Tab. 2. Histopathology results of the lung cancer

	Frequency (N)	Percentage (%)
Shape		
Irregular Margin	92	92
Regular Margin	8	8
Total	100	100
Associated Finding		
Collapse	5	5
Effusion	10	10
Effusion and Collapse	5	5
None	80	80
Total	100	100
Metastasis		
Adrenal	2	2
Bone	2	2
Brain	5	5
Brain and adrenal	1	1
Liver	3	3
Liver and adrenal	2	2
None	85	85
Total	100	100
Complication of biopsy		
None	100	100

Tab. 3. Association between the patients' sex and age and histopathology results.

Variables	Histopathology									P-value
	Second metastasis	Adeno CA	Benign	Carcinoid	Large CC	Small CC	Squamous CC	Undiagnosed	Total	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Sex										
Male	2(100.0)	28(70.0)	1(100.0)	2(100.0)	0(0.0)	9(64.3)	28(87.5)	5(62.5)	75(75.0)	
Female	0(0.0)	12(30.0)	0(0.0)	0(0.0)	1(100.0)	5(35.7)	4(12.5)	3(37.5)	25(25.0)	0.21
	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	
Age										
30 - 39	0(0.0)	2(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(3.1)	1(12.5)	4(4.0)	
40 - 49	0(0.0)	1(2.5)	0(0.0)	1(50.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(2.0)	
50 - 59	0(0.0)	12(30.0)	0(0.0)	0(0.0)	0(0.0)	3(21.4)	6(18.8)	2(25.0)	23(23.0)	
60 - 69	0(0.0)	9(22.5)	1(100.0)	0(0.0)	1(100.0)	5(35.7)	5(15.6)	1(12.5)	22(22.0)	0.56
70 - 79	2(100.0)	12(30.0)	0(0.0)	1(50.0)	0(0.0)	6(42.9)	15(46.9)	4(50.0)	40(40.0)	
80 - 89	0(0.0)	4(10.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	5(15.6)	0(0.0)	9(9.0)	
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	

Tab. 4. Association between histopathology results and lesions site, location, and size

Variables	Histopathology									P-value
	Second metastasis	Adeno CA	Benign	Carcinoid	Large CC	Small CC	Squamous CC	Undiagnosed	Total	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Site										
Lingula	0(0.0)	2(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(2.0)	
LLL	0(0.0)	5(12.5)	1(100.0)	0(0.0)	0(0.0)	4(28.6)	3(9.4)	4(50.0)	17(17.0)	
LUL	0(0.0)	10(25.0)	0(0.0)	0(0.0)	1(100.0)	5(35.7)	10(31.3)	2(25.0)	28(28.0)	
RLL	0(0.0)	10(25.0)	0(0.0)	2(100.0)	0(0.0)	1(7.1)	6(18.8)	0(0.0)	19(19.0)	
RML	0(0.0)	3(7.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(6.3)	0(0.0)	5(5.0)	0.46
RUL	2(100.0)	10(25.0)	0(0.0)	0(0.0)	0(0.0)	4(28.6)	10(31.3)	2(25.0)	28(28.0)	
RUL, LLL and RML	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(3.1)	0(0.0)	1(1.0)	
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	
Location										
Central	0(0.0)	14(35.0)	0(0.0)	2(100.0)	1(100.0)	9(64.3)	8(25.0)	3(37.5)	37(37.0)	
Peripheral	2(100.0)	26(65.0)	1(100.0)	0(0.0)	0(0.0)	5(35.7)	24(75.0)	5(62.5)	63(63.0)	0.041
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	
Lesion Size										
1 - 3 cm	0(0.0)	6(15.0)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	1(3.1)	3(37.5)	11(11.0)	
3 - 5 cm	2(100.0)	16(40.0)	1(100.0)	1(50.0)	0(0.0)	6(42.9)	10(31.3)	2(25.0)	38(38.0)	
> 5 cm	0(0.0)	18(45.0)	0(0.0)	1(50.0)	1(100.0)	7(50.0)	21(65.6)	3(37.5)	51(51.0)	0.24
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	

Tab. 5. Association between histopathology results and other studied results

Variables	Histopathology									P-value
	Second metastasis	Adeno CA	Benign	Carcinoid	Large CC	Small CC	Squamous CC	Undiagnosed	Total	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Associated Finding										
Collapse	0(0.0)	1(2.5)	0(0.0)	1(50.0)	0(0.0)	1(7.1)	2(6.3)	0(0.0)	5(5.0)	0.59
Effusion	0(0.0)	5(12.5)	0(0.0)	0(0.0)	0(0.0)	3(21.4)	2(6.3)	1(12.5)	11(11.0)	
Effusion and Collapse	0(0.0)	1(2.5)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	1(3.1)	1(12.5)	4(4.0)	
None	2(100.0)	33(82.5)	1(100.0)	1(50.0)	1(100.0)	9(64.3)	27(84.4)	6(75.0)	80(80.0)	
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	
Metastasis										
Adrenal	0(0.0)	1(2.5)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	0(0.0)	0(0.0)	2(2.0)	0.62
Bone	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(6.3)	0(0.0)	2(2.0)	
Brain	0(0.0)	3(7.5)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	1(3.1)	0(0.0)	5(5.0)	
Brain and adrenal	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(3.1)	0(0.0)	1(1.0)	
Liver	0(0.0)	2(5.0)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	0(0.0)	0(0.0)	3(3.0)	
Liver and adrenal	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(7.1)	0(0.0)	1(12.5)	2(2.0)	
None	2(100.0)	34(85.0)	1(100.0)	2(100.0)	1(100.0)	10(71.4)	28(87.5)	7(87.5)	85(85.0)	
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	
Shape										
Irregular Margin	2(100.0)	39(97.5)	0(0.0)	1(50.0)	1(100.0)	14(100.0)	30(93.8)	5(62.5)	92(92.0)	0.002
Regular Margin	0(0.0)	1(2.5)	1(100.0)	1(50.0)	0(0.0)	0(0.0)	2(6.3)	3(37.5)	8(8.0)	
Total	2(100.0)	40(100.0)	1(100.0)	2(100.0)	1(100.0)	14(100.0)	32(100.0)	8(100.0)	100(100.0)	

DISCUSSION

The results of our study indicated that adenocarcinoma and squamous cell carcinoma were observed in more than two-thirds and nearly two-thirds of the patients, respectively. Unlike this finding, Barclay et al (2019) reported increased incidence of subsequent lung, laryngeal, head and neck, and oesophageal squamous cell carcinoma for at least a decade from the first diagnosis among lung cancer survivors [16]. Moreover, Miller et al (2011) reported that adenocarcinoma of the lung usually evolves from the mucosal glands and represents about 40% of all lung cancers [17].

In the present study, three-fourths of the patients were a male, which shows a higher percentage of lung cancer in men than in women. In line with this finding of the present study, Hellyer et al (2019) reported that the chance that a 1 out of 16 men develop lung cancer in his lifetime, while the rate is around 1 in 17 women [18]. These figures are true for both smokers and non-smokers. They also stated that the risk was much higher among smokers [19]. In another similar study, Thandra et al (2021) reported that the age-standardized cumulative lifetime risk of developing lung cancer was 1.77% among women and 3.8% among men [20]. They also pointed out that developing nation in which cigarette smoking is most prevalent have the highest incidence of lung cancer, with over a 20-fold variation in incidence between regions.

According to the results of the current study, in nearly two-thirds of the cases, lung cancer was peripheral which was higher compared with the central ones. Similar to our study, Moon et al (2016) reported that the lung cancer type in the majority of the patients was peripheral rather than central [21]. The results of another study by Ock et al (2014) demonstrated that the preferential occurrence of the peripheral type of lung cancer was associated with the major histopathologic type of lung cancer, adenocarcinoma and unclassifiable non-small-cell lung cancer, and small-cell carcinoma [22].

More than 90% of the patient's lesion size was larger than 3 cm, considered lung masses. In a similar study, Gould et al (2013) reported that lesions larger than 3 cm in diameter are called lung masses and are usually considered malignant [8]. Their study suggests that the detection of lung masses on imaging studies is a significant finding that necessitates further evaluation to determine their nature as benign or malignant. As such, it is crucial to obtain an accurate diagnosis and provide prompt treatment to enhance outcomes for individuals with lung masses or other imaging findings that arouse suspicion [4].

In the present study, lung nodules had irregular margins in more than 90% of cases. In line with this finding, Gould et al (2013) reported that malignant lung cancer is five times more likely to be diagnosed for nodules that have ragged or spiculated margins, around twice as likely when pleural retraction is present, and 70% more likely when a vessel sign was present but only 10% more likely when margins were lobulated [8].

Based on the results of our study, effusion was observed in 10% of lung cancer patients. In a similar study by Hardavella et al (2020), over one-third of the cases with malignant pleural effusion were secondary to lung cancer [23]. They also observed pleural effusions in 15% of lung cancer patients at the time of diagnosis, which might rise to 50% over time. Our study further revealed that the most common areas for lung cancer to spread are the brain, liver, bone, and adrenal glands. This finding is in line with those reported by Popper (2016) who pointed out that lung cancer metastasizes to the adrenal glands, the liver, bones, the brain, and nearby lymph nodes or a single distant lymph node [24]. Based on the results of our study, there was a significant association between the location of lung cancer and the shape of lung nodules with the probability of malignancy. In line with the data achieved from the

present study, Heuvelmans et al (2017) reported that compared to benign baseline nodules, malignant nodules were larger and more often sub-solid, had more often a non-smooth margin, and were more often located in the upper lobes of the lung [25]. In another similar study conducted by Heidinger et al (2017), a malignancy prevalence rate of 2.3% to 6% was reported for nodules with a diameter of 5 mm to 9 mm, which is also in line with the present study's findings [26].

CONCLUSION

CT-guided biopsy of a lung lesion is safe and reliable, with a relatively low risk of complications and a high level of accuracy in diagnosing lung cancer. Lung cancer is more common in men than women and more peripheral than central. Irregular lung nodules have a higher risk of malignancy.

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