

Role of Fine Needle Aspiration Cytology In Radiologically Indeterminate Renal Lesions

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Date of Submission: 15-08-2019

Date of Acceptance: 30-08-2019

I. Introduction:

Fine needle aspiration cytology (FNAC) has been debated in diagnosis of adult renal tumors. However its role is accepted in radiologically indeterminate lesions.

There were four distinct indications for renal FNAB¹⁸:

- (1) solid renal masses with atypical radiological features or poorly characterized on imaging studies due to lack of intravenous contrast or body habitus.
- (2) confirmation of radiologically suspected renal cell carcinoma in inoperable patients (advanced stage disease or poor surgical candidate status).
- (3) kidney mass in a patient with a prior history of other malignancy and
- (4) miscellaneous (drainage of abscess, indeterminate cystic lesion, urothelial carcinoma) (14.0%). 36 patients (83.7%) received a specific diagnosis based on renal FNAB cytology.

II. Aims And Objectives

To assess the utility of Fine needle aspiration cytology in diagnosing radiologically indeterminate renal lesions.

III. Materials And Methods

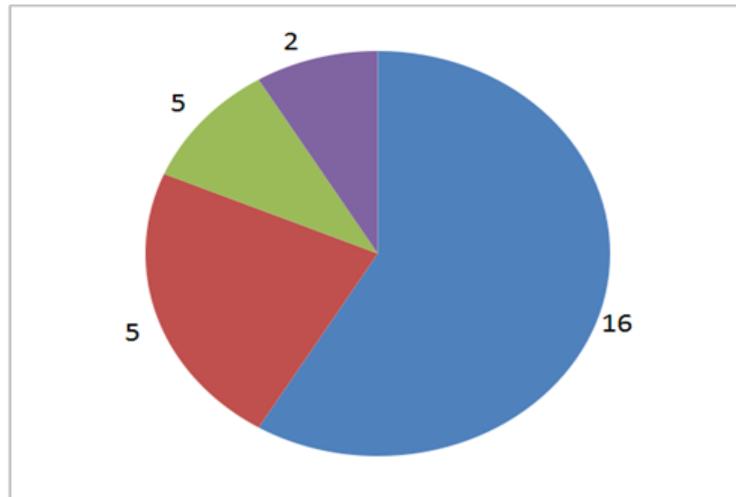
- Radiologically indeterminate renal masses under gone FNAC between January 2013 to January 2016 in Santhiram Medical college and hospital were included.
- Ultrasonography guided FNAC was performed in 26 cases and computed tomography (CT) guided aspiration in two cases
- Histological correlation was performed in all the available Nephrectomy specimens

IV. Results

During the study period, a total of 28 imageologically indeterminate renal cases were analyzed. Adult patients were 27 (age range from 40-80 years) and one male child of 3 year age. Of sixteen cases diagnosed as malignant – 11 were Renal Cell carcinoma, 1 Wilms tumor, 2 NHL, 2 were metastasis [thyroid (1) lung (1)].

Histological correlation was performed in all available nephrectomy specimens. Five cases were negative for malignancy while 2 were diagnosed as suppurative inflammation and 5 cases were inadequate. A definitive diagnosis was possible in 64% of cases.

- - malignant
- negative for malignancy
- suppurative inflammation
- inadequate



- 11 – Renal cell carcinoma
- 2 -- NHL
- 2 -- Metastasis
- 1 – Wilm’s tumor

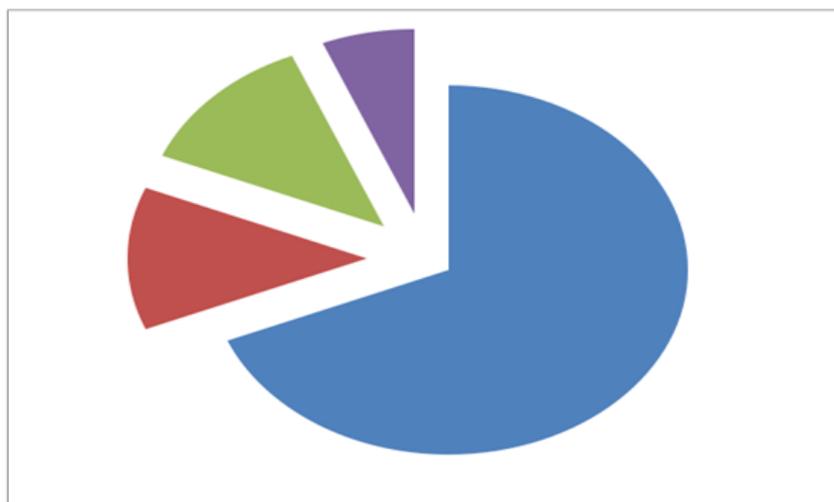


Table-1 :

Diagnosis	FNA DIAGNOSIS	HISTO DIAGNOSIS
Malignant	16	6
Negative for malignancy	5	-
Suppurative inflammation	2	-
Inadequate material	5	-
Total	28	6

Table -2 : Age wise & Sex wise Renal lesions

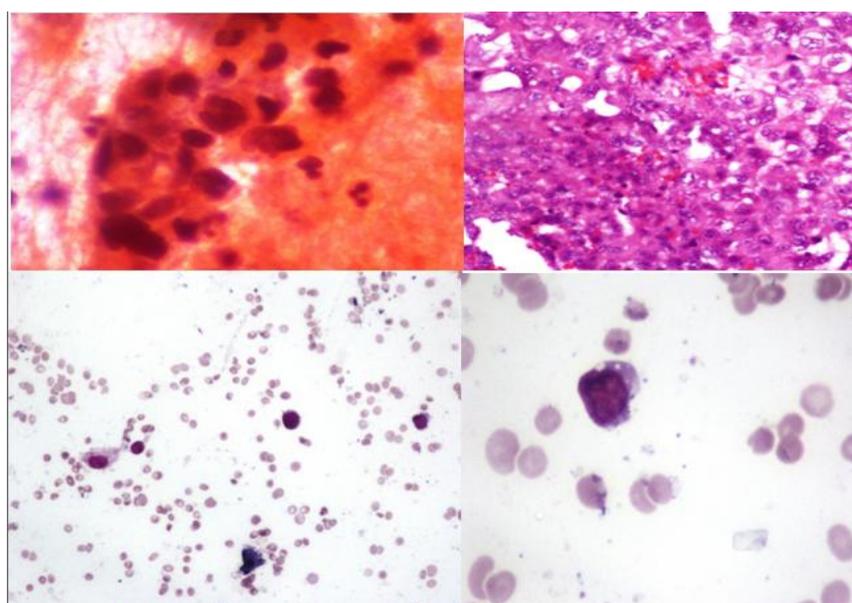
Lesions	No. of cases	0-10 yrs		10-20 yrs		20-30 yrs		30-40 yrs		40-50 Yrs		50-60 yrs		>60 yrs	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F
Wilm's Tumor	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Inflammation	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-
Benign	5	-	-	-	-	-	-	1	-	-	-	1	1	-	2
RCC	11	-	-	-	-	-	-	1	1	1	1	1	1	4	1
NHL	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Mets	2	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Total	23*	1				1		3		4		5		9	

* Total no. of cases are 28, out of which, in 5 cases, the sample was inadequate for cytological diagnosis.

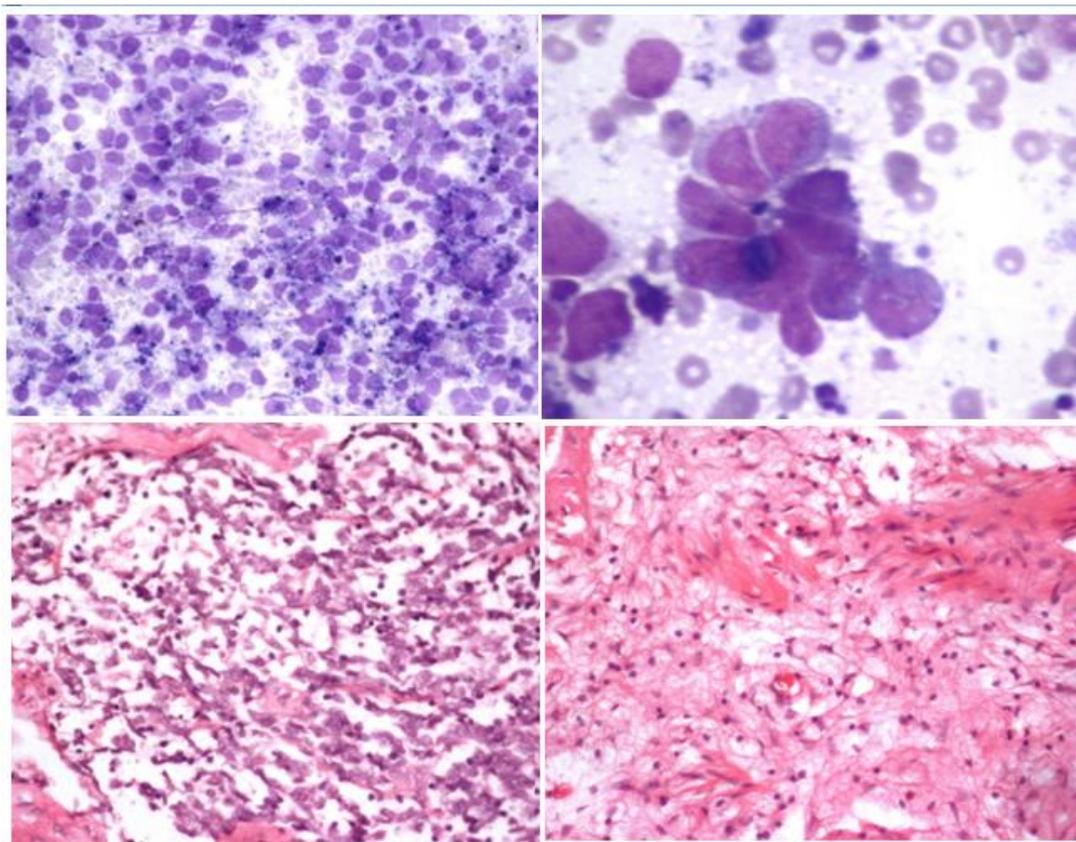
Cyto-Histologic Correlation

Table-3 :

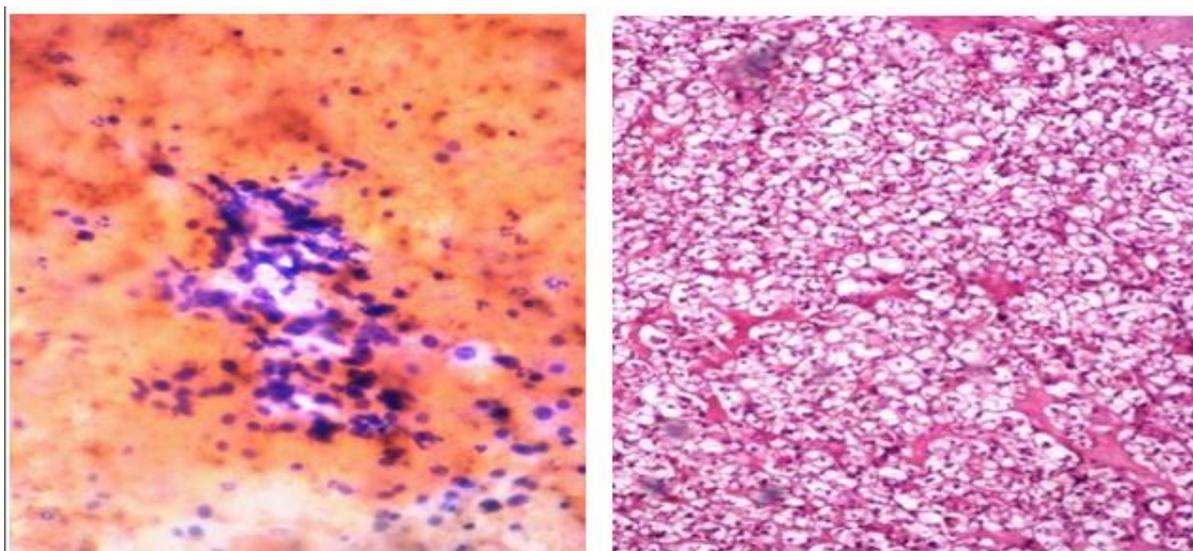
Lesion	Male	Female	Cytologic diagnosis	Histologic diagnosis	Sensitivity (%)	Specificity (%)
Renal Carcinoma Cell	1	4	5	5	100	100
Wilm's Tumor	1	0	1	1	100	100



Renal mass FNA showing few vague cluster of cells with hyperchromatic pleomorphic nucleus, with a viable tumor composed of sheets of bizarre round to polygonal cells with abundant clear to pale eosinophilic vacuolated cytoplasm.



Left renal mass showing sheets of small round cells with occasional rosettes. Sections show a lesion composed of cellular island of small round to oval in differentiated cells with scant cytoplasm, high N:C ratio, hyperchromatic nucleus and coarse chromatin: Wilms Tumor.



Cytology smears are hemorrhagic and show clusters of cells with clear cytoplasm and nuclei with anisonucleosis. Sections show a tumor composed of cells arranged in diffuse sheets with intervening fibrous septae. Cells are polygonal with abundant clear to eosinophilic cytoplasm, round to oval hyperchromatic nucleus.

V. Discussion

- There is some reluctance among clinicians and cytologists to use FNAC for the diagnosis of renal lesions .
- The present study has been undertaken to evaluate the acceptability, reliability, and accuracy of cytological diagnosis in comparison to open biopsy.

- In lesions requiring surgical removal, operative time is reduced, as frozen section biopsy may not be necessary. The aforesaid factors reduce or eliminate surgical morbidity and mortality as well as hospitalization, thereby benefiting the patient as well as the health-care system[7].
- The age of the patients ranged from 3 to 80 years, with most of the patients being in the fifth decade of life.
- Out of 28 cases, 16 were malignant. Malignant lesions were more common (16 cases, 57.14%) than benign lesions (5 cases, 17.85%).
- These results were comparable with those obtained by Miralles *et al.*,1986[4] but different from those from a study by Nagira *et al.*,2002[8]
- Out of 28 cases of the kidney which included renal cell carcinoma (12), Wilm's tumor (1), metastasis (2), NHL(2), Suppurative inflammation (2), inadequate material(5), and negative for malignancy (5). Nineteen patients (67.8%) were males and nine (32.1%) were females.
- The youngest patient with a renal mass was 3 years old and had Wilm's tumor; the oldest patient was 80 years old and had renal cell carcinoma. The age of the patients was 3-80 years, a finding which was in accordance with those of Mondal and Ghosh.,1992[9] USG-guided percutaneous FNAC of renal masses was first reported by Kristensen *et al.*,1972[10]. All the smears from renal masses were richly cellular.
- Histopathological investigation results were available in 06/16 cases. Five cases found to be renal cell carcinoma on FNAC, were actually found to be renal cell carcinomas on histological investigation.
- We aspirated two masses from the renals, one was a sarcomatoid carcinoma in a 65 year-old female and the other was a metastatic carcinoma of lung in a 51 year-old male. Histological investigation was not done in either of the cases.
- The results indicate that renal masses FNA has a good sensitivity rate. A major limitation of FNA is the failure to obtain diagnostic material.
- The mean rate of insufficient samples for FNA in the present patients was 16%, similar to that in other reported series. The sensitivity of FNA for the diagnosis of carcinoma in other studies was 75±85%.
- Recently Wood et al reported a positive predictive value of 100%, but an 83% negative predictive value for FNA performed on a highly selected group of 74 renal masses with a size range of 1±20 cm.
- Percutaneous core biopsy using large-bore needles has not been found to improve the sensitivity of diagnosis over FNA.However, Wood et al suggested that core biopsy and FNA are complementary and the combination of these techniques was better than either alone.
- The goal in the diagnostic work-up of renal masses is to differentiate benign from malignant tumors, and furthermore to better categorize RCCs to enable treatment to be tailored to the patient.
- This goal is the result of the changing landscape of renal tumors and the treatment modalities currently available [1,2,4,5]
- Fine needle aspiration cytology is useful in establishing diagnosis of indeterminate renal masses and it guides further management.

VI. Conclusion

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References

- [1]. Porter B, Karp W, Forsberg L. Percutaneous cytodiagnosis of retroperitoneal masses by USG guided FNAB. Acta Radiol. 1981;22:663–8.
- [2]. Mankin HJ, Lange TA, Spanier SS. The hazards of biopsy in patients with malignant primary bone and soft-tissue tumours. J Bone Joint Surg Am. 1982;64:1121–7.
- [3]. Kedar RP, Patel VH, Merchant SA, Aggarwal V, Pandit AA. Ultrasound guided aspiration cytology—a valuable diagnostic aid. J Postgrad Med. 1991;37:84–7.
- [4]. Miralles TG, Gosalbez F, Menéndez P, Astudillo A, Torre C, Buesa J. Fine needle aspiration cytology of soft-tissue lesions. Acta Cytol. 1986;30:671–8.
- [5]. Nagira K, Yamamoto T, Akisue T, Marui T, Hitora T, Nakatani T, et al. Reliability of fine-needle aspiration biopsy in the initial diagnosis of soft-tissue lesions. Diagn Cytopathol. 2002;27:354–61.
- [6]. Cotran RS, Kumar V, Robins SL. Vol. 12. Pennsylvania: WB, Saunders; 1974. Pathology basis of diseases; pp. 260–327.
- [7]. Rubin E. 2nd edition. Philadelphia; JB. Lippincott: 1994. Pathology; pp. 1275–316.
- [8]. Rekhi B, Gorad BD, Kakade AC, Chinoy R. Scope of FNAC in the diagnosis of soft tissue tumours-A study from a tertiary cancer referral center in India. Cytojournal. 2007;4:20. [
- [9]. Mondal A, Ghosh E. FNAC in the diagnosis of solid renal masses - A study of 92 cases. Indian J Pathol Microbiol. 1992;35:333–9.
- [10]. Kristensen JK, Bartels E, Jorgensen HE. Percutaneous renal biopsy under the guidance of ultrasound. Scand J Urol Nephrol. 1972;8:223–6.

- [11]. Dey P, Radhika S, Rajwanshi A, Rao KL, Khajuria A, Nijhawan R, et al. Aspiration cytology of Wilm's tumour. *Acta Cytol.* 1993;37:477–82. [
- [12]. Renshaw AA, Granter SR, Cibas ES. Fine-needle aspiration of the adult kidney. *Cancer.* 1997;81:71–88.
- [13]. Gupta RK, Nowitz M, Wakefield SJ. Fine-needle aspiration cytology of renal angiomyolipoma: Report of a case with immunocytochemical and electron microscopic findings. *Diagn Cytopathol.* 1998;18:297–300.
- [14]. Handa U, Nanda A, Mohan H. Fine-needle aspiration of renal angiomyolipoma: A report of four cases. *Cytopathol.* 2006;18:250–4.
- [15]. Pilotti S, Rilke F, Alasio L, Garbagnati F. The role of fine needle aspiration in the assessment of renal masses. *Acta Cytol.* 1988;32:1–10.
- [16]. Bezabih M. Cytological diagnosis of soft tissue tumours. *Cytopathol.* 2000;12:177–83.
- [17]. Nahar Saikia U, Khirdwadkar N, Saikia B, Sood B, Goldsmith R, Dey P, et al. K. Image-guided fine-needle aspiration cytology of deep-seated enlarged lymph nodes. *Acta Radiol.* 2003;43:230–4.
- [18]. Jhala NC, Jhala D, Eloubeidi MA, Chhieng DC, Crowe DR, Roberson J, Eltoum I. Endoscopic ultrasound-guided fine-needle aspiration biopsy of the adrenal glands. Presented in part at the 51st Annual Scientific Meeting of the American Society of Cytopathology, Orlando, Florida. 2003
- [19]. Ema A, Dragoescu, Lina Liu. Indications for renal fine needle aspiration biopsy in the era of modern imaging modalities. *Cytojournal.* 2013; 10: 15.

Hasham Shaik. "Role of Fine Needle Aspiration Cytology Radiologically Indeterminate Renal Lesions." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 8, 2019, pp 48-53.