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ORIGINAL ARTICLE

Study of the added value of transthoracic ultrasound in staging of lung cancer

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KEYWORDS

Lung cancer;
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Abstract *Introduction:* Lung cancer is one of the leading causes of cancer-related deaths in the world and early detection and proper staging are highly important for planning of treatment strategy.

Aim of the work: To study the possible added value of transthoracic ultrasound (TUS) in staging of lung cancer.

Patients and methods: The study was carried out at Chest Department, Kasr El-Aini hospital in the period from April 2012 to December 2012. TUS was carried out on 50 cases with primary lung cancer after revision of CT chest images.

Results: TUS was only able to detect pulmonary masses in 31 cases (they had an ultrasound (US) window to reach the tumor mass). The study found that TUS was more able to detect more cases with chest wall invasion than CT chest and it was able to differentiate between visceral and parietal pleural invasion. It was also not only more able to detect the presence of pleural fluid encystation than CT scan detection but also was more able to further characterize its type. Diaphragmatic mobility was also assessed by TUS. There was also a statistical significant difference between TUS and CT chest in detecting consolidation and/or collapse.

Conclusion: TUS is complementary and adding a value to both clinical and computerized tomographic diagnoses of lung cancer. It can help in staging of lung cancer and aid chest physicians in determining the modality of treatment in each patient depending on his/her stage.

Introduction

Lung cancer is one of the leading causes of cancer-related deaths in the world. Invasion of the parietal pleura, the visceral pleura, or the bony structure of the chest wall occurs in 5–8% of patients with non-small cell lung cancer who are undergoing surgical treatment, and alters the TNM classification, staging, and planned treatment approaches. Therefore, it is important to determine the extent of disease prior to surgery, as this will impact disease management and prognosis [1].

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Table1 Clinical characteristic of the study population.

No.	Age (mean ± SD)	Sex		Diagnosis	
		Male	Female	NSCLC	SCLC
50	58.52 ± 9.19	43	7	46	4

Table2 Assessment of chest wall invasion, visceral pleural invasion and parietal pleural invasion.

Total cases	Chest wall invasion by CT		Chest wall invasion by US		Visceral pleural invasion by US		Parietal pleural invasion by US	
31	No.	%	No.	%	No.	%	No.	%
	5	16.1	9	29	17	54.8	14	45.1

Table 3 Presence of effect (collapse and consolidation) by US & CT.

Modality	Effect			No Effect	Total	*P*-Value
	Collapse	Consolidation	Collapse & consolidation			
CT	8	1	0	41	50	$P < 0.001$*
TUS	13	2	4	31		

* Significant at $P < 0.001$.

Table 4 Detection of pleural fluid encystations by CT and TUS.

Modality	Free effusion	Encysted effusion	*P*-Value
CT	12	4	0.013
TUS	5	11	

Table 5 Diaphragmatic mobility in relation to elevated copula by CT.

		Elevated copula By CT chest		
		Yes	No	Total
Diaphragm mobility by US	Mobile	6	39	45
	Immobile	1	4	5
	Total	7	43	50

Table 6 Comparison between clinical detection and US detection of supraclavicular lymph node.

Modality	LN present	LN absent	Total	*P*-Value
Clinical detection	2	48	50	0.008
US detection	5	45		