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A COMPARATIVE STUDY OF FINE NEEDLE ASPIRATION CYTOLOGY VERUS TRU-CUT BIOPSY IN A PALPABLE BREAST LUMPS

Surgery

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ABSTRACT

Aims: To evaluate the comparison between accuracy of FNAC and tru cut biopsy with histopathology in palpable breast lumps. *in NIMS medical college and hospital,jaipur ,rajasthan*

Materials &Methods*:* This study includes fifty cases of breast lump. The detailed history of the patient i.e. age, sex, site and duration of involvement and other findings were recorded. In these cases, relevant clinical examination, routine laboratory investigations (TLC, DLC, ESR, peripheral blood smear examination) and radiological examinations were done.

Results: *TCNB gave correct diagnosis in 100%.while FNAC gave the correct diagnosis in 94.73 %*

Conclusion: *This study showed almost equal detection rates by TCNB (100%) and FNAC (94.73%) when comparing with histopathological examination . This study concludes if FNAC gives diagnosis one can go and proceed with surgery. But, if FNAC is negative then plan for TCNB.*

KEYWORDS

I. Introduction

Lumps of the breast have shown to be the commonest presentations in outpatient departments. Clinical examination and confirmatory diagnosis post microscopic examination is followed in most patients. Biopsy is defined as obtaining material from a living tissue for microscopic examination.

Various methods are currently applied in daily medical practice for preoperative diagnosis these methods include:

- Fine needle aspiration cytology (FNAC).
- Trucut biopsy.
- Excisional biopsy.
- Incisional biopsy.
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- **FNAC:** Now most commonly used as first line diagnostic procedure. Fine needle aspiration cytology was described by Guthrie in 1921 and latter by Martin and Ellis in 1930[1]. They are also known as "Father of FNAC". In this technique, a thin, hollow needle is inserted into the mass to extract cells that will be examined under a microscope. FNAC is very safe, minor surgical procedures. Often, in spite of performing a major surgical (excisional or open) biopsy, needle aspiration cytology can be performed.
- **Trucut / Core needle biopsy:** First described in 1982 by Perlinggren, Sweden. Tissue core biopsy has the advantage of allowing histologic rather than cytological assessment and therefore pathologist are in a better situation to give a proper diagnosis.

This type of biopsy is performed for reasons:

1. A biopsy is performed on a lump or mass when its nature is in question.
2. For known tumors, FNAC is performed to determine the effect of treatment or to obtain tissue for special studies.
3. When repeated FNAC are inconclusive.

II. Materials &Methods

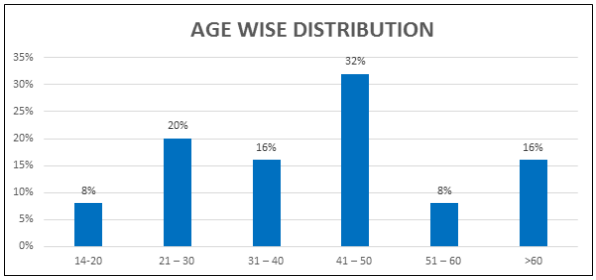
This study includes fifty cases of breast lump. The detailed history of the patient i.e. age, sex, site and duration of involvement and other findings were recorded. In these cases, relevant clinical examination, routine laboratory investigations (TLC, DLC, ESR, peripheral blood smear examination) and radiological examinations were done.

FNAC were carried out in department of surgery, later they were subjected to Trucut biopsy under local anesthesia by the surgeon. Trucut biopsy was performed with a 16-gauge needle with a length of the sample notch 1.9 cm on a spring-loaded biopsy gun. Cylindrical cut of tissue of lump was sent in 10% formalin for histopathological examination, followed by excision of the lump. The excised lump was sent for Histopathological evaluation, at the end finally the diagnosis was given by the histopathologist.

These cases were analyzed in view of age and sex with detail cytological observation, the cytological result were compared with Trucut biopsy findings and final histopathological report if the mass in excised. The percentage of accuracy, sensitivity, specificity with false negative and false positive result was analyzed.

FNAC – Materials : Equipmentsrequired to do FNAC are needle (24 G needle 20 ml disposable syringe) ,Cameco syringe pistol, gloves ,microscopic glass slide , fixative (isopropyl alcohol) ,alcohol sponges , sterile gauze pads and sterile containers.[Fig.1] **FNAC – Methods:** FNAC procedure explained cleanly to the patient and informed consent should be obtained . Prepare the area with the sterile swabs .Needle is inserted in to the lesion and aspiration done with multiple passes without taking the needle out . Then the aspirated material put in the glass slide and then smeared. Isopropyl alcohol is used as a fixative. Complications of FNAC are haematoma ,infection and dissemination of tumour.

TCNB – Materials : Disposable trucut needle 16 G or 18 G which can be used for about 5 to 6 case . In this study , 18 gauze disposable trucut needle used. For local anaesthesia , 2ml disposable syringe, gloves and 2% xylocaine solution are needed.[Fig .2] **TCNB – Methods:** The palpable lesion is fixed and skin is cleaned and then local anaesthetic is infiltrated .The needle is inserted and as soon as the lump is reached , the needle is advanced . Once the inner needle is inside the mass the outer needle is pushed and the whole trucut withdrawn. The material inside the stillet is taken and sent for HPE.



SEX WISE DISTRIBUTION

	No. of cases	Percentage (%)
Female	49	98
Male	1	2
Total	50	100

Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value and Diagnostic Accuracy of F.N.A.C. Diagnosis of Histopathologically Proven Cases

Histological diagnosis		F.N.A.C. diagnosis		True positive	True negative	False positive	False negative	Inadequate sample	Sensitivity	Specificity	PPV	NPV	Diagnostic accuracy	Inadequacy rate
Benign	Malignant	Benign	Malignant											
30	20	32	18	18	30	0	2	1	90 %	100 %	100 %	90 %	94.73%	5%

Sensitivity, Specificity, PPV (Positive Predictive Value, NPV (negative Predictive Value) and Diagnostic Accuracy of Trucut Biopsy of Histopathological Proven Cases

Histological diagnosis		Trucut diagnosis		True positive	True negative	False positive	False negative	Inadequate sample	Sensitivity	Specificity	PPV	NPV	Inadequacy rate	Diagnostic accuracy
Benign	Malignant	Benign	Malignant											
30	20	29	21	20	29	1	0	2	100 %	96.66%	100 %	95.4%	10%	100 %

Result

A total no of 50 cases were analyzed which included 1 male and 49 female subjects. The maximum number of cases were seen in 5th decade i.e. 16 cases (32%) followed by equally distributed 10 cases (20%) in 3rd followed by 8 cases (16%) in 4th & 7th decade, followed by 4 case in 6th decade.

The average of these 50 cases was 45.85 year with a range of 20 to 70 years.

On histological examination 30 case were found to be benign and 20 of them were found to be malignant.

FNAC was inconclusive in 1 case (inadequate sample) which came out to be malignant in trucut biopsy result, 20 cases were found malignant after final histopathological diagnosis, and 30 cases were found benign.

The overall sensitivity of FNAC came out to be 90% and specificity was 100%. Positive predictive value of FNAC in present study was 100%, whereas negative predictive value was 90%. Overall diagnostic accuracy of FNAC was 94.73%.

On Trucut biopsy two cases was reported as inadequate tissue (10%). 30 cases were reported benign and 20 cases found as malignant which were confirmed on histopathology.

The overall sensitivity of TRUCUT biopsy came out to be 100% and specificity was 96.66%, positive predictive value of TRUCUT was 100%, whereas negative predictive value was 95.4%, overall diagnostic accuracy was 100%.

IV. Discussion:

The present study entitled "Comparative study of F.N.A.C versus trucut biopsy in a palpable breast lumps" was carried out in Department of Surgery NIMS Medical College and Hospital.

The present study included a total of 50 cases.

Besides routine workup, all cases were subjected to fine needle aspiration cytology (F.N.A.C.), smears were prepared and stained by May Grunwald Giemsa Stain, Papanicalau and HE stain, Trucut biopsies were taken and specimens were sent to the Department of Pathology for histopathological confirmation followed by final histopathological examination, if the mass is excised.

Histopathological confirmation available in 50 cases in those lumps were excised and sent for histopathology.

All agree on the necessity for prompt diagnosis of any breast lump. Hence workers all over the world are in search of a method which can give an early as well as accurate diagnosis. The incision or excision biopsy is a well accepted diagnostic method for breast lump , but both procedures are traumatic and require operation theatre facilities. In recent years , much of emphasis is laid on FNAC. Trucut needle is a simplified needle and needle biopsy can be performed in outpatient services. FNAC is used extensively in the diagnosis of any lump. The high rate of false negative diagnosis and seedling of the cells along the needle track were the reasons that thought. Martin and ellis introduced the technique in 1934,it is not well accepted. The visit of tumour dissemination has been shown to be more in surgical biopsy as compared to FNAC.

V. Conclusion

The present study entitled **"COMPARATIVE STUDY OF FNAC VERSUS TRUCUT BIOPSY IN A PALPABLE BREAST LUMPS"** was carried out with an aim to know comparison between the specificity and sensitivity of FNAC and trucut biopsy with respect to final histopathology of the lesion. Patients who come in OPD and admit in wards were subjected to FNAC. FNAC were carried out by trained cytopathologist in department of pathology and by the surgeon, Later they were subjected to Trucut biopsy under local anaesthesia by surgeon .cylindrical cut of tissue of lump send in 10% formalin for histopathological examination, followed by excision of the lump. The excised lump was sent for Histopathological evaluation, at the end finally the diagnosis given by the histopathologist. Trucut biopsy was compared to the same patient FNAC and histopathology results.

FNAC was inconclusive in one case (inadequate sample) which comes to be malignant in trucut biopsy result, 2 cases were found malignant after final histopathological diagnosis, and 30 cases were found benign.

The overall sensitivity of FNAC comes out to be 90% and specificity was 100%. Positive predictive value of FNAC was in present study was 100%, whereas negative predictive value was 90%. Overall diagnostic accuracy of FNAC was 94.73%.

On Trucut biopsy two case was reported as inadequate tissue (10%). 2 cases were reported benign and 20 cases found as malignant which were conformed on histopathology.

The overall sensitivity of TRUCUT biopsy come out to be 100% and specificity was 96.66%.positive predictive value of TRUCUT was 100%, whereas negative predictive value was 100% overall diagnostic accuracy was 100%.

IN THE PRESENT STUDY FOLLOWING CONCLUSSION WERE DRAWN-

Advantage of FNAC compared with TRUCUT includes:

1. FNAC is very simple procedure, which can be performed in OPD patients.
2. The sampling procedure for FNAC is quicker to perform than trucut biopsy.
3. FNAC often does not require local anesthetic.
4. FNAC is less traumatic than trucut biopsy and may be more appropriate for patient taking anticoagulant medication.
5. FNAC is associated with low complication rate.
6. FNAC results are available relatively quickly (few hours).
7. Relatively inexpensive to perform.
8. There is no hesitation in repeating the FNAC on initial failure and preferably, aspiration should be done from multiple sites.

Disadvantage of FNAC compared with TRUCUT includes:

1. FNAC requires training in the preparation of quality smears.
2. Considerable cytology expertise is required to interpret FNAC
3. FNAC is generally inappropriate for the assessment of micro calcifications
4. FNAC does not enable the pathologist to distinguish between

DCIS and invasive carcinoma
5. Definitive diagnosis of some lesions can be difficult to make on the basis of FNAC. These include atypical ductal hyperplasia (ADH), low- grade DCIS, some tubular carcinomas and some invasive lobular carcinomas.
6. False negative rates are higher in FNAC compare to trucut.

Advantage of TRUCUT compared with FNAC includes:
1. TRUCUT biopsy is the investigation of choice in the evaluation of micro calcifications.
2. TRUCUT biopsy can be used when FNAC falls to correlate with clinical findings or imaging studies, as may occur with an Inadequate cytology specimen (e.g. fewer than three to six epithelial groups per slide). If the cytological findings do not correlate with the clinical and/or imaging findings, further Investigation should be performed
3. TRUCUT biopsy yields tissue fragments allowing architectural features of the lesion to be identified to determine whether CIS or invasive carcinoma is present
4. TRUCUT biopsy is useful in the evaluation of lesions likely to be low histological grade and in those presenting as architectural distortions, for which FNAC may fail or has failed to provide a diagnosis
5. TRUCUT biopsy may be preferred when appropriate cytological expertise is not available
6. Compared with FNAC TRUCUT biopsy may achieve higher specificity and sensitivity Limited data suggest. It may increase the probability of obtaining a satisfactory and representative sample, particularly for image- detected lesions.
7. Tissue is usually available for adjunctive tests.
8. TRUCUT biopsy permits preoperative knowledge of the histological type and prognostic parameters (receptor status, proliferative activity, ploidy, and expression of oncogenes and antioncogenes such as c-erbB-2 and p53), so tru-cut biopsy will guide the surgeon and the oncologist for ideal modern therapeutic strategy in surgical decision making.
9. The accuracy of Trucut biopsy for malignancy was 96.66%.
10. TRUCUT biopsy permits the eventual use of neoadjuvant therapy.

Disadvantage of TRUCUT biopsy compared to FNAC includes:
1. The reliability of core biopsy depends on the skill of the operator
2. Multiple insertions and removal of the needle.
3. Later samples composed predominantly of blood.
4. May be nondiagnostic in small lesions.
5. Cost effectiveness of automated gun instrument for procedure.
6. TRUCUT biopsy is more complex procedure compared to FNAC.
7. TRUCUT biopsy require local anesthesia.
8. Complication rate are higher in TRUCUT biopsy compared to FNAC.
9. RESULTS are available in 5-7 days.
10. Seeding of needle tract by malignant cells.

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