



## Mucinous Metaplasia in Benign Prostate Tissue

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### Abstract

Metaplasia is defined as change that is reversible, wherein one differentiated cell type is replaced by another type of adult cell. This may represent an adaptive process of cells to withstand the stressful environment. It is very important to recognize this rare finding so as to differentiate the presence of mucinous metaplasia in benign hyperplasia of prostate from metastases of intestinal malignancy. We present one such rare case in a 70-year-old male with moderate prostatomegaly and a lesion arising from the prostate extending to the base of bladder on ultrasonography. Histopathology revealed benign prostatic tissue with mucinous metaplasia which was confirmed by special stains for mucin like mucicarmine and PAS stain.

**Keywords:** Mucinous Metaplasia, Mucicarmine, Prostate, Periodic Acid Schiff;

### INTRODUCTION

Mucinous metaplasia is said to be one of the least common of all metaplasia occurring in prostate. Other types of metaplasia include squamous cell and transitional cell. Histopathology sections show presence of columnar mucin filled cells with foamy cytoplasm, tiny dark basally located nuclei. The significance of mucins present in benign and malignant lesions is still under review. Mucin is mostly seen in the lumen of the prostatic acini, luminal lining surface of cells and rarely in cytoplasm of cells. The cytoplasm of these cells stain positive for mucicarmine, alcian blue (AB) and periodic acid Schiff (PAS) indicating the presence of both neutral and acidic mucins.<sup>[1]</sup>

It is critical to identify mucinous metaplasia which can be easily overlooked on sections stained with haematoxylin and eosin (H&E), by using special stains like PAS and mucicarmine.

### CASE REPORT:

A 70-year-old man presented with complaints of burning micturition for one month along with painful micturition and dribbling of urine for 15 days. Ultrasonography revealed moderately enlarged prostate gland measuring 4.7x4.2x3.6 with a volume of 40 cc along with a significant postvoid residue of 300 cc. Hypertrophy of median lobe was noted with a heterogeneously hyperechoic lesion measuring 3.3x2.4 cm arising from the prostate to the base of the bladder. Additionally, urinary bladder showed a mobile large vesicle calculus measuring 40mm, causing resultant moderate hydronephrosis and hydroureter. His serum PSA was 14.8ng/ml (normal level – 4ng/ml).

A transrectal ultrasound-guided biopsy of the prostate was performed. The received biopsy was fixed in 10% formalin and all tissue was processed. The sections were cut at 3–5-micron thickness and subsequently stained by haematoxylin and eosin stain.

Microscopic examination revealed multiple prostatic tissue bits displaying predominantly fibromuscular hyperplasia and foci of compressed prostatic ducts and acini. These were lined by inner epithelial and outer myoepithelial layer. Few areas of mucinous metaplasia showed groups of columnar cells with clear to foamy cytoplasm with small, dark basally located nuclei. The cytoplasm of metaplastic cells stained positively for PAS and mucicarmine both. There was no evidence of any atypia or malignancy. Special stains used were Periodic acid Schiff (PAS) for neutral mucin and mucicarmine for acid mucin.

## DISCUSSION:

Metaplasia is thought to arise by genetic reprogramming of stem cells rather than trans differentiation of already differentiated cells. Mucous gland metaplasia is seen in 1% of the prostates. Based on previous studies it was suspected that it is not as rare as suggested by these reports and may be confused with prostatic adenocarcinoma or metastases from the intestine in biopsies.<sup>[1,2]</sup>

Squamous and transitional cell metaplasia are relatively common and are due to infections, trauma, infarcts or in men on estrogen therapy.<sup>[3]</sup> The presence of mucin-filled cells is, however, not a feature of normal prostate.<sup>[1]</sup> Mucinous metaplasia was described in the stomach, gall bladder and pancreas.<sup>[2]</sup> This is usually seen to be associated with both normal prostate and prostatic hyperplasia.<sup>[1]</sup> It was earlier described as a rare lesion.<sup>[4,5]</sup> However, the study by gal et al indicates that it is more frequent as it was found in more than 30 % of specimens when examined by special stains for mucins.<sup>[2]</sup>

In our case the patient was a 70-year-old male, whereas in a study by Alireza et al the age range was 57 to 84 years with mean age of 65.2 years.<sup>[3]</sup> In contrast to our case their study had incidence of metaplasia in benign hyperplasia of prostate in lower ages. In case report by Archana et al mucinous metaplasia was seen in a 62-year-old male with transitional cell carcinoma.<sup>[1]</sup> A study by gal et al included both normal and hyperplastic prostates. Normal prostates of 11 subjects were removed during postmortem examination with an age range of 17-79 years and a median age of 45 years. Specimens of prostatic hyperplasia were obtained from 10 patients in the age range of 61 to 82 years with a median age of 70.2 years, similar to our case.<sup>[2]</sup>

The serum prostate specific antigen (PSA) levels in our case were mildly increased 14.8ng/ml as compared to the serum PSA levels in a case report by Archana et al which was 28.1 ng/ml.<sup>[1]</sup> This shows that in metaplastic lesions of the prostate with BPH the serum PSA does not increase like in malignant lesions.

In the present case report both neutral and acidic mucins were found as indicated by PAS and mucicarmine positivity. Similar findings were observed in a study by gal et al and were said to be resembling incomplete intestinal metaplasia seen in stomach.<sup>[2,6]</sup> Whereas, in stomach, intestinal metaplasia is thought to be a premalignant change, but no areas of such a change were found near the areas of mucinous metaplasia of the prostate in our case similar to the study by gal et al.<sup>[2]</sup>

The resemblance of mucinous metaplasia to the Cowper's glands was differentiated by their lectin-binding profiles.<sup>[2]</sup>

It is said that the presence of mucinous metaplasia mainly around urethra and particularly in the inferior region could be associated with some embryonal remnant like the prostatic utricle, also termed the vagina masculine, which is the termination of the Mullerian cord and is known to undergo metaplasia in the female.<sup>[2,7]</sup>

The possibility of association with mucinous carcinoma remains to be investigated as one case of primary prostatic signet-ring cell carcinoma associated with intestinal metaplasia involving the prostatic urethra was reported.<sup>[2,8]</sup>

It is said that the mucin is not seen in the lumen of the prostatic acini as it is mixed and diluted with the prostatic fluid and evacuated through the prostatic ducts.<sup>[2]</sup>

## CONCLUSION:

The significance of identifying mucous gland metaplasia lies in differentiating it from other lesions like low grade prostate adenocarcinoma and metastases from intestine especially in biopsies. Therefore, this entity needs to be recognized to avoid unnecessary further investigation.

## REFERENCES

1. Patil AA, Mahajan SV, Wadgaonkar AR. Presence of Mucinous Metaplasia in a Primary Transitional Cell Carcinoma Prostate Study.

2. Gal R, Koren R, Nofech-Mozes S, Mukamel E, His Y, Zajdel L. Evaluation of mucinous metaplasia of the prostate gland by mucin histochemistry. *British journal of urology*. 1996 Jan;77(1):113-7.
3. A Abdollahi, M Ayati. Frequency and outcome of metaplasia in needle biopsies of prostate and its relation with clinical findings. *Urol J*, 6 (2009), p. 109-113.
4. Grignon DJ, O'Malley FP. Mucinous metaplasia in the prostate gland. *The American journal of surgical pathology*. 1993 Mar 1;17(3):287-90.
5. Shiraishi T, Kusano I, Watanabe M, Yatani R, Liu PI. Mucous gland metaplasia of the prostate. *The American journal of surgical pathology*. 1993 Jun 1;17(6):618-22.
6. Jass JR, Filipe MI. The mucin profiles of normal gastric mucosa, intestinal metaplasia and its variants and gastric carcinoma. *The Histochemical journal*. 1981 Nov 1;13(6):931-9.
7. Lauchlan SC. Metaplasias and neoplasias of Müllerian epithelium. *Histopathology*. 1984 Jul;8(4):543-57.
8. Skodras G, Wang J, Kragel PJ. Primary prostatic signet ring cell carcinoma. *Urology*. 1993 Sep 1;42(3):338-42.

Figure 1: Mucinous metaplasia of prostate glands showing foamy cytoplasm (H&E 400x).

Figure 2: Magenta pink intracytoplasmic-mucin filled prostate glands seen in a section stained with Periodic acid-Schiff (PAS 400x).

Figure 3: Mucinous metaplasia of prostate glands showing pink intracytoplasmic and intraluminal mucin (mucicarmine stain 400x).



