

Follow-up of CT-guided Lung Biopsy Complications Rates & Insufficient Cells for Pathology After Introduction of 1 cm Lesion Size Cut-off and Implementation of Both Mandatory Core Biopsies and FNA

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CONFLICT OF INTEREST

- **Andrew Ho** has no disclosure.
- **Ravi Gullipalli** has no disclosure.

OBJECTIVES

- Background & Triggers
- Methodology
- Results/Data
- Discussion
- Action Plan
- Summary

BACKGROUND & TRIGGER

- Problem: High rate of ‘insufficient cells or non-diagnostic sample’ on our pathology reports in 2011
- Performed CT lung biopsy audit in 2011
- Results: ‘insufficient sample’ was more than 3X the acceptable limit.

BACKGROUND & TRIGGER

- Discussion with thoracic surgeons and pathologists
- **Recommendations:**
 - **minimum 2 core biopsies** if patient can tolerate it & FNA
 - CT f/u <1 cm lesions instead of biopsy

METHODOLOGY

- CT-guided lung biopsies at St. Clare's Mercy
- 6 months of data (July – December 2013)
- Data collected:
 - Size of lesion
 - Radiologist/resident
 - # of passes (core & FNA)
 - Complications
 - Review pathology reports

STANDARDS

Diagnostic Adequacy	
Insufficient sampling	< 10%
Complications	
Pneumothorax (simple)	< 20%
Pneumothorax (complicated)	< 5%
Pulmonary hemorrhage	< 5%
Hemoptysis	< 5%
Death	< 0.15%

Manhire A, Charig M, Clelland C et al. Guidelines for Radiologically Guided Lung Biopsy. British Thoracic Society Guidelines. Thorax 2003; 58: 920 – 936.

RESULTS/DATA (1/2)

YEAR	2011	2013
CT LUNG BIOPSY #	79	66

SIMPLE PTX	2011	2013
Std: < 20%	18% (14)	24% (16) ↑

COMPLICATED PTX	2011	2013
Std: < 5%	4% (3)	6% (4) ↑

HEMORRHAGE	2011	2013
Std: <5%	5% (4)	8% (5) ↑

HEMOPTYSIS	2011	2013
Std: < 5%	1% (1)	2% (1) ✓

RESULTS/DATA (2/2)

INSUFFICIENT SAMPLES	2011	2013
Std: < 10%	32% (25)	3% (2) ↓

MALIGNANCY	2011	2013
	42% (32)	80% (53) ↑

DISCUSSION

- Insufficient samples – size did not matter, range 2.5 – 5.6 cm, none performed by residents
- “Core needle biopsy is superior to FNA.”
 - Core biopsy has a high diagnostic accuracy rate with reasonable complication rates.
 - Core evaluates tissue patterns & ancillary diagnostic tests. Molecular fingerprints or biomarker testing in the future.
 - FNA has higher false positive rate due to technical issues.

ACR APPROPRIATENESS CRITERIA[®] RADIOLOGIC MANAGEMENT OF THORACIC NODULES

- preselecting patients with nodules having high potential for malignancy;
- providing onsite analysis of the specimen, rather than placing the specimen in fixative for later analysis, thus allowing higher diagnostic accuracy;
- performing both fine-needle aspiration (FNA) and core biopsies of the same lesion, which has been shown to increase yield over FNA alone;
- using a steeper angle of the biopsy needle, which may decrease the risk for pneumothorax; and
- using a 19-gauge or smaller needle.

ACTION PLAN

- Re-audit in 2 years.
- Implement the same recommendations and perform the same audit at St. John's other major tertiary centre (Health Sciences Centre).

SUMMARY

- After consultations with the thoracic surgeons and pathologists, we implemented:
 - Minimum 1 cm size cut-off for CT lung biopsies
 - Mandatory core biopsies and FNA
- we successfully:
- ✓ Reduced insufficient biopsy samples
 - ✓ Increased our malignancy yield rates
 - ✓ Without increasing our complications rates

REFERENCES

- Manhire A, Charig M, Clelland C et al. Guidelines for Radiologically Guided Lung Biopsy. British Thoracic Society Guidelines. Thorax 2003; 58: 920 – 936.
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- Ray CE, English B, Funaki BS et-al. ACR appropriateness criteria[®] radiologic management of thoracic nodules and masses. J Am Coll Radiol. 2012;9 (1): 13-9.

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