

FINE NEEDLE ASPIRATION CYTOLOGY OF PROSTATIC LESIONS WITH HISTOLOGIC CORRELATION

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Abstract

Cytologic diagnosis by fine needle aspiration of the prostate was compared to histological diagnosis by either core biopsy or transurethral prostatic resection in 58 patients suspected to have prostatic lesion by rectal examination. The diagnostic accuracy between cytological and histological diagnosis was 93% and the false negative rate was 3.03% for fine needle aspiration. Inadequate cytological samples occurred only in two cases. This study was conducted during the period of April 2003 to February 2004. Fine needle aspiration cytology of prostatic lesions is a recently introduced procedure in Bangladesh. Our results indicate that fine needle aspiration is an easily performed, diagnostically reliable outpatient procedure with minimal complication.

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Introduction

Several techniques have been developed to remove an adequate amount of tissue for histologic and cytologic examination. For years digitally guided biopsy of the prostate using the Tru-cut needle has been the method of choice. Studies have shown that in the hands of experienced cytopathologists, fine needle aspiration biopsy (FNAB) may be as helpful as core biopsy¹. The complication rate is lower than with large-bore core biopsies, and the patient experiences less discomfort.

Fine needle aspiration biopsy of prostate is exclusively used in Scandinavian countries and in recent years it is also widely practiced in United Kingdom and United States of America. This study was undertaken with the aim to evaluate the effectiveness of transrectal fine needle aspiration cytology in the diagnosis of prostatic lesions and to determine the cytomorphological features of prostatic lesions.



Fig. 1: Technique of FNA by modified Franzen's device (A- Finger cot, B- Syringe and Spinal needle).

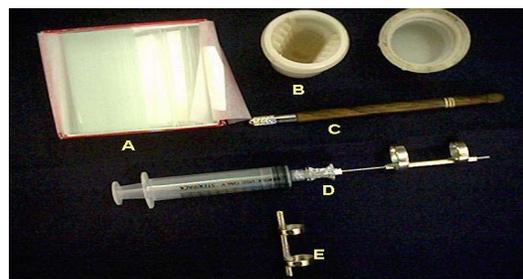


Fig. 2: Franzen's device, A - Glass slides, B - Cophilin jar, C - Diamond pencil, D- Spinal needle, Syringe, Finger guide, E -Finger cot.

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Materials and Methods

The FNAB method, first described by Franzen in 1960 has remain unchanged to date². With the aid of a guide rail attached to the index finger, it is possible to puncture the prostate with a thin scraper needle (diameter, 0.6 mm). The needle tip is moved rapidly back and forth (10 - 15 times) within the suspected area in order to procure cellular material. In this study, the basic equipments required for FNAC are flexible 23 to 25 gauge disposable spinal needles (Spinocain) and finger guide (Replica of Franzen finger cot, locally made). The material collected is smeared thinly onto a glass slide, fixed with alcohol fixative and stained according to a modification of the Papanicolaou staining procedure.

The study was conducted in the department of Pathology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period of April 2003 to February 2004. Male patients of age above 40 years with enlarged prostate were selected from the Department of Urology of BSMMU, Dhaka Medical College and Hospital, Bangladesh Medical College and Hospital and private clinics in Dhaka. A total of 62 patients were selected with an aim to obtain rapid diagnosis of prostatic lesions by FNAC and to study the cytomorphological features of prostatic lesions. The specimens obtained from the same patients for histopathological examination were adequate in 58 out of the 62 cases. Among the 58 patients, transurethral resection of prostate (TURP) was done in 51 cases and transrectal needle biopsy was done in the remaining 7 cases. Patients with acute prostatitis were not included in this study because of the risk of developing septicemia. Patients with any complication such as inflamed haemorrhoids or fistula were also not included in this study.

Results

A total of 62 selected patients underwent fine needle aspiration of the enlarged prostate. FNAC was carried out with the help of 10 ml disposable plastic syringe with attached 23-25 gauge spinal needle under guidance of finger cot in all cases. Smears were stained with Papanicolaou's stain. In only two cases, the smears were inadequate. Biopsy for histopathological examination was available in 58 cases.

Table 1

Cytopathological diagnosis of 62 cases of prostatic lesions.

FNAC	Number of patients	Percentage
Benign lesions (n=36)		58.06
Nodular hyperplasia	32	51.61
Atypical hyperplasia	3	4.84
Nodular hyperplasia with squamous metaplasia	1	1.61
Malignant tumours (n=21)		33.9
Adenocarcinoma	19	30.65
Adenosquamous	1	1.61
Metastatic transitional cell carcinoma	1	1.61
Suspicious cells	3	4.84
Inadequate	2	3.22
Total	62	100.00

Of the 62 cases satisfactory smears were obtained in 60 (96.77%) cases. The most common lesion was nodular hyperplasia (n= 32, 51.6%), 3 cases (4.8%) were atypical hyperplasia of prostate, 1(1.6%) case was nodular hyperplasia with squamous metaplasia and the total number of malignant tumour diagnosed cytologically were 21 (33.87%) cases. Three cases (4.8%) were diagnosed as suspicious for malignancy. Smears were inadequate in 2 (3.2%) cases, where no conclusive diagnosis could be given. Out of 21 prostatic carcinoma 19 cases were adenocarcinoma, one case was adenosquamous and one case was diagnosed as metastatic transitional cell carcinoma.

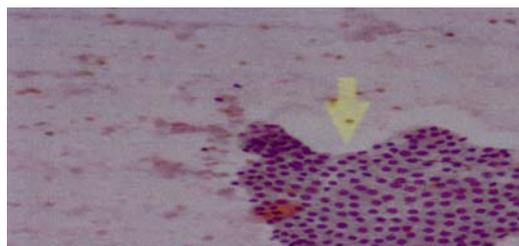


Fig.3: Photomicrograph shows smear preparation of nodular hyperplasia

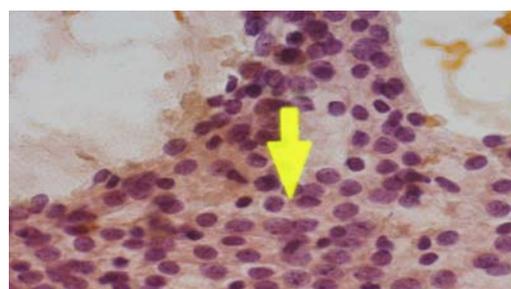


Fig.4: Photomicrograph shows smear preparation of atypical hyperplasia

Table 2
Histopathological correlation of cytologic findings in 58 cases.

Histopathological Diagnosis	Number of patients	FNA cytological Diagnosis	N(%)
Nodular hyperplasia	38	Nodular Hyperplasia	34(89.47%)
		Atypical Hyperplasia	1(2.66%)
		Carcinoma	3(7.84%)
Atypical hyperplasia	2	Atypical Hyperplasia	2(100%)
Carcinoma	18	Carcinoma	17(94.44%)
		Nodular Hyperplasia	1(5.55%)
Total	58		58

Biopsy specimen were available in 58 cases. Of them, 38 cases were diagnosed as nodular hyperplasia, 2 cases as atypical hyperplasia and 18 cases as carcinoma. Among the 38 benign cases, 34 cases were correctly diagnosed cytologically as nodular hyperplasia but in the remaining 4 cases, 3 cases were diagnosed as carcinoma and one case as atypical hyperplasia. Both cases of atypical hyperplasia were correctly diagnosed by cytology with 100% correlation.

For benign lesions (both nodular hyperplasia and atypical hyperplasia), the diagnostic accuracy was 92.10% (35 of 38 cases). Out of the 18 histopathologically diagnosed cases of prostatic carcinoma, 17 cases were correctly diagnosed as carcinoma by cytology. One case was diagnosed as nodular hyperplasia. For malignant lesions, the diagnostic accuracy was 94% (17 of 18 cases).

The sensitivity of this study is 94% and specificity is 92%.

Discussion

The purpose of this study was to determine the accuracy of FNAC in the diagnosis of prostatic lesions. Prostatic carcinoma is one of the important cause of cancer death in elderly men. Because potentially curable prostatic cancer produce no symptoms, majority of the patients seek medical attention only after the onset of symptoms related to advanced or metastatic disease. Therefore high rate of mortality from prostatic cancer may be due to late detection. Recent studies show transrectal FNAC is a useful technique for detection of prostatic cancer. As the technique is simple and do not require admission in hospital, it may be employed to detect occult or early prostatic cancer in elderly males.

Prostatic cancer is often localized to the peripheral part of the gland, especially the posterior lobe but also the lateral lobes. It is therefore accessible to transrectal puncture biopsy. The instrument is directed towards the suspected part of the prostate. With experience it is seldom difficult to reach a suspicious area in the posterior part of the prostate by fine needle. On the other hand, if the lesion is central or situated near the floor of the bladder, it may be more readily accessible with a fine needle.

Cytologic diagnosis of prostatic lesions can confirm the clinical impression. At best the opinion rendered can be equivalent to tissue diagnosis. Unfortunately few studies have been done in this field and information available is small. A review of the literature revealed few papers whose results were very encouraging. Malograna and associates showed 91% correlation between aspiration biopsy, and no false positive diagnosis². In review of 3,002 transrectal aspiration biopsy of prostate, complication rate was in 12 (0.4%) cases³.

In this study of 62 cases, satisfactory smears were obtained in 60 cases (96.77%) and in two cases (3.22%) smears were inadequate. A review of literature revealed that inadequate smears were obtained in many of the studies.

Out of 62 cases, histological diagnosis were available in 58 cases. In this study 33 cases (53.22%) were cytologically diagnosed as nodular hyperplasia. Histopathology of these 33 cases showed concordance in 32 cases and discordance in one case which was diagnosed as carcinoma of prostate leading to one false negative diagnosis (3.03%). The discrepancies between histological and cytological findings may be explained by sampling of different sites, since carcinoma of the prostate may be focal and FNA obtained may not include the involved sites.

In this study, 21 (33.87%) cases were diagnosed cytologically as carcinoma of prostate. Out of these 21 cases, one case as metastatic transitional cell carcinoma, one case as adenosquamous carcinoma and 19 cases were diagnosed as adenocarcinoma. Biopsy was available in 18 cases. Out of these 18 cases, 17 cases were diagnosed as carcinoma histologically and 1 case was diagnosed as nodular hyperplasia. The concordance rate in the present study and the other studies are similar in case of carcinoma of prostate. Cytologic features in this study also agreed with Lin et al.⁴.

Franzen's instrument injures the prostate and capsule less than Tru-cut biopsy. Puncture of apical or periurethral lesions with Franzen's needle involves no risk of injury to the urethra, while a punch biopsy needle may occasionally remove pieces of the urethral mucosa, as is apparent from pathologist's report. On the other hand, fine needle aspiration may carry a greater risk of infection if performed transrectally. But in previously reported series⁵ and in our cases no such complication was observed.

Conclusion

In our country the incidence of prostatic diseases, both carcinoma and nodular hyperplasia, is increasing with the demographic shift to longevity. With increased awareness of the clinical significance of prostate cancer and the advances made in surgical treatment, there is renewed clinical interest in attempting to identify patients with surgically curable disease. FNAC of prostate is of great importance as it helps the urologist to take proper decision about surgery. It is useful in distinguishing between benign and malignant lesions of prostate. No appreciable complications have occurred with this technique except mild discomfort and pain in some cases.

In conclusion, the present study indicates that fine needle aspiration of the prostate is rapid, safe and efficient. It can be utilized without fear of complication as an office procedure, and should be used as a primary tool in the diagnosis of prostatic carcinoma.

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