



## Oncology

## Exophytic benign prostatic hyperplasia presenting as a polycystic pelvic mass

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## ABSTRACT

We report a case of an exophytic benign prostatic hyperplasia presenting as a polycystic pelvic mass. A 69-year-old man presented with an incidental finding of a pelvic mass of over 18 years. Digital rectal examination revealed a mass on the right anterior rectal wall 8 cm from the anal opening. His current prostate-specific antigen was 3.187 ng/mL. Enhanced computed tomography and magnetic resonance imaging demonstrated an occupancy in the right pelvis. A laparoscopic resection of the pelvic tumor was performed and pathologists identified it as an exophytic benign prostatic hyperplasia nodule. No significant recurrence was found at the 6-month follow-up.

## Introduction

According to broad consensus, benign prostatic hyperplasia (BPH) is the most common benign urinary disorder in middle-aged and older men.<sup>1</sup> Compared with the Western populations, Asians seem to be more prone to developing moderate-to-severe BPH-related symptoms, such as lower urinary tract symptoms (LUTS).<sup>2</sup> Traditionally, the spotlight concerning where hyperplastic nodules originate has always been put on the central zone, transition zone (TZ) or even peripheral zone (PZ).<sup>3</sup> However, BPH in the form of exophytic nodules has rarely been reported. Here, we present an unusual case of an exophytic BPH nodule in the form of a pelvic mass.

## Case report

A 69-year-old man presented to our urology outpatient department with complaints of an incidental finding of a pelvic mass of over 18 years. A puncture biopsy of the mass was performed and pathological findings confirmed BPH. The patient had a history of hyperuricemia, and the control of uric acid was satisfactory after febuxostat treatment. Digital rectal examination (DRE) revealed a smooth and hard mass that could be palpated on the right anterior rectal wall 8 cm from the anal opening. The former prostate-specific antigen (PSA) level was not

verifiable but was clearly less than 4.0 ng/mL, whereas his current PSA was 3.187 ng/mL. Both enhanced computed tomography (CT) and magnetic resonance imaging (MRI) of the pelvic cavity demonstrated an occupancy in the right pelvis (Figs. 1 and 2).

A transabdominal approach was selected for exploratory surgery on June 30th and we found a well-encapsulated spherical 8\*5\*5 cm tumor on the right side of the urinary bladder and the prostate. The tumor was completely resected under laparoscopic surgery. Dense connective tissues connected the tumor to the apex of the prostate (Fig. 3). Macroscopically, the focal area was multifocal and cystic, and the tumor appeared grayish-yellow in cross-section. Based on the immunohistochemistry results, pathologists confirmed it as an exophytic BPH nodule with cystic dilatation of some glands and papillary hyperplasia (Fig. 4). No significant recurrence was found at the 6-month follow-up after surgery. There were no complaints of LUTS.

## Discussion

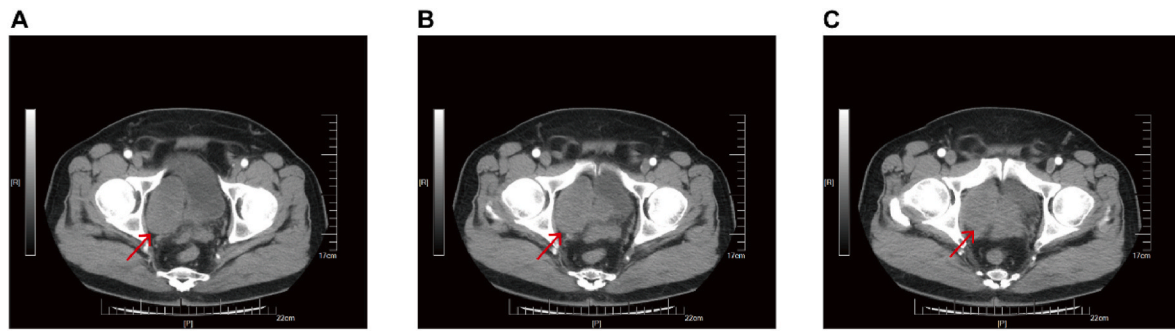
Detrusor overactivity (DO) is one of the clearly proven causes of LUTS and is highly relevant to the storage symptoms. Previous studies suggest that bladder outlet obstruction (BOO) is an independent etiology of DO.<sup>4</sup> Given that BPH is purely a histological concept, benign prostatic enlargement (BPE) plays a direct role in the effect of BOO, termed

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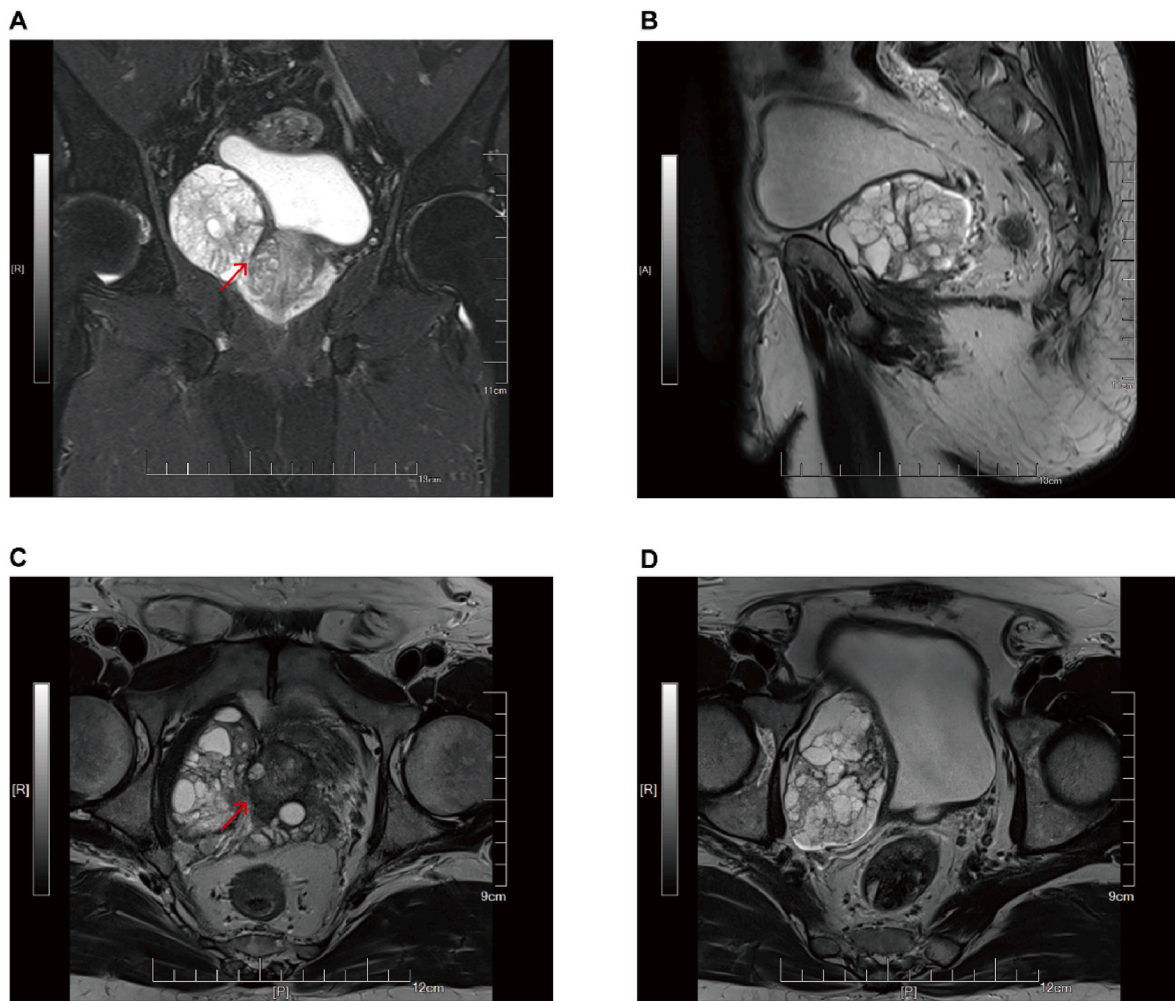
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**Fig. 1.** An enhanced computed tomography of the abdomen and pelvis demonstrated a soft spherical tissue density shadow (**A, B and C**) in the right pelvis (arrow), located to the right of the bladder and above the prostate. The density of the mass was inhomogeneous and the enhancement scan showed mild enhancement.



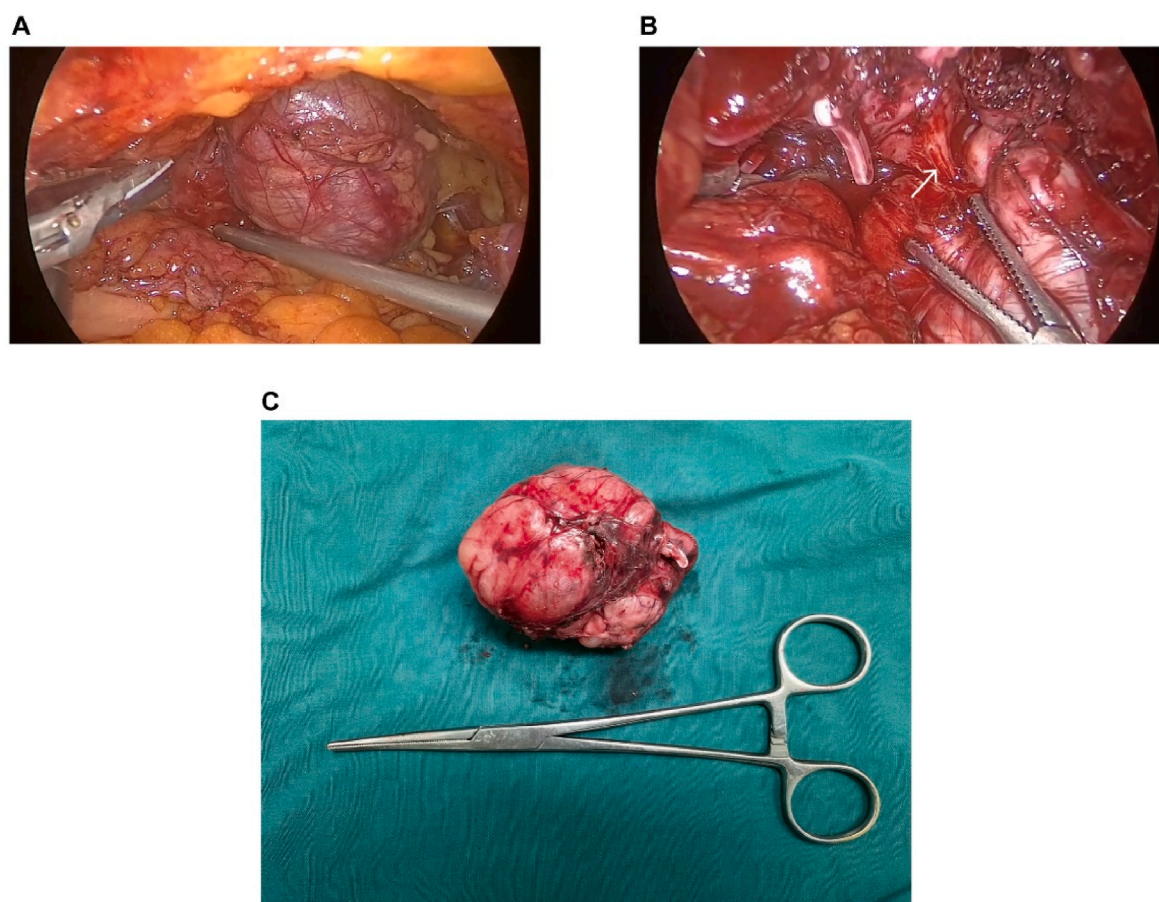
**Fig. 2.** A multi-parametric magnetic resonance imaging of the prostate demonstrated a mixed T2 signal on the right side of the pelvis, measuring approximately 7.6\*4.5\*4.4 cm. (**A, B and C**) are coronal, sagittal and horizontal images, respectively. The envelope was intact, the border was clear, and the mass was predominantly multifocal and cystic. It was in continuity with the prostate (arrow) and the bladder was compressed. The prostate was enlarged, measuring about 5\*3.7\*4.4 cm.

benign prostatic obstruction (BPO).<sup>1</sup> Common BPE is morphologically characterized as a diffuse increase in the size of the TZ, consisting of multiple nodules.<sup>5</sup> The enlargement of prostatic stromal and epithelial cells results in posterior urethral compression, and thus aggravates BOO, leading to voiding symptoms.<sup>6</sup> In our case, although the right partial bladder was compressed and the bladder volume was significantly reduced, the patient did not experience obvious LUTS. Our hypothesis is based on the following opinion: Although the exophytic BPH mass is a

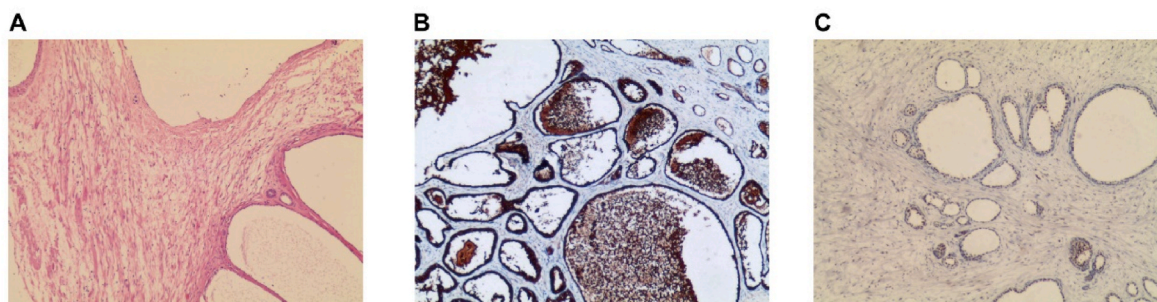
benign hyperplasia like the common BPE, histologically, the apparently enlarged nodule mostly grows towards the outside of the prostate instead of compressing the urethra. Since no BOO and relevant functional interference of the detrusor was observed, this explains the absence of LUTS.

In this case, although preoperative MRI results highly suggested a benign mass based on the imaging features, the total PSA had not yet reached a dangerous level and postoperative pathology did confirm a





**Fig. 3.** During laparoscopic exploration, (A) a mass was found on the right side of the pelvis, (C) appearing off-white with a distinct and intact envelope. (B) It was located on the right side of the bladder and the prostate and was in continuity with the apex of the prostate (arrow).



**Fig. 4.** The postoperative pathology demonstrated an exophytic benign prostatic hyperplasia nodule with (A, B and C) cystic dilatation of some glands and papillary hyperplasia. Immunohistochemistry suggested: androgen receptor (+), PSA (+), P504S (–), cytokeratin (CK)7 (+), CK5/6 (basal cells+), P63 (basal cells+), smooth muscle actin (scattered+), Ki-67 (5 %+), and CD34 (–).

benign disorder, the most important limitation was that whether the mass was benign or malignant was not clarified again by the gold standard “puncture biopsy” before the surgery. An overlap objectively exists in the clinical history and imaging findings associated with miscellaneous idiopathic prostatic disorders, and biopsy is required for ultimate confirmation of diagnosis.<sup>7</sup> If the result was malignant, simple resection of the exophytic mass might be insufficient and a systematic treatment program for prostate cancer or other categories of malignant tumors was needed. Moreover, owing to the lack of medication attempts, it is unknown whether 5- $\alpha$  reductase inhibitors could decrease the size of the exophytic BPH nodule just as in BPE.

Unfortunately, very little is known about exophytic BPH and to date,

few case reports have been published to explore this area. Therefore, our case is rare and informative for future studies. In 2011, Blaschko and Eisenberg described a multilobular mass (posterior to the urinary bladder and in continuity with the prostate), which was confirmed to originate from the prostate by the needle aspiration.<sup>8</sup> Likewise, the patient had no complains of LUTS, which was why he chose conservative observation instead of surgery. Nevertheless, only an enhanced CT examination was performed without further MRI of the prostate. MRI significantly improves the ability to distinguish common abnormalities of the prostate; however, exophytic BPH is an uncommon disease of the prostate, which made the Prostate Imaging Reporting and Data System version 2.1 assessment unsuitable for this case.<sup>9</sup> In 2018, Khanna

reported a case of exophytic BPH presenting as a well-defined pelvic mass that was adjacent to the prostate. Transrectal biopsy confirmed BPH and a robot-assisted excision of the mass was performed.<sup>10</sup> Unlike our client, the patient complained of significant LUTS and refractory urinary retention. According to the intraoperative view, the bladder neck compressed by the mass might explain the presence of LUTS. The patient's voiding well after the surgery was therefore a predictable prognosis.

Furthermore, where these hyperplastic nodules originate from remains unknown. Tang's study suggested that the immunohistochemical characteristics of hyperplastic nodules in the TZ differed from those in the PZ and some BPH nodules in the PZ could also originate from the PZ.<sup>3</sup> Meanwhile, some scholars agreed that hyperplastic nodules in the PZ might be exophytic BPH in the TZ or the migration of ectopic TZ tissue into the PZ.<sup>11</sup> Based on MRI findings, the pelvic mass in our case was more inclined to originate from the TZ. Further immunohistochemical examinations are required to confirm the zone of origin by comparing the pelvic mass with nodules that originate from the TZ or PZ. Hence, the future direction of this research should focus on the origin and growth mechanism of exophytic BPH nodules.

## Conclusion

Careful and thorough examinations, especially MRI, PSA test and biopsy, are vital for the diagnosis of exophytic BPH. Once the diagnosis is confirmed, the treatment strategy is more focused on relieving the patient's clinical symptoms. Severe symptoms and reduced quality of life caused by the occupying effect of the mass require a surgical excision of the mass.

## Author contributions

Shuang Xu and Tao Guo contributed equally to this work. Conceptualization: Shuang Xu, Tao Guo, Jianglei Zhang, Jun Zhang, Zhiyu Zhang, Yuhua Huang, Can Hu, Haoyang Zhang, Zhen Song, Chao Wang, Jun Ouyang. Investigation: Shuang Xu, Tao Guo and Chao Wang. Writing - original draft: Shuang Xu, Tao Guo and Jun Zhang. Writing - review & editing: Shuang Xu and Tao Guo. Funding acquisition: Jun Ouyang.

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## Ethics approval and consent to participate

The patient provided written informed consent for the use of the report.

## Consent for publication

Not applicable.

## Declaration of competing interest

The authors declare that they have no competing interests.

## Acknowledgements

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