

# Fine Needle Aspiration Biopsy Cytology In The Diagnosis Of Prostate Cancer - A Nigerian Hospital Experience.

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**Objective:** To assess the efficacy of Fine Needle Aspiration Biopsy Cytology (FNABC) in the diagnosis of prostate cancer.

**Patients and Methods:** All patients that were admitted for transperineal core needle biopsy of the prostate were also offered trans-rectal fine needle aspiration biopsy (FNAB) as a preceding procedure. The report of the FNABC was then compared with the histopathology report from the core needle biopsy – which was used as the control.

**Results:** 41 patients were involved in the study. All had trans-rectal FNAB followed by transperineal trucut needle biopsy. 33 (80.5%) of the FNAB smears were reported as adequate. The FNABC had a specificity of 100% and sensitivity of 95.4% and a positive predictive value (PPV) of 100%. The average cost of the FNABC was 130 naira unlike 15,000 naira for the core needle biopsy.

**Conclusion:** FNABC is a cheap and dependable investigation for clinical decision making. Thus, in unequivocal malignant cytology reports, FNABC is reliable in establishing a diagnosis of prostate cancer (Ca-p) and management can be confidently made without resorting to core needle biopsy.

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**KEY WORDS:** Fine Needle Aspiration Biopsy, FNABC, Prostate Cancer.

## INTRODUCTION

Carcinoma of the prostate (Ca-p) is the most common malignant disease in men after the middle age<sup>1</sup>. Incidence is higher in blacks, and it is about 127/100,000 in Nigerian men<sup>2</sup>

The gold standard for the diagnosis of Ca-p has traditionally been histological using the core needle biopsy. In developing countries where cost and early diagnosis significantly affect the management of Ca-P, FNABC could be an effective tool. The cost of the trucut needle, the main instrument for core biopsies in Nigeria is about ten thousand naira (10,000 naira), whereas the cost of the eighty millimeter twenty three gauge (80mm 23G) needle and syringe, the main instruments for FNABC is about fifty (50) naira. In a country like Nigeria, with many people earning below the national

minimum wage of 5,500 naira per month, the need for cheaper means of diagnosis cannot be over emphasized

There are other advantages of FNABC. It may be performed with little or no analgesia. It is a less traumatic procedure which patients easily accept and can be repeated with minimal distress to the patient<sup>3,4,5</sup>. The result of FNABC is rapid, with results being available in 15 minutes in some reports, and thus can reduce the waiting period usually associated with core needle biopsy<sup>4,6,7</sup>.

Despite the promising results of FNABC of the prostate since its introduction by Ferguson, it is yet to gain world wide popularity except in Europe especially the Scandinavian countries<sup>4,6,7,8</sup>. We are not aware of any center in Nigeria that is currently practising FNABC on the prostate.<sup>1</sup>

In this study we set out to assess the usefulness of this procedure in the management of Ca-P patients at the Lagos University Teaching Hospital, Lagos, Nigeria

## MATERIALS AND METHODS

41 consecutive patients who were admitted for transperineal

trucut biopsy of the prostate over a period of 24 months (Jan 2000–Dec2001) were involved. Informed consent was obtained from the patients. All had trans-rectal FNAB which was then followed by trucut biopsy. The indication for biopsy was either a raised serum prostate specific antigen (PSA >4ng/ml), abnormal findings (suggestive of malignant disease) on digital Rectal Examination (DRE) or both. Size 23G, 80mm long needles (manufactured by Braun) were used for the aspiration with standard 20mls plastic syringes.

A disposable enema was given at the beginning and the patient put in a lithotomy position. Preliminary rectal examination was performed. 1-2 mls of xylocaine was infiltrated into the perianal skin using a 2mls syringe and needle. The 23G needle and 20cc syringe were connected and the needle introduced either directly into the anal canal or via the infiltrated perianal skin into the anal canal. The left index finger was introduced into the rectum just behind the tip of the needle to avoid injury. The same finger was used to guide the needle to the selected site on the prostate. Full suction was applied and the needle quickly moved back and forth several times with a rotating motion. The syringe is then detached from the needle [making sure that the negative pressure is still being maintained], with the needle still in situ. The needle is then withdrawn from the prostate and the aspirate (contents of the needle barrel) smeared on the glass with the aid of a syringe.

After this had been done satisfactorily, a transperineal trucut biopsy was then done under local or rarely regional

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anaesthesia. The cytology slides were then fixed with alcohol, transported to the laboratory for staining and then reported.

To eliminate bias. All the aspirations were evaluated by the cytologist without knowledge of findings obtained by the transperineal core biopsy. No clinical information was provided to the cytologist apart from the fact that the aspirates were from the prostate. According to the Royal College of Pathologists Scheme the smear was reported as malignant, suspicious, benign or unsatisfactory.

**Table 1: Correlation Between FNABC And Final Histological Diagnosis**

FNABC		Histopathology	
		Benign	Malignant
Benign	8	7 (TN)	1 (FN)
Malignant	21	0 (FP)	21 (TP)
Suspicious	4	0	4
Inadequate	8	6	2
<b>Total</b>	<b>41</b>	<b>13</b>	<b>28</b>
TP	-	True positive	
FP	-	False positive	
TN	-	True negative	
FN	-	False negative	

**Table 2: Validity Tests Of FNABC For Carcinoma of the Prostate**

Test	Value (%)
Sensitivity	95.4
Specificity	100
Overall diagnostic accuracy	96.6
PPV	100
NPV	87.5
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Sensitivity =	$\frac{TP}{TP + FN} \times 100\%$
Specificity =	$\frac{TN}{TN + FP} \times 100\%$
Overall diagnostic accuracy =	$\frac{TP + TN}{TP + TN + FP + FN} \times 100\%$
PPV =	$\frac{TP}{TP + FP} \times 100\%$
NPV =	$\frac{TN}{TN + FN} \times 100\%$

## RESULTS

A total of 41 patients had both FNAB and trucut biopsy. The following were the indications for biopsy: Abnormal findings on DRE—6 patients (14.6%). A raised PSA -14 patients (34.2%).

Both a raised P.S.A and abnormal DRE-21 patients (51.2%). In all, 28 cases were confirmed as malignant and 13 benign on histopathology.

Of all 41 smears were analysed, 21 smears were reported as malignant and all were confirmed as malignant on histopathology. 8 smears were reported as benign, 7 of which were confirmed as benign and one malignant on histology. 4 smears were reported as suspicious, all were confirmed as malignant on histopathology. 8 smears were reported as unsatisfactory out of which 6 were confirmed as benign and 2 as malignant on histopathology. (Table 1.)

The data were analysed using the EPINFO version 6 software and the following validity results calculated. Sensitivity 95.4%, specificity 100%, positive predictive value (PPV) 100%, negative predictive value (NPV) 87.5% and an overall diagnostic accuracy 96.6% (Table 2).

It took between three to ten days (mean 5.3 days  $\pm$  S.D 2.5) to obtain the FNABC reports while it took ten to thirty days (mean 17.3 days  $\pm$  S.D 4.4) to obtain histopathology reports. The average cost of carrying out FNABC was about 130 naira whereas the trucut needle biopsy averaged about 15,000 naira.

## DISCUSSION

The FNABC was well tolerated by all the patients. In the technique of FNABC described by Franzen, it is usually stated that there was need for a needle guide and no need for analgesia or anaesthesia<sup>3,7</sup>. However in some anxious patients, infiltration of the peri-anal skin with 1 to 2 mls of 1% xylocaine was found useful. In such patients the FNABC needle was introduced via the peri-anal skin (as close to the anal margin as possible) into the canal. Keeping the index finger constantly just behind the tip of the needle is essential when there is no Franzen's needle guide as in this study to prevent injury. It must be noted that there was no case of needle injury to the operator throughout the study.

The concept of FNABC of the prostate was first introduced by Ferguson in 1930, but popularity was credited to Franzen in the 60's<sup>3,7</sup>. The only clinical indication for prostatic FNABC is to confirm the presence of malignant cells in the prostate. FNABC in this study was more specific (100%) than sensitive (95.4%). It had a positive predictive value (PPV) of 100%, negative predictive value (NPV) of 87.5%, and an overall diagnostic accuracy of 96.6%. Many other reports support these findings<sup>3,4,7,8,9</sup>. The main implication of these findings is that while a negative FNABC does not absolutely exclude malignancy a positive (for malignant cells) result can be taken as a sound evidence of malignancy.

Even though immediate reporting was not done in this study, it was obvious that FNABC could have reduced the waiting period. Cytology reports were ready in an average of

5.3 days whereas histopathology reports took 17.3 days. Ideally the results of FNABC should be available within one hour as staining requires less than one hour. However with few cytopathologists and a heavy work load, the waiting period was longer. If immediate reporting is used, the sensitivity of FNABC can be improved since benign, suspicious or unsatisfactory smears can be repeated before the patients leaves the hospital. FNABC in good hands is therefore time saving. The difference in cost between FNABC and histopathology is enormous (130 to 15,000 naira). This is also the experience of many workers<sup>4,7</sup>. In a society where most patients live on less than 5,500 naira per month, the importance of this cannot be over emphasized.

Clinicians managing Ca-P have been slow to accept FNABC because of concerns about its diagnostic accuracy. However, the skill and experience both in performing the biopsy, preparation and reading of the smears are perhaps the greatest factors affecting diagnostic accuracy. A definite learning curve is involved. Accuracy is best when a fully trained aspirator and an experienced cyto- pathologist are involved. This has also been our experience.

In conclusion FNABC is simple, well tolerated by the patients, cheap and reliable in making a diagnosis of Ca-P. We however still recommend that centers wishing to commence FNABC of the prostate should endeavour to procure the needle guide so as to eliminate safety concerns to the surgeon.

#### REFERENCES

1. Yeboah E.D. The prostate gland in Badoe E. O, Archampong. E.Q, daRocha-Afodu J.T. (Ed) Principles and practice of Surgery Including Pathology In The

- Tropics. 3<sup>rd</sup> Edition. Ghana Publishing Corporation, Tema. 2000 (pp. 850–884).
2. Osegbe D.N. Prostatic cancer in Nigerians: Facts and non-facts. *J. Urol.* 1997; 157: 1340-1343.
3. Ekman H, Herdberg K, Persson S.P; Cytological versus histological Examination of Needle Biopsy Specimens in The Diagnosis of Prostatic Cancer. *Br. J. Urol.* 1967; 39: 544-548.
4. Hosking D.H, Paraskevas M, Hellsten O.R. et al. The cytological diagnosis of prostatic carcinoma by transrectal fine needle aspiration. *J.Urol.* 1983; 129:998-1000.
5. Ljung B.M, Cherrie R, Kaufman J.J. Fine Needle Aspiration biopsy of the prostate gland; a study of 103 cases with histological follow up. *J. Urol.* 1986; 135(5): 955-8 (Abstract)
6. Prabhu G.G, Rao M S, Venugopal N. Synchronously performed prostatic fine needle aspiration and core biopsies-an appraisal. *J. Post grad Med.* 1994; 40: 71-73.
7. Deliveliotis C.H, Stavropoulos N.J, Macrychoritis C. et al., Transrectal Needle Aspiration Versus Transperineal needle biopsy in the diagnosis Of prostatic carcinoma. *Int. Urol. Nephrol.* 1995; 27(2): 173-177.
8. Chodak G.W, Steinberg G.D, Bibbo M. et al. Role of transrectal Aspiration Biopsy in the diagnosis of Prostatic Cancer. *J. Urol.* 1986; 135:299-302.
9. Benson MC. Fine Needle Aspiration of the prostate. *NCI Monogr.* 1988; (7): 19-24.