



DIAGNOSTIC YIELD AND SAFETY OF BRONCHOSCOPIC LUNG CRYOBIOPSY IN EVALUATION OF PULMONARY LESIONS

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BACKGROUND

Endobronchial and peripheral lung lesions are commonly identified on chest radiography or CT and they are usually considered neoplasms until proven otherwise. Bronchoscopic lung cryobiopsy (BLCB) is a new interventional technique that can be used to obtain either transbronchial or endobronchial samples for histological diagnosis by large samples of lung tissue with minimal artifacts.

OBJECTIVES

To study the diagnostic yield of BLCB in both lung lesions (central and peripheral), to establish a relationship between demographic data and risk factors of the studied patients and the histological variant of the identified neoplasm.

METHODS

This is a retrospective study of patients with CT-diagnosed pulmonary lesions (central and peripheral) who underwent BLCB during the period January 2021-January 2022. The procedure was performed under general anaesthesia and bronchoscopy was introduced through a laryngeal mask. BLCB using 2.4 and 1.7 mm cryoprobe was taken. Diagnostic yield of BLCB was analysed as a positive tissue diagnosis after histological and immunohistochemical examination along with the compilations rate of the procedure.

RESULTS

Neoplasms were identified in 94.6% of 373 biopsies, performed on 131 patients. In the patients with proven neoplasms and those without evidence, the mean number of biopsies was significantly different (median 2 with IQR 1-2 and 3 with IQR 2-4, respectively), $p = 0.002$. 95.7% of patients with centrally located lesions ($n=116$), accounting for 94.7% of performed biopsies, showed neoplasms. Neoplasms were found in 60% of patients with peripheral lesions ($n=15$), however, due to a small n value, the results should be interpreted with caution. The total number of biopsies was 33, and 22 had a neoplasm (66.7%).

TABLE 1.
Patient characteristics

Categories	Values	
	central	peripheral
Sex; male	116; 82	15; 9
Age, years, median (range)	62.8 (26-86)	68.1 (49-88)
With smoking history (%)	89 (76,7)	12 (85,7)
Professional risk factors (%)	6 (5,2)	3 (21,4)
Comorbidities		
COPD (%)	30 (25,9)	5 (33,3)
Arterial hypertension (%)	52 (44,8)	6 (40,0)
Ischemic heart disease (%)	16 (13,8)	3 (20,0)
Heart failure (%)	4 (3,4)	0
Diabetes mellitus (%)	8 (6,9)	2 (13,3)
Cerebrovascular disease (%)	1 (0,9)	0
Deep vein thrombosis (%)	1 (0,9)	0
Peripheral artery disease (%)	2 (1,7)	2 (13,3)
Neoplasms (%)	17 (14,7)	4 (26,7)

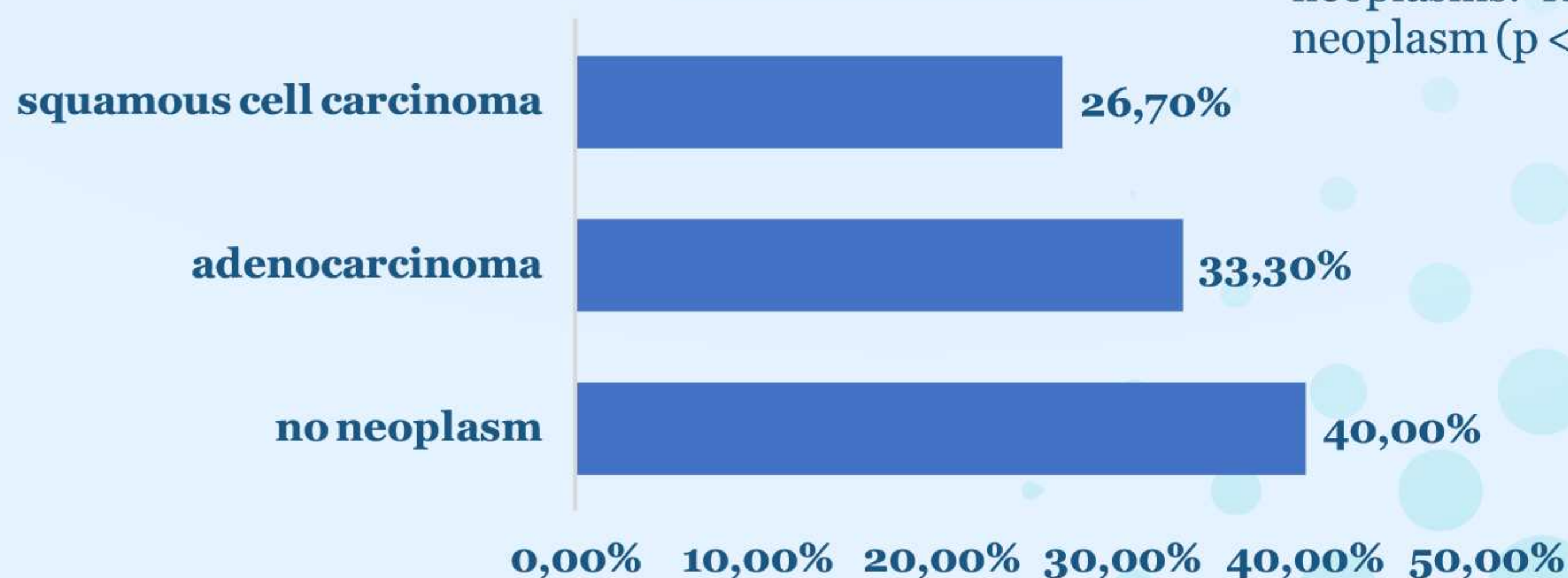
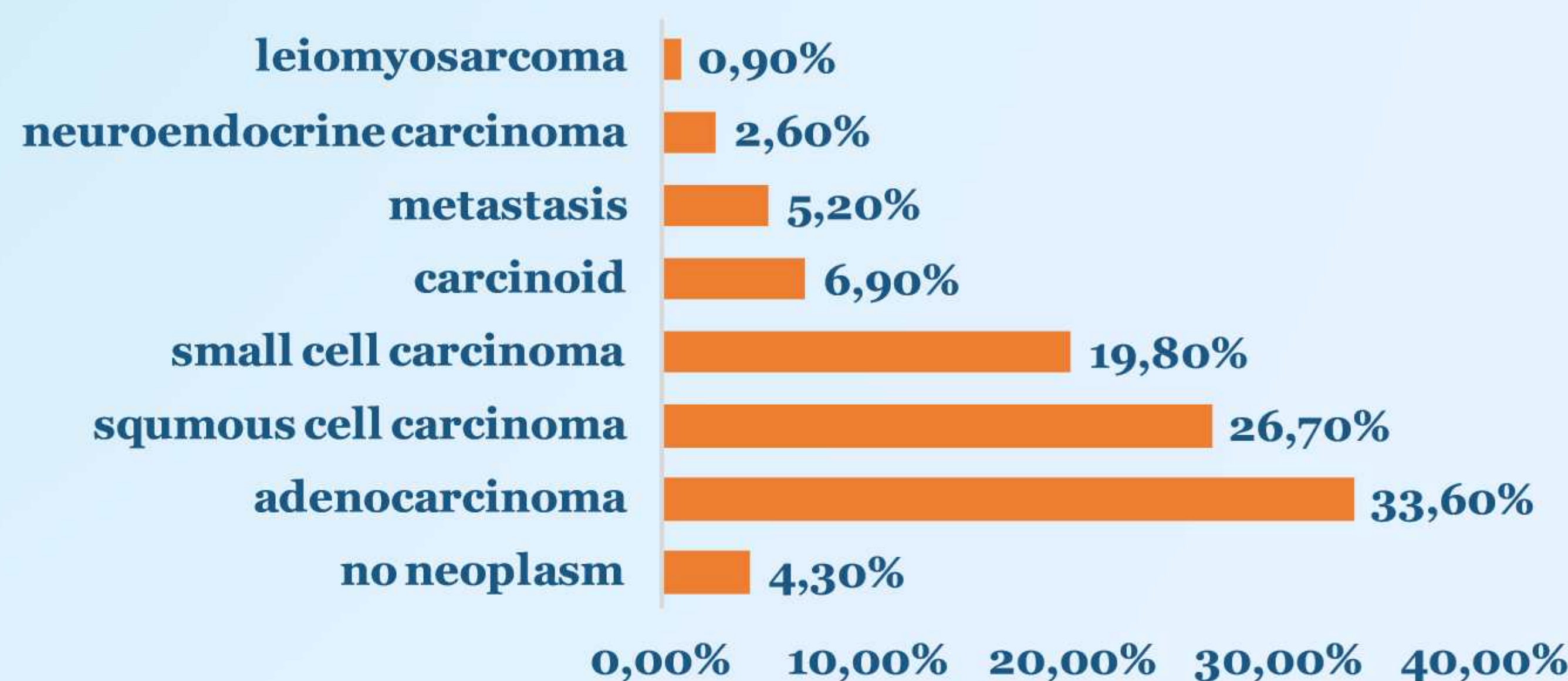


FIGURE 2.
Histological and immunohistochemical diagnosis of peripheral lesions after biopsy

FIGURE 1.
Histological and immunohistochemical diagnosis of central lesions after biopsy



A relationship between lesions location and histological outcome was identified ($p < 0.001$). In patients with adenocarcinoma, the number of comorbidities was significantly lower ($p = 0.009$). Squamous cell carcinoma was more common in patients with concomitant diseases ($p < 0.0001$), patients with COPD ($p = 0.024$), AH ($p = 0.05$), DM ($p = 0.008$). The age of patients with squamous cell carcinoma was significantly higher than that of patients with other established neoplasms ($p = 0.005$), and the number of concomitant diseases was significantly greater ($p = 0.001$). Carcinoid was substantially more common in patients who did not smoke ($p = 0.012$) and had no risk factors ($p = 0.010$). The mean age of carcinoid patients was significantly lower ($p = 0.003$) and the number of risk factors ($p = 0.004$) compared to patients with other neoplasms. As expected, metastasis was found considerably more frequently among patients with any neoplasm ($p < 0.001$).

Mild bleeding occurred in 29% of patients after BLC; no pneumothorax was found. Mild to moderate bleeding after biopsy was observed more commonly in patients with metastases ($p = 0.059$).

FIGURE 3.
Complications rate in central lesions

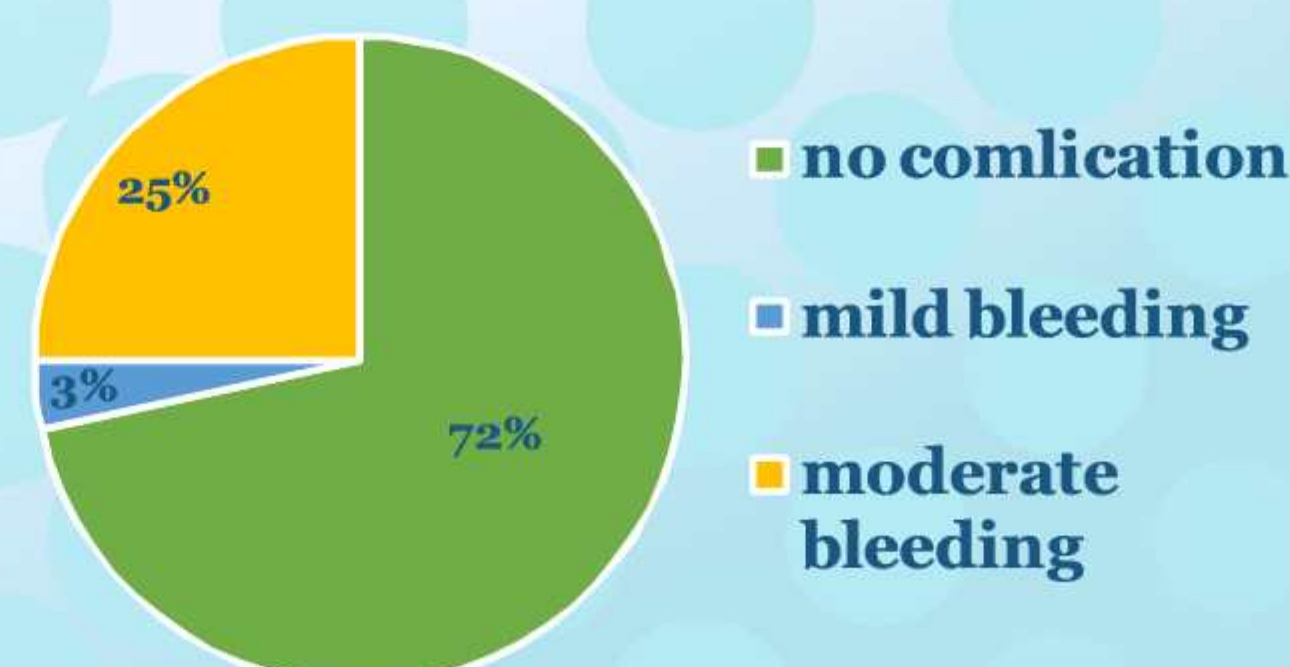
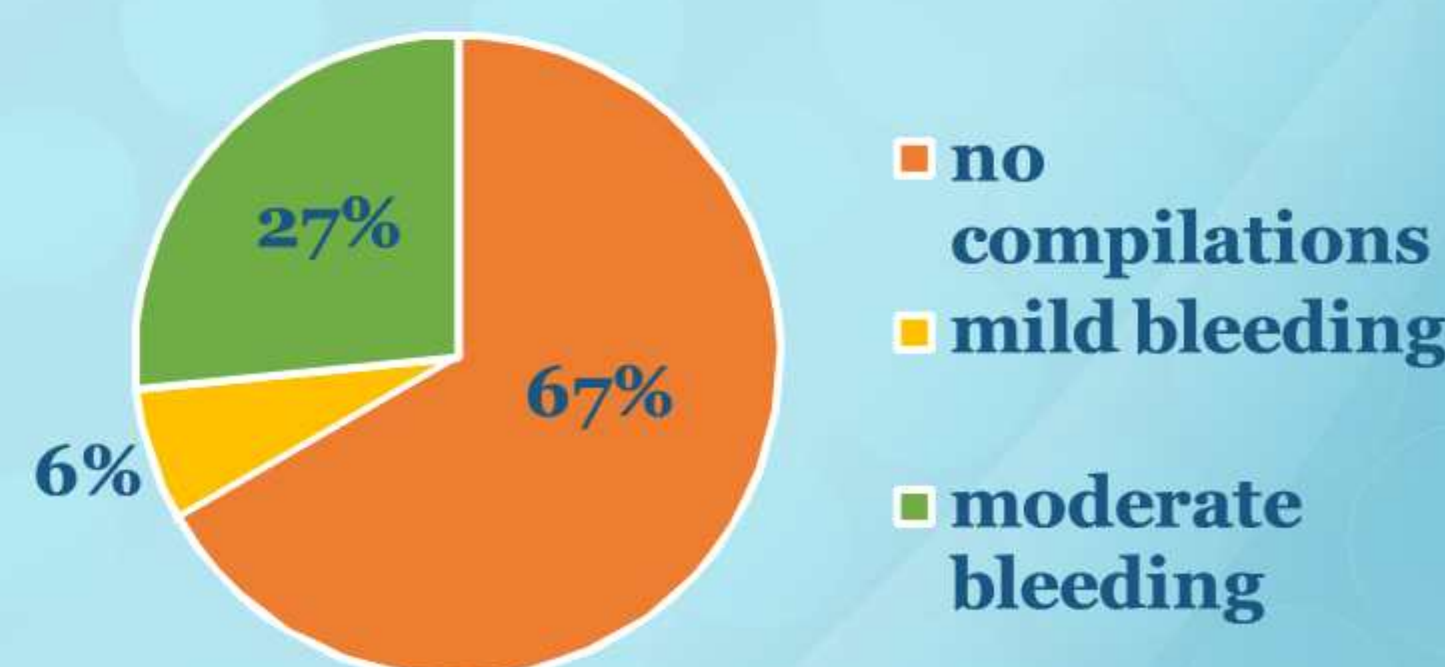


FIGURE 4.
Complications rate in peripheral lesions



CONCLUSIONS

BLCB represents a safer and promising technique with a great diagnostic yield in identification of central and peripheral lung lesions.

- ✓ Our study revealed the efficiency of cryobiopsy with an overall diagnostic yield of 94.6%.
 - ✓ The quality and quantity of the cryobiopsy samples optimize the histopathological diagnosis and provides subsequent molecular characterization of the sample
 - ✓ Minimal complications rate
- Limitations:
- ✓ Retrospective, single centre experience, with a relatively low number of patients
 - ✓ We could not make a definite conclusion about the appropriateness of transbronchial cryobiopsy in small peripheral lung lesions due to a low number of cases
 - ✓ We have not evaluated the diagnostic value of cryobiopsy based on the number and size of biopsies, and there is no evaluation based on the size and orientation of the pulmonary lesion. We performed cryobiopsy after forceps biopsy in some cases, which may have skewed our data towards an increased diagnostic value for cryobiopsy
 - ✓ We did not work according to a standardized protocol