Research Article

CT Guided FNAC of lung mass – A retrospective study of Disease Spectrum

Singh R[1], Mallik M[2], Rai H. K[3], Singh S[4], Mallick S[5], Manish Kumar[6]

[1]Dr. Rashmi Singh, Assistant Professor, Pathology, Patna Medical College, [2]Dr. Mahasweta Mallik, Assistant Professor, Pathology, Patna Medical College, [3]Dr. Hari Kishore Rai, Consultant Radiologist, Max Life, Patna, [4]Dr. Shweta Singh Tutor, Microbiology, AIIMS, Patna, [5]Dr. Sujata Mallick, Assistant Professor, Pathology, KPC Medical College, Jadavpur, [6]Dr. Manish Kumar, Assistant Professor, Pathology, Patna Medical College, Bihar, India

Address for correspondence: Dr. Mahasweta Mallik, Email: coolsama6773@yahoo.co.in

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Abstract

CT guided FNAC is a well established method in the cytological diagnosis of pulmonary lesion. **Aim:** Aim of our study is to evaluate the pathological spectrum of disease in lump through CT guided FNAC. **Material & method:** 69 causes were evaluated **retrospectively** for a period of 4 yrs. **Result:** out of 69 cases 52.1% were male. Mean age was 54. 34 years. 65.2% having malignant lesion & 34.7% have benign. Adeno CA was the predominant malignant tumour. **Conclusion:** CT guided FNAC can diagnose pulmonary lesion fairly accurately leading to less morbidity & mortality as treatment can be started early.

Key words: Computed tomography, Fine needle aspiration cytology, Lung mass

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Introduction

Computed tomography guided fine needle aspiration cytology is a well established method in the cytological diagnosis of pulmonary nodules, FNAC distinguishes between benign & malignant lesion & also helps in typing of cancer so specific therapy such as chemotherapy or surgery can be started without delay, FNAC was first used by martin & ellis [1] as a diagnostic tool. In 1976 Haaga & Alfidi reported CT guided biopsy & since then this procedure has be shown to be both effective & accurate. The diagnostic accuracy is reported to be more than 80% in benign disease & more than 90% in malignant disease [2] pneumothorax is the most common complication. Authors have reported 22-45 % risk of pneumo-thorax in CT guided FNAC, The purpose of this study is to evaluate the pathological spectrum of disease in lungs through CT guided FNAC [3].

Material & Method

The study was carried out in a tertiary care teaching institute in patna & a nearby diagnostic centre. A total of 69 cases were studied for a period of 4 yrs from Jan 2011 to Dec 2014. Exclusion criteria were COPD, bleeding disorder, pulmonary arterial HTN & unco-operative patient.

Selection criteria were: Co-operative patient who were able to hold breath. CT guided FNAC was performed by pathologist in co-oradination with radiologist as OPD procedure, to each patient risk & benefit were explained & informed consent taken. Skin was cleaned by betadine & 21G - 88mm long spinal needle was introduced through percutaneous transthoracic approach. The exact position of lesion was established by CT scan & the measurement of site, angle, depth, route of needle was determined. After the needle placement & CT scan done to ascertain that the tip of the needle was within the mass.

The aspirate was obtained by to & fro movement of needle within the mass. Air dried smears were stained with MGG stain, Alcohol fixed smear were pap stained & the evaluation was done. Patients were kept for 2 hrs under observation. In our study 2 cases developed pneumo-thorax who were managed conservatively. 3 had chest pain & had mild haemorrhage from the lesion area. All were managed conservatively.

Manuscript received 25th April 2016
Reviewed: 11th May 2016
Author Corrected: 24th May 2016
Accepted for Publication 5th June 2016

Result

Out of 69 cases 36 were male & 33 female.
Age group was from 27 to 84 years with mean age of 54.34yrs.

Table 1: Showing spectrum of lesion

Disease	No of cases	%
Sq cell CA	17	24.6
Adeno CA	23	33.33
Small cell CA	2	2.89
Poorly diff CA	3	4.34
Pyogenic Abscess	5	7.24
Ch. Non Sp.Infl.	13	18.84
TB	4	5.7
Benign Cystic	1	1.44
Keratinising Cyst	1	1.44

24 cases were of benign lesion. Among the benign lesion ch. non sp in flammation was the most common, accounting for 13 cases followed by pyogenic abscess which were 5cases, tuberculosis 4 cases & Benign cystic disease & keratinising cyst 1case each.

45 cases were malignant with adeno CA exceeding sq cell CA, 23 & 17 respectively. Poorly differentiated CA was 3 and small cell CA 2 cases.

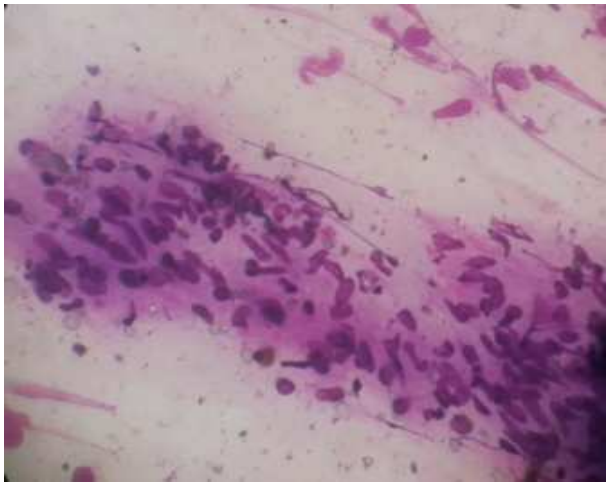

Fig 1: showing tuberculous granuloma in lung. (MGG stains 400X).

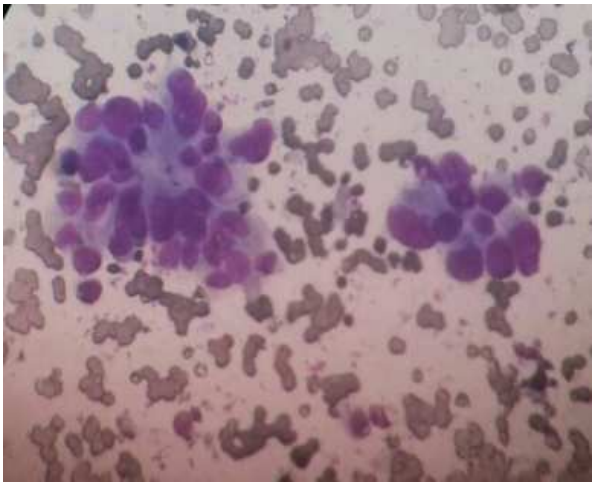

Fig 2: showing adenocarcinoma of lung. (MGG stains 400X).

Discussion

CT guided transthoracic needle aspiration cytology is safe & accurate method for diagnosis & categorization of malignant & benign lesion. Accuracy of procedure varies in range from 64% to 97% [3]. Our present study 69 cases were studied over a period of 4 yrs. Conclusive cytodiagnosis diagnosis were made in all the 69 cases. Most Patients tolerated the procedure well. Most common complaint was pain at the procedure site which subsided without medicine in 4-6 hrs. 2 cases had pneumothorax which was mild & resolved conservatively. No chest tube insertion was necessary. 2 cases had mild hemorrhage where no treatment was required.

All the cases were adult. The mean age was 54.34 yrs similar to other studies. Mondal et al has a mean age of 56.6 yrs [4], Singh et all [5] 56.4 yrs was the average age and Saha et al 56.8 yrs [6].

There was a male preponderance [52.1%]. Percentage of male in other studies were Tan et al 71.1% [7], Saha A et al [6] 78.9% , Bandyopadhyay et al 80.6% [8] & Mondal et at 64.51% [4]. Out of the 69 cases 24 (34.7%) were benign & 45 (65.2%) were malignant. Mondal et al had benign lesion 8.07% and malignant lesion 91.93%.[4]. Tan et al had 65.8% malignant, 1.8% atypical and 25.4% benign and 7% inadequate [7].

The incidence of Adenocarcinoma was higher than squamous cell carcinoma in our study similar to study by Mondal et at [4], Tan et al [7] & Madan et al [9]. Mondal et al had adenocarcinoma in 51.72% followed by squamous cell carcinoma 22.41 %.[4]. Other National & international studies showed squamous cell CA to be more than adenocarcinoma [8,10, 11,12].

Table comparing result of CT guided FNAC with other studies.

studies	No. of Cases	Pneumothorax Complication	Hemorrhage	Haemoptysis
Stanley et al (1987) [13]	458	133 (29%)	-	5 (1.1%)
Vansonmen berge et al (1988) [14]	150	64 (42.7%)	2	5(3.3%)
Haramati et al (1995) [15]	32	3(9.4 %)	-	-
Santambrogio et al (1997) [16]	110	23(20.9%)	-	-
Gouliamos et al (2000) [17]	110	2(3. 1 %)	1	-
Mohammad et al (2001) [4]	184	2 (1.1 %)	-	10(5.4%)
Gupta et al (2002) [18]	37	1(2.7 %)	1	-
Singh et al (2004) [5]	34	4 (11.8%)	4	1 (2.9 %)
Mondal et al (2013) [4]	130		1	-
Present (2016)	69	2 (2.8%)	2	-

A study by Kalhan S et al showed sensitivity and specificity of CT guided FNAC to be 93.2% and 100% respectively. (20). USG guided FNAC sensitivity and specificity was 91.3% and 100 % respectively. (20). Both seems to be good method for diagnosis of lung lesion.

Conclusion

We conclude then due to the high sensitivity & specificity CT guided FNAC of lung mass gives early diagnosis & improve treatment modality reducing morbidity & mortality due to disease. Complication due to this procedure is not high & can be managed conservatively.

Funding: Nil, **Conflict of interest:** None initiated.
Permission from IRB: Yes

References

1. Martin HE, Ellis EB. BIOPSY BY NEEDLE PUNCTURE AND ASPIRATION. Ann Surg. 1930 Aug;92(2):169-81.

2. Geraghty PR, Kee ST, Mc Farlane G, Razavi MK, Sze DY, Dake MD. CT-guided transthoracic needle aspiration biopsy of pulmonary nodules: needle size and pneumothorax rate.Radiology.2003 Nov;229(2):475-81.

3. Herman PG, Hessel SJ. The diagnostic accuracy and complications of closed lung biopsies. Radiology. 1977 Oct;125(1):11-4.

4. Mohammad GM. CT guided fine needle aspiration cytology in the diagnosis of thoracic lesions. JIMA 2001:99(10):1-5.

5. Mondal SK, Nag D, Das R, Mandal PK, Biswas PK, Osta M. Computed tomogram guided fine-needle aspiration cytology of lung mass with histological

correlation : A study in Eastern India. South Asian J Cancer. 2013 Jan;2(1):14-8. doi: 10.4103/2278-330X. 105881.

6. Singh JP, Garg L, Setia V, Computed tomography guided fine needle aspiration cytology in difficult thoracic mass lesions-not approchable by USG. Indian J radiology. Imaging 2004 May:14:395-400.

7. Saha A, Kumar K, Choudhuri MK. Computed tomography-guided fine needle aspiration cytology of thoracic mass lesions: A study of 57 cases. J Cytol. 2009 Apr;26(2):55-9. doi: 10.4103/0970-9371.55222.

8. Tan KB, Thamboo TP, Wang SC, Nilsson B, Rajwanshi A, Salto-Tellez M. Audit of transthoracic fine needle aspiration of the lung : cytological subclassification of bronchogenic carcinomas and diagnosis of tuberculosis. Singapore Med J. 2002 Nov; 43(11):570-5.

9. Bandyo padhyay A, Laha R, Das TK et al. CT guided fine needle aspiration cytology of thoracic mass lesions: A prospective study of immediate cytological evaluation : Indian J pathological Microbiology. 2007 Jan; 50(1) : 51-5

10. Madan M. Bannur Evaluation of FNAC in lung disease. Turk J pathology. 2010 Nov; 26(1): 1-6.

11. Shah S, Shukla K, Patel P. Role of fine needle aspiration cytology in diagnosis of lung tumours-a study of 100 cases. Indian J Pathol Microbiol. 2007 Jan; 50(1):56-8.

12. Jaya SE, Pavani B, Chandra E et al. Computed tomography guided percutaneous thoracic: Fine needle aspiration cytology in lung & mediastinum. J Cytol Histol. 2010; 107:1-3 doi:4172/2157-7099.1000107.

13. Basnet SB, Thapa GB, Shahi R, Shrestha M, Panth R. Computed tomography guided percutaneous transthoracic fine needle aspiration cytology in chest masses. JNMA J Nepal Med Assoc. 2008 Jul-Sep; 47(171):123-7.

14. Stanley JH, Fish GD, Andriole JG, Gobien RP, Betsill WL, Laden SA, Schabel SI. Lung lesions: cytologic diagnosis by fine-needle biopsy. Radiology. 1987 Feb;162(2):389-91.

15. vanSonnenberg E, Casola G, Ho M, Neff CC, Varney RR, Wittich GR, Christensen R, Friedman PJ. Difficult thoracic lesions: CT-guided biopsy experience in 150 cases. Radiology. 1988 May;167(2):457-61.

16. Haramati LB. CT-guided automated needle biopsy of the chest. AJR Am J Roentgenol. 1995 Jul; 165 (1):53-5.

17. Santambrogio L, Nosotti M , Bellauiti N et al. CT guided FNAC of solitary pulmonary nodules: a prospective randomised study of immediate cytologic evaluation. Chest 1997 Aug; 112:423-5 doi:10. 1378 / chest.112.2.423.

18. Gouliamos AD, Giannopoulos DH, Panagi GM, Fletoridis NK, Deligeorgi-Politi HA, Vlahos LJ. Computed tomography-guided fine needle aspiration of peripheral lung opacities. An initial diagnostic procedure? Acta Cytol. 2000 May-Jun;44(3):344-8.

19. Gupta S, Wallace MJ, Morello FA Jr, Ahrar K, Hicks ME. CT-guided percutaneous needle biopsy of intrathoracic lesions by using the transsternal approach: experience in 37 patients. Radiology. 2002 Jan; 222 (1) : 57-62.

20.Kalhan S, Sharma P, Sharma S, Dudani S, Ramakrishnan Ts, Chowdhry A. Evaluation of precision of guidance techniques in image guided fine needle aspiration cytology of thoracic mass lesions. J Cytol. 2012 Jan;29(1):6-10. doi: 10.4103/0970-9371.93209.

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How to cite this article?

Singh R, Mallik M, Rai H. K, Singh S, Mallick S, Manish Kumar. CT Guided FNAC of lung mass – A retrospective study of Disease Spectrum. *Int J Med Res Rev* 2016;4 (7):1088-1091.doi: 10.17511/ijmrr.2016.i07.02.

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