CHEST 2023
HONOLULU | OCTOBER 8-11

# Procedures

**SESSION TITLE:** Proceduralist Round Table
**SESSION TYPE:** Rapid Fire Original Inv
**PRESENTED ON:** 10/10/2023 12:00 pm - 12:45 pm

## RADIATION EXPOSURE TRENDS WITH AUGMENTED FLUOROSCOPY AND C-ARM-BASED TOMOSYNTHESIS FOR NAVIGATED BRONCHOSCOPY

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**PURPOSE:** To examine trend of radiation doses to patient over a study time period as mean dose area product in Gy cm2 with augmented fluoroscopy (AF) and C- arm based tomography (CABT) for guided bronchoscopy procedures.

**METHODS:** We prospectively examined 46 cases done at our institution over a period of two years. All patients underwent guided bronchoscopic biopsies with AF and CABT under general anesthesia for pulmonary nodules. Fiberoptic bronchoscopy for lung nodule biopsies were done under AF guidance with standard GE C-arm 9900 and Body Vision's CABT navigation system. C arm spins to locate lesion were done during procedure. Effective radiation doses in millisievert (mSv), mean dose area product in Gy cm2 and fluoroscopic time in minutes utilized were examined in three distinct study periods of 5 month each. All patients were followed for over period of one year.

Statistical analysis using SPSS was conducted to calculate means for categorical variables. Fisher exact tests and multiple logistic regressions were used to examine lesion characteristics and radiation doses affecting diagnostic yield for p value $< 0.05$ significance.

**RESULTS:** Mean size of lesions was 2.1cm, and median 2 cm. Diagnostic accuracy with CABT was 83% for all lesions. Overall sensitivity was 80%, specificity 100%, positive predictive value (PPV) 100%, and negative predictive value (NPV) 42%.

For malignant lesions: Sensitivity was 75%, Specificity 100%, PPV 100% and NPV 64%. Non diagnostic sampling was seen in 17% (8/46 samples). 3 patients developed a pneumothorax with two requiring chest tube.

The diagnostic yield for lesions size $<$ 1cm was 100% since the lesions were all benign etiology on follow up after biopsies for over a year. Diagnostic yield for lesions size 1-2cm was 77%, for lesions $>$ 2cm-3cm it was 75% and for lesions $>$ 3cm it was 100%. Localization of the lesions was done at least two different planes before biopsy for 85% (39/46), improving diagnostic yield (p value 0.03). C arm spins and tool re adjustments were done for tool in the lesion views in 83% (38/46)

Mean and median effective radiation dose to patient during CABT procedures were 3 mSv. Mean dose area product was 38 Gy cm2. Mean fluoroscopy time utilized was 7 minutes and median time 5 minutes. A mean of 1.6 C arm spins, and a median of 1 spin at the lesion were done for the procedures.

Radiation trends with experience over a span of 15 months in separate periods of 5 months each were studied. Between the periods mean fluoroscopy time and number of C spins done for the lesions did not vary much. A decrease in the mean effective radiation dose from 7mSv in the first 5 months to 4mSv during the last five-month period of the study was noted.

**CONCLUSIONS:** Acceptable and improved diagnostic yields can be obtained from AF and CABT. Use of pulse dose fluoroscopy time and operator diligence helps decreases radiation doses without compromising accuracy.

**CLINICAL IMPLICATIONS:** AF and CABT use for navigated bronchoscopy procedures of lung nodules has low effective radiation doses to the patient.

**DISCLOSURES:**

No relevant relationships by Roshen Mathew

No relevant relationships by Winnie Roy

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