>) of 9.1 ml/s; IPSS 15 points, QoL - 4 points; according to transrectal US (TRUS) the size of the gland is 482 cm<sup>3</sup>, the capsule is not thickened; residual urine volume is 200 ml when filled with 380 ml.

**MRI results:** On MRI T2 mode in axial (a) and coronal (b) projections, the prostate gland is significantly enlarged in size up to 100.4x93.5x108.1 mm, with clear uneven contours, heterogeneous structure due to the presence of multiple nodular formations, various shapes, up to 32.8x21.2 mm in size, without clear zonal differentiation, with signs of prolapse into the bladder (Figure 1).



**Figure 1** - MRI of the patient

**Surgery:** Under spinal anesthesia, a transverse incision was made, and access was made to the anterior bladder wall. A urethral catheter 22 French was inserted, and the bladder was filled. The bladder was taken on holders, between which it was opened. A finger was inserted rectally, a surgical capsule was opened, and the adenomatous tissue of the prostate gland was enucleated bluntly. A gland of dense consistency was 15-16 cm in diameter. Two hemostatic sutures were placed on the surgical capsule. The Foley catheter balloon is inflated, and the balloon is stretched. During revision of the bladder, blood clots were removed and epicystostomy was placed. The integrity of the anterior wall of the bladder was restored with a two-row suture and checked for tightness. A rubber is installed in the Reitz space. The wound is sutured in layers and aseptic bandage was placed (Figure 2).



**Figure 2** - The prostate after surgery

**Histological conclusion:** In the studied preparations were fragments of prostate tissue. The glands are located unevenly, close to each other, and separated by fibrous tissue. Some acini are lined with a single-layer prismatic epithelium of different heights; in some acini are a proliferation of the epithelium with the formation of multilayer multi-row, papillary structures. In single glands, foci of epithelial proliferation with a violation of the row. Some of the glands are cystically dilated and contain a dense protein secret. There are foci of acinar structures of various sizes, unevenly located and lined with a flattened epithelium. There is pronounced fibrosis in

the stroma, and focal lymphoplasmacytic infiltration, mainly around the glands. Circulatory disorders - stasis, plethora and hemorrhages. Fragments of the prostatic part of the urethra with hemorrhages and subepithelial lymphoplasmacytic infiltration. *Histopathological conclusion:* nodular prostatic hyperplasia, an adenomatous variant with foci of cystic atrophy. Chronic prostatitis.

The postoperative period was without complications. Antibacterial, anti-inflammatory, hemostatic, infusion, and anticoagulant therapy was carried out. The urethral catheter was removed on the seventh day. Spontaneous urination was restored. The patient was holding urine, periodically noticing a slight instillation of urine (using two pads). He was discharged from the clinic for outpatient follow-up after ten days.

## Discussion

LUTS is a common complaint in adult men. Understanding the lower urinary tract as a single functional compartment and the multifactorial etiology of associated symptoms implies that the current focus is on LUTS rather than benign prostatic hyperplasia (BPH). BPH is inappropriate because treatment is indicated if the clinically LUTS is a benign prostatic obstruction (BPO) [10]. BPH is almost ubiquitous in aging men, with autopsy evidence of histological prevalence worldwide, increasing from age 40–45, reaching 60% at age 60 and 80% at age 80 [4].

Inflammation is also thought to play a role in the pathogenesis and progression of BPH [10,11]. Although there are several hypotheses, BPH is likely the result of a multifactorial process, the exact etiology of which is unknown. However, the presence of functioning testicles is necessary for developing BPH. According to hypotheses, giant prostate enlargement is caused by a combination of normal stromal-epithelial paracrine communication disturbance, an imbalance between androgen, cytokine, and peptide growth signals, reduced apoptosis, and stromal and epithelial cell proliferation [12]. Particularly, inhibition of the p53 suppressor gene and mutations in proto-oncogenes such as Ras and c-erbB2 can result in aberrant and continuous cell proliferation [12].

When Fishman and Merrill reported on the successful surgical excision of a prostate weighing 526g in 1993, they introduced the term "Giant Prostate Enlargement" (GPE) to describe a prostate weighing more than 500g [8].

MRI, computed tomography (CT), and transrectal US (TRUS) can all be used to measure prostate volume. Our patient had TRUS volume of 482 cm<sup>3</sup> and an MRI volume of 528 cm<sup>3</sup>. And he did not complain any symptoms before a year of surgery. When a patient experiences severe LUTS that is unresponsive to medical therapy, acute or chronic urinary retention, resistant gross hematuria, urinary tract infections, obstructive nephropathy, bladder stones, or urinary tract infections surgery is indicated [13]. For patients with a prostate volume between 30 and 80 ml, the European Association of Urology currently recommends transurethral resection of the prostate, and for prostate volumes greater than 80 ml, open surgery or transurethral enucleation using a holmium laser [10]. The recommended surgical method for GPE is open surgical enucleation either the suprapubic (transvesical) or retropubic approach. There haven't been any reports of GPH being successfully managed with holmium laser enucleation yet, in spite of the procedure showing satisfactory outcomes with large-sized prostates. In addition, a number of studies have shown that these minimally invasive methods are effective for treating significantly enlarged prostates. Less postoperative catheter time, a shorter hospital stay, less complications,

and comparable results to open prostatectomy are all associated with these procedures [14-16]. Even though severely enlarged prostates may be treated using minimally invasive methods, just one study showed that GPH greater than 500 g could be successfully treated [14]. A case of GPH was successfully treated using the prostate arterial embolization [17]. Bhatia et al, reported that 6 weeks after starting this treatment, the patient's bothersome LUTS had improved and prostate volume had decreased from 571 to 270 ml. They believed that this method would be appealing for men with significantly enlarged prostates

who also have co-morbid conditions because it is minimally invasive and has low morbidity. It should be noted, however, that open procedure is still frequently utilized for moderately to severely enlarged prostates because laparoscopic and robotic surgeries are not easily accessible in a developing nation.

In the literature review [18], only 32 prostates met the GPE criteria, including three patients diagnosed by imaging but not offered surgical treatment. This makes the current case the 33rd reported case of a giant prostate in medical history (Table 1).

**Table 1** All GPE cases reported in the literature.

	Weight (g)/ Volume (cc)	Year	Treatment	Outcome
Thomson-Walker [19]	680	1920	Open surgical resection	Survived
Middleton [20]	557	1937	Open surgical resection	Survived
Wadstein [21]	705	1938	Open surgical resection	Survived
Gilbert [22]	713	1939	Open surgical resection	Died
Nelson [23]	720	1940	Open surgical resection	Deid
Ockerblad [24]	820	1946	Open surgical resection	Died
Bacon [25]	602	1949	Open surgical resection	Survived
Lantzius-Beninga [26]	705	1966	Open surgical resection	Survived
Ashamalla and Ahmed [27]	695	1972	Open simple transvesical prostatectomy	Survived
Kitagawa and Kano [28]	535	1980	Open surgical resection	Survived
Tolley et al. [29]	1058	1987	Open surgical resection	Survived
Fishman and Merrill [8]	526	1993	Open simple retropubic prostatectomy	Survived
Medina Pérez et al. [30]	2410	1997	Open surgical resection	Not mentioned
Hosseini and Safarinejad [31]	508	2004	Open simple transvesical prostatectomy	Survived
Yilmaz et al.[32]	610	2006	Open simple transvesical prostatectomy	Survived
Sood et al. [33]	522	2006	Open simple transvesical prostatectomy	Survived
Akpo and Akpo [34]	510	2010	Open simple transvesical prostatectomy	Survived
Üçer et al. [35]	734	2011	Open surgical resection	Survived
Appiah et al. [36]	800	2014	Open Simple Transvesical Prostatectomy	Survived
Maliakal et al. [12]	740	2014	Open simple transvesical prostatectomy	Survived
Khan et al. [37]	700	2014	Open simple retropubic prostatectomy	Survived
Wroclawski [38]	720	2015	Open simple transvesical prostatectomy	Survived
Lacy et al. [39]	708	2015	Open radical retropubic prostatectomy	Survived
Bhatia et al. [17]	571	2015	Prostate artery embolisation	Survived
Domínguez et al. [40]	3987	2016	No treatment required	n/a
Wang et al. [41]	800	2016	Long-term indwelling catheter	Survived
Zeng et al. [14]	524	2017	Laparoscopic simple prostatectomy	Survived
Egote et al. [42]	700	2018	Open simple transvesical prostatectomy	Survived
Anglickis M et al. [43]	800	2019	Open simple transvesical prostatectomy	Survived
Aghamir et al. [44]	1070	2020	Open simple retropubic prostatectomy	Survived
Ojewola et al. [18]	512.5	2020	Open simple retropubic prostatectomy	Survived
Cui et al. [45]	522	2022	Bipolar transurethral resection of the prostate	Survived
Our case	528	2022	Open simple transvesical prostatectomy	Survived

After the operation, we examined our patient four weeks later. He had satisfactory urination and urinary retention. Histopathology of the surgical material showed characteristic signs of BPH.

## Conclusion

GPE is a rare type of enormous prostatic enlargement that only occasionally appears in case reports. In most cases, GPE associated with recurrent bleeding and LUTS. Despite the enormous size of the prostate gland, surgery should only be performed when necessary and the patient is a good candidate. The most popular type of surgical treatment continues to be open surgery. Prostatic artery embolization, laparoscopic and robotic simple prostatectomy are alternatives to open surgery when they

are available. Before enucleation, careful hemostasis can help to limit intraoperative blood loss.

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