SURGICAL SUCCESS: A CASE STUDY OF GIANT BENIGN PROSTATIC HYPERPLASIA TREATED WITH MILLIN PROSTATECTOMY

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ABSTRACT

Introduction: Giant prostatic hyperplasia (GPH) is an exceedingly rare form of benign prostatic enlargement, often presenting as a retrovesical pelvic mass that mimics malignancy. Management is further complicated by severe cardiopulmonary comorbidities that preclude minimally invasive surgery.

Case Report: A 72-year-old male with congestive heart failure (low ejection fraction) and a prior TURP presented with painless macrohematuria, progressive LUTS, and weight loss. Imaging revealed a massive 14×12×10 cm hypodense retrovesical mass displacing the bladder and causing left hydronephrosis. Cystoscopy identified a concurrent bulbar-membranous urethral stricture. Under optimized general anesthesia, a single-stage multimodal procedure was performed: Sachse cold-knife internal urethrotomy, bilateral retrograde ureteral stenting, Millin's retropubic simple prostatectomy with complete enucleation of a 500-gram adenoma, left ureteroneocystostomy, and preperitoneal hernioplasty. Postoperative recovery was uneventful, with resolution of hematuria, normalization of renal function, and discharge on day six.

Discussion: Millin's retropubic approach provides superior apical visualization and hemostatic control while avoiding the adverse hemodynamic effects of pneumoperitoneum and Trendelenburg positioning. Integrating Sachse urethrotomy and ureteroneocystostomy addresses concurrent urethral and ureteral pathologies in a single anesthetic event.

Conclusion: A single-stage surgical paradigm combining Sachse urethrotomy, Millin's retropubic prostatectomy, and ureteroneocystostomy is safe, feasible, and effective for GPH with complex pelvic distortion in high-risk cardiopulmonary patients.

Keywords: *Giant prostatic hyperplasia, Millin prostatectomy, ureteroneocystostomy, Sachse urethrotomy, retrovesical mass.*

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INTRODUCTION

Background and Pathophysiological Context

Benign prostatic hyperplasia (BPH) is an almost universal, age-related histopathological condition in aging men, affecting approximately 50% of individuals in their sixth decade of life and rising linearly to over 80% in those over 80 years of age. The hyperplastic process predominantly involves the proliferation of both stromal and epithelial cells within the periurethral and transitional zones of the prostate gland, leading to the mechanical compression of the prostatic urethra and subsequent bladder outlet obstruction (BOO).

While most cases of BPH present with moderate-to-severe lower urinary tract symptoms (LUTS) responsive to pharmacotherapy or standard transurethral resection of the prostate (TURP), extreme cases can result in massive adenomatous expansion. Glands that exceed a resected weight or volume of 500 g or 500 ml are classified as giant prostatic hyperplasia (GPH). GPH is an exceptionally rare pathological entity, with fewer than 30 cases documented in global medical literature.

The underlying cellular and molecular mechanisms that trigger such extreme, tumor-like growth of benign prostatic tissue remain poorly understood.[5] Current literature suggests that GPH may arise from a profound imbalance in the prostatic microenvironment, characterized by an exaggerated overexpression of local growth-promoting factors—such as vascular endothelial growth factor (VEGF) and basic fibroblast growth factor (bFGF)—concomitant with a significant downregulation or complete absence of local inhibitory growth factors.

This uncontrolled, continuous nodular hyperplasia eventually escapes the anatomical limits of the true pelvic cavity, projecting superiorly and posteriorly to present as a massive intra-abdominal or retrovesical pelvic mass.[3]

Research Objectives

The primary objective of this clinical case report is to present the diagnostic complexity, detailed

surgical execution, and therapeutic outcomes of a highly complex, single-stage reconstructive surgical intervention for a patient presenting with GPH mimicking a suspected bladder or pelvic tumor.

This study aims to outline a comprehensive clinical protocol for managing multiple coexisting urological pathologies—specifically GPH, an iatrogenic bulbar-membranous urethral stricture, a reducible medial inguinal hernia, and mechanical distal ureteral obstruction—in a single operative setting under optimized general anesthesia.

Clinical and Academic Benefits

From an academic perspective, this report provides a clinical blueprint for urological specialists managing severe pelvic anatomical distortions caused by massive benign prostatic enlargement. Because global urological guidelines (such as those of the European Association of Urology [EAU] and the American Urological Association [AUA]) primarily focus on managing standard prostate volumes (≤ 80 ml), there is a significant lack of clinical pathways for GPH.[6]

This study details the surgical safety, anatomical considerations, and postoperative management of GPH. It also provides crucial guidance on managing high-risk cardiopulmonary patients who are unsuitable for minimally invasive laparoscopy or robotic surgery.[6]

Research Hypothesis

It is hypothesized that a single-stage, open extraperitoneal Millin's retropubic simple prostatectomy, preceded by a Sachse cold-knife urethrotomy and accompanied by a distal ureteroneocystostomy, provides superior direct visualization of the prostatic apex, optimal hemostatic control, and complete anatomical resolution of concurrent upper and lower urinary tract obstructions compared to transvesical or minimally invasive approaches in patients with GPH and severe cardiac limitations.

Identified Research Gap

A prominent gap in current urological literature is the lack of standardized surgical strategies that integrate upper urinary tract reconstruction (such as ureteroneocystostomy) and urethral stricture resolution during the enucleation of GPH.

Most published GPH case reports describe straightforward open suprapubic (transvesical) enucleations without addressing concurrent urethral or distal ureteral reconstruction, nor do they detail the anesthetic and hemodynamic challenges encountered in geriatric patients with severe cardiac dysfunction.[2]

Scientific Novelty

The scientific novelty of this report lies in its detailed presentation of GPH presenting as a retrovesical tumor with a concurrent left medial inguinal hernia, an iatrogenic bulbar-membranous urethral stricture, and unilateral distal ureteral obstruction.

This is the first documented case successfully managed through a highly coordinated, single-stage surgical sequence (Sachse optical urethrotomy → bilateral retrograde ureteral stenting → Millin's retropubic simple prostatectomy → left ureteroneocystostomy → preperitoneal hernioplasty) in a geriatric patient with congestive heart failure and a severely reduced ejection fraction.

CASE ILLUSTRATION

Anamnesis and Clinical Presentation

A 78 years old male was referred to the urologic surgery department of RSUP Dr. Sardjito Yogyakarta from Dr. Soedirman General Hospital with a suspected bladder tumor and a retrovesical pelvic mass. The patient's chief complaint was painless, macroscopic hematuria (red-colored urine) persisting for approximately one month.

He also reported a six-month history of progressive LUTS, primarily characterized by bothersome urinary frequency and nocturia. The patient denied experiencing dysuria, flank pain, back pain, fever, nausea, vomiting, acute urinary retention, or a history of passing urinary stones. However, he reported an associated weight loss of 11 kg over the preceding eight months.

The patient had a significant social history of smoking for over 50 years. His surgical history was notable for a prior TURP procedure performed for benign prostatic enlargement.

Additionally, he had a medical history of a reducible (reponible) left medial inguinal hernia and congestive heart failure (CHF) due to left ventricular dilatation, resulting in a severely reduced cardiac ejection fraction (EF ≤ 35%). Because of these severe comorbidities, the patient was undergoing active joint care with the departments of digestive surgery and cardiology.

Physical and Diagnostic Examinations

On physical examination, the patient was hemodynamically stable but demonstrated a visible mass in the left medial inguinal annulus medialis during the Valsalva maneuver. This mass could be easily reduced manually back into the abdominal cavity.

Figure 1. A mass is visible pushing the bladder anteriorly.

Digital rectal examination (DRE) was highly limited; a massive, firm pelvic mass was palpated projecting against the anterior wall of the rectum, preventing the examiner's finger from reaching the upper border of the prostate. Preoperative diagnostic investigations revealed the following:

- **Laboratory Evaluation:** Serum biochemistry showed mild postrenal impairment, with an elevated Blood Urea Nitrogen (BUN) of 38 mg/dl and an elevated serum creatinine of 1.42 mg/dl. Urinalysis and other routine hematological profiles were within normal physiological limits.
- **Abdominal and Pelvic Ultrasound:** Visualized a large pelvic mass on the posterior wall of the bladder displacing the bladder anteriorly; the prostate gland itself was highly distorted and difficult to assess adequately.
- **Contrast-Enhanced Computed Tomography (CT) of the Abdomen and Pelvis:** Identified a massive, well-circumscribed, hypodense retrovesical lesion measuring 12.7 x 9.8 cm. This mass infiltrated the prostate gland and exerted severe mechanical compression on the bladder (pushing it anteriorly) and the rectum (compressing it posteriorly), alongside mild left-sided hydronephrosis.
- **Preoperative Cystoscopy:** Revealed a significant urethral stricture in the bulbar-membranous region, likely iatrogenic from the previous TURP, which completely obstructed the passage of a standard cystoscope.

Parameter	Value	Clinical Reference / Significance
BUN	**38 mg/dl**	Elevated; indicates mild postrenal kidney impairment
Serum Creatinine	**1.42 mg/dl**	Elevated; secondary to distal ureteral mechanical compression
Urinalysis	Normal	No active urinary tract infection or pyuria
CT Scan Mass Size	**12.7 x 9.8 cm**	Massive retrovesical mass displacing bladder and rectum
Cardiac Status	CHF (Low EF)	High risk for fluid overload and Trendelenburg position
Resected Adenoma Volume	**500 cc**	Confirmed diagnosis of Giant Prostatic Hyperplasia
Hospital Stay	**6 days**	Unremarkable postoperative recovery and early discharge

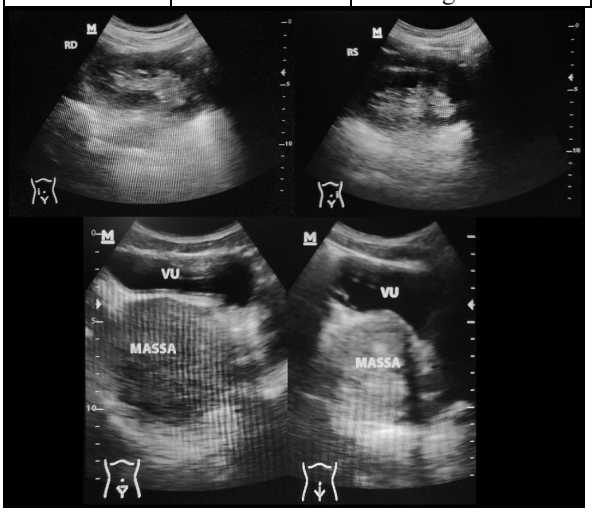

Figure 2. There was a mass on the posterior wall of the bladder pushing the bladder anteriorly.

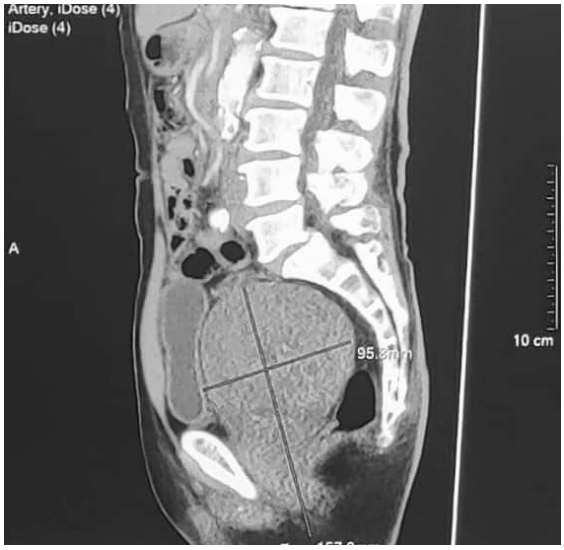

Figure 3. On the CT scan, a mass is visible in the retrovesical area measuring 12.7x9.8 cm, infiltrating the prostate and pressing against the urinary bladder and rectum.

Intraoperative Management and Surgical Execution

The patient was scheduled for a combined, single-stage surgical procedure on April 25, 2024, consisting of a Sachse optical urethrotomy, an open simple prostatectomy via Millin's technique, pelvic tumor excision, and left ureteroneocystostomy.

Under general anesthesia optimized for low-EF cardiac status (maintaining strict fluid balance and avoiding sudden changes in systemic vascular resistance), the patient was placed in a low lithotomy position, prepped, and draped in a sterile fashion.

Endourethral Stage (Sachse Procedure and Ureteral Stenting)

A 21-Fr Sachse internal urethrotome was inserted into the external urethral meatus under direct vision. The bulbar-membranous urethral stricture was identified. A cold-knife incision was performed at the 12 o'clock position to avoid injury to the corpus cavernosum and the urethral sphincter, carrying the cut down to healthy, vascularized subepithelial tissue.

Following the successful restoration of the urethral lumen, a 3-Fr retrograde ureteral catheter was inserted into each ureteral orifice under cystoscopic guidance. These catheters served as vital intraoperative landmarks to protect the ureteral orifices and distal ureters from injury during the subsequent pelvic dissection.

Laparotomy and Millin's Prostatectomy Stage

The patient's position was adjusted to a supine position with slight hyperextension of the lumbar spine. A lower midline abdominal incision was performed to access the retroperitoneal cavity.

Meticulous dissection was carried out to enter the space of Retzius. The massive retrovesical pelvic mass was identified, heavily adhered to the posterior wall of the bladder and the anterior rectum, displacing the bladder anteriorly.

Using blunt and sharp dissection, the tumor tissue was carefully freed from its surrounding adhesions. It was observed that this massive pelvic mass was a direct outgrowth of the prostatic tissue.

The anterior prostatic capsule was cleared of overlying adipose tissue, and the lateral prostatic pedicles were controlled with figure-of-eight sutures. A transverse capsulotomy was performed on the anterior capsule below the bladder neck according to Millin's retropubic technique.

The hyperplastic adenoma was identified and dissected in the subcapsular plane using a combination of sharp and blunt finger enucleation.[8] The massive adenomatous tissue, measuring 500 cc, was completely enucleated and removed in one piece. Hemostasis of the prostatic fossa was secured using figure-of-eight sutures at the 4 and 8 o'clock positions near the bladder neck.

Reconstructive Stage (Left Ureteroneocystostomy and Herniaplasty)

During the dissection and removal of the adherent retrovesical mass, the distal left ureteral segment was found to be severely compressed, fibrotic, and structurally compromised due to chronic pressure from the giant adenoma.

To restore proper urinary drainage and resolve the postrenal impairment, a left ureteroneocystostomy (neoimplantation) was performed. The distal compromised ureter was excised.[2] The healthy proximal end of the left ureter was mobilized, spatulated, and reimplanted into the bladder wall through a newly constructed, non-refluxing submucosal tunnel.

The transverse prostatic capsulotomy was closed in a watertight fashion using a running 2-0 absorbable suture. The simultaneous left medial inguinal hernia was repaired preperitoneally using a suture-based technique through the same lower abdominal incision, avoiding a separate groin incision.

A pelvic drain was placed in the retroperitoneal space, and a 22-Fr three-way irrigation Foley catheter was secured in the bladder and blocked in the prostatic fossa to facilitate continuous postoperative bladder irrigation. The surgical wound was sutured in layers.

Postoperative Course and Follow-up

The patient was transferred to the high-dependency unit for optimized cardiopulmonary monitoring under joint urology and cardiology care.

Continuous bladder irrigation was maintained for the first 24 hours to prevent clot retention in the prostatic fossa, and it was successfully tapered and stopped on the second postoperative day.

The pelvic drain was removed on postoperative day three after the drainage volume decreased to less than 50 ml in 24 hours. The patient did not require any blood transfusions, and his postoperative course was entirely uneventful.

The serum creatinine and BUN levels returned to normal ranges (1.01 mg/dl and 18 mg/dl, respectively) by the fourth postoperative day, confirming the complete resolution of the postrenal obstructive uropathy.

The patient was discharged on the sixth postoperative day with the urethral catheter in place. Seven days after discharge, the catheter was removed during his outpatient follow-up.

The patient reported excellent urinary flow, complete continence, and a total resolution of his preoperative symptoms and hematuria. Histopathological analysis of the 500 cc specimen confirmed benign prostatic stromal and glandular hyperplasia with foci of chronic inflammation, with no evidence of malignancy.

Figure 4. The left image shows the excised prostate, and the right image shows the pelvic tumor previously detected on ultrasound and CT scan.

DISCUSSION

Pathophysiology and Vascular Dynamics of Giant Prostatic Hyperplasia

The term "giant prostatic hyperplasia" (GPH) is reserved for extreme manifestations of BPH where the prostate gland enlarges to a weight or volume exceeding 500 g or 500 ml. While BPH is an exceedingly common pathology in aging men, GPH is an exceptionally rare clinical phenomenon, with only a small number of cases documented globally.

The precise pathophysiological mechanism behind such massive, tumor-like growth remains a subject of ongoing research.[5] It is hypothesized that GPH is driven by an exaggerated local overexpression of growth-promoting factors, such as basic fibroblast growth factor (bFGF) and vascular endothelial growth factor (VEGF), combined with a local down-regulation or absence of inhibitory growth factors within the prostatic stroma.

This molecular imbalance leads to unchecked stromal and epithelial cell proliferation in the transitional zone, causing the gland to expand beyond the limits of the true pelvis.

The pathophysiological basis of painless macrohematuria in this patient is directly linked to the significant increase in prostatic microvessel density and the upregulation of VEGF associated with massive adenomatous growth.[30]

As the GPH mass expands, the newly formed prostatic vessels become highly fragile and prone to spontaneous rupture under the pressure of voiding or pelvic muscle contraction, leading to recurrent macrohematuria.[30]

The patient's profound weight loss of 11 kg over eight months, which raised a strong preoperative suspicion of an advanced malignant pelvic tumor, can be attributed to a combination of chronic inflammation, pelvic discomfort, and systemic stress associated with a massive retrovesical mass.

Diagnostic Mimicry and Radiodiagnostic Pitfalls

When the prostate gland grows to GPH dimensions, it often undergoes atypical intra-abdominal or retrovesical expansion, rather than standard intravesical protrusion.[3] This atypical growth pattern creates a significant diagnostic challenge.[3]

On transabdominal ultrasound and standard pelvic CT scans, a massive 12.7 x 9.8 cm hypodense retrovesical mass can easily be misdiagnosed as a primary bladder tumor, retrovesical sarcoma, seminal vesicle malignancy, or a giant multilocular prostatic cystadenoma.

Because the massive adenoma completely fills the pelvic cavity and pushes the bladder anteriorly, identifying the true organ of origin becomes extremely difficult on standard cross-sectional imaging.

In this case, the CT scan showed a retrovesical lesion infiltrating the prostate and compressing both the bladder and the rectum. This close relationship to surrounding pelvic structures makes radiological differentiation between GPH and aggressive pelvic malignancies almost impossible.[3]

To avoid unnecessary radical exenterative surgery, urologists must integrate multiple diagnostic modalities.[5] Preoperative cystourethroscopy is crucial to evaluate the bladder lumen and rule out primary urothelial carcinoma, while transrectal ultrasound (TRUS)-guided or intraoperative biopsy remains the gold standard to confirm the benign nature of the hyperplastic stromal and glandular tissue before

proceeding with enucleation.[3]

Anatomical and Historical Evolution of Millin's Prostatectomy

Historically, the surgical management of large-volume BPH has undergone a significant evolution.[9] For over a century, open simple prostatectomy remained the gold standard for glands exceeding 80 to 100 g.[6]

Urologists have traditionally chosen between the transvesical (suprapubic) approach popularized by Freyer in 1901 and the retropubic (transcapsular) approach developed by Terrence Millin in 1945 at All Saints Hospital in London.[9]

Millin designed the retropubic approach to address the significant limitations of the transvesical route, which required a large cystotomy and provided poor visualization of the prostatic apex and distal adenoma.[9]

The retropubic Millin prostatectomy was further refined in 1982 by Patrick C. Walsh at Johns Hopkins Medical School, who adjusted the technique to prevent damage to the branches of the pelvic plexus that supply the corpora cavernosa, thereby preserving sexual function and continence.

In cases of GPH, the retropubic Millin approach offers several superior anatomical advantages over the transvesical Freyer approach [1]:

- **Optimal Direct Visualization:** By incising the anterior prostatic capsule directly (transverse capsulotomy), the surgeon has an unparalleled view of the prostatic apex, the urethra, and the exact plane between the adenoma and the surgical capsule, minimizing the risk of sphincter injury.[8]
- **Direct Hemostatic Control:** Millin's approach allows the surgeon to directly visualize and suture the prostatic pedicles and any bleeding vessels within the enucleated fossa, avoiding the blind packing or heavy traction sutures required in transvesical procedures.[8]
- **Sparing of Bladder Integrity:** Because the urinary bladder is not incised, the incidence of postoperative bladder spasms, urinoma formation, and persistent suprapubic urinary leaks is significantly lower, leading to a faster and more comfortable recovery.[8]

Endourethral Reconstruction and the Sachse Technique

The presence of a coexisting bulbar-membranous urethral stricture in a patient scheduled for an open simple prostatectomy presents a significant clinical challenge. Urethral strictures in this cohort are frequently iatrogenic, arising from mucosal trauma during prior transurethral surgeries, such as the patient's previous TURP. Attempting to pass large-caliber catheters or instruments through an active stricture during a major open prostatectomy is highly dangerous, as it can cause complete urethral disruption, severe bleeding, and false passage formation into the preperitoneal space.[37]

The integration of a Sachse direct vision internal urethrotomy (DVIU) as the initial step in this patient's surgical management was highly strategic. Developed by Sachse in 1971/1974, this technique utilizes a sharp cold blade to incise the scar tissue under direct vision, typically at the 12 o'clock position to avoid injury to the deep bulbar vessels and the erectile structures.[0] By endoscopically resolving the stricture before starting the laparotomy, the clinical team secured a patent urethral channel. This allowed the safe placement of retrograde ureteral catheters and a postoperative 22-Fr three-way irrigation catheter, which was essential to prevent clot retention in the prostatic fossa.

Upper Urinary Tract Reconstruction and Ureteroneocystostomy

The requirement for a unilateral ureteroneocystostomy in this patient was directly caused by the chronic, compressive effects of the GPH mass.

In patients with massive prostatic enlargement, upper urinary tract deterioration and hydronephrosis can develop through two distinct pathophysiological mechanisms [5]:

1. **Direct Mechanical Compression:** The massive adenoma expands superiorly into the retrovesical space, directly compressing the distal ureter and the ureterovesical junction (UVJ), leading to mechanical obstruction and hydroureteronephrosis.[5]
2. **Functional UVJ Obstruction:** Severe, chronic detrusor muscle hypertrophy, occurring as a compensatory response to bladder outlet obstruction, increases intravesical pressure and leads to functional compression of the intramural ureteral segment.[5]

During the open enucleation of a highly adherent GPH mass, the compressed distal ureter is at extreme risk of accidental transection, thermal injury, or devascularization.[8] By placing retrograde ureteral catheters at the start of the procedure, the surgical team obtained clear tactile and visual landmarks, allowing them to dissect the retrovesical mass safely. Once the distal left ureteral segment was found to be chronically fibrotic and structurally compromised, performing a primary ureteroneocystostomy was the most definitive and safe option. Replanting the healthy proximal end of the left ureter into the bladder dome through a non-refluxing submucosal tunnel completely resolved the

postrenal obstruction and prevented postoperative urinary leaks or stricture recurrence.[1]

Cardiopulmonary and Anesthetic Optimization in High-Risk Patients

Anesthetic management for GPH surgeries in geriatric patients with severe cardiac dysfunction—such as CHF with a low cardiac ejection fraction—requires careful hemodynamic monitoring. The choice of open retropubic prostatectomy over laparoscopic or robot-assisted simple prostatectomy (RASP) in this patient was highly deliberate. Laparoscopic and robotic urological procedures require a steep Trendelenburg position (often >30º) and a high-pressure carbon dioxide pneumoperitoneum (12 to 15 mmHg) to achieve adequate pelvic visualization.[6]

In a patient with severe left ventricular dilatation and low EF, these interventions can dramatically increase systemic vascular resistance, decrease venous return, and severely impair cardiac output, precipitating acute intraoperative congestive heart failure and pulmonary edema.[6] Open retropubic prostatectomy is performed in a supine position with minimal hyperextension, avoiding these cardiopulmonary hazards.[8] However, the open approach is historically associated with a higher risk of intraoperative blood loss.[6]

In a patient with severe CHF, sudden blood loss can trigger myocardial ischemia or acute cardiac decompensation.[8] Therefore, the rapid, precise dissection facilitated by Millin's approach, combined with the pre-ligation of the prostatic pedicles, is crucial to minimize blood loss and avoid blood transfusions, which can cause volume overload in cardiac patients.[8] Postoperatively, continuous bladder irrigation must be closely monitored to prevent excessive fluid absorption through the open prostatic venous sinuses, which can cause rapid intravascular volume expansion and trigger congestive heart failure.[8]

Surgical Approach	Millin's Open Retropubic Prostatectomy	Robot-Assisted Simple Prostatectomy (RASP)	Freyer's Open Transvesical Prostatectomy
Hemodynamic Stress	Low (supine position, no pneumoperitoneum) [8]	High (steep Trendelenburg, CO2 pneumoperitoneum) [6]	Low (supine position, no pneumoperitoneum) [8]
Hemostatic Control	Excellent (direct visualization and pedicle ligation) [8]	Excellent (magnified 3D vision, robotic suturing) [43]	Moderate (blind enucleation, indirect hemostasis) [27]
Bladder Integrity	Spared (capsular incision) [8]	Variable (often requires cystotomy) [7]	Compromised (midline cystotomy required) [27]
Learning Curve	Short (well-established surgical technique) [1]	Long (requires robotic-assisted training) [1]	Short (standard open urological training) [17]
Postoperative Spasms	Minimal (bladder wall remains intact) [35]	Moderate (depending on transvesical access) [35]	High (due to direct mucosal irritation) [35]

CONCLUSION AND RECOMMENDATIONS

Conclusion

This case report demonstrates that giant prostatic hyperplasia (GPH) can present as a highly distorted, retrovesical pelvic mass that mimics advanced bladder or pelvic malignancies, presenting a significant diagnostic and therapeutic challenge.

The clinical findings of this case show that:

- For GPH with significant retrovesical expansion, Millin's retropubic simple prostatectomy is highly superior to transvesical approaches due to its direct capsular access, exceptional apical visualization, and direct control of the prostatic vascular supply, which minimizes blood loss and spares bladder integrity.[8]
- A concurrent urethral stricture must be endoscopically resolved via a direct vision internal urethrotomy (Sachse procedure) prior to starting open enucleation to ensure safe transurethral catheterization and facilitate continuous bladder irrigation.
- Bilateral ureteral catheterization is highly recommended as a protective guide during GPH enucleation; when the distal ureter is chronically compressed and compromised, a primary ureteroneocystostomy should be performed to secure long-term renal function.
- In geriatric patients with low-EF congestive heart failure, a single-stage open retropubic approach is a highly effective, definitive option that avoids the severe cardiac stress of prolonged pneumoperitoneum and steep Trendelenburg positioning associated with minimally invasive routes, provided that strict

cardiac optimization and fluid balance are maintained.

Recommendations

Based on the successful outcomes of this complex case, the following clinical recommendations are proposed:

1. **Preoperative Multimodal Mapping:** For pelvic masses of suspected prostatic origin, a combination of high-resolution contrast-enhanced CT, pelvic MRI, and optical cystoscopy should be routinely performed to identify concurrent upper and lower urinary tract abnormalities, such as urethral strictures and distal ureteral mechanical compression.
2. **Single-Stage Integrated Reconstruction:** When managing GPH associated with secondary complications, urologists should prioritize a synchronized, single-stage surgical design (Sachse DVIU → retrograde stenting → prostatectomy → ureteroneocystostomy) over staged procedures, as this significantly reduces the cumulative risks of multiple anesthetic exposures, hospital-acquired infections, and patient morbidity.
3. **Anesthetic Customization:** In geriatric patients with severe cardiac limitations (such as low EF), the surgical team should select the open extraperitoneal retropubic route rather than minimally invasive laparoscopic or robotic platforms to avoid the life-threatening hemodynamic challenges of pneumoperitoneum and steep Trendelenburg positioning.[6]
4. **Future Clinical Research:** Given the extreme rarity of GPH, there is a clear need for multicenter registries to collect and analyze patient data. Prospective randomized controlled trials comparing the long-term functional outcomes, complications, and cost-effectiveness of open suprapubic versus retropubic simple prostatectomy for glands > 500 g are highly recommended to establish definitive, evidence-based surgical guidelines

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