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Title: A computed tomography score to predict malignant pleural effusions

Dr. Silvia 14626 Bielsa silviabmartn@hotmail.com MD [1], Ms. Marina 14627 Pardina mapardina@ono.com MD [2], Mr. Antonio 14628 González axgonzalez.lleida.ics@gencat.cat MD [2] and Prof. Dr José Manuel 14629 Porcel jporcelp@yahoo.es MD [1]. [1] Pleural Diseases Unit, Internal Medicine, Arnau De Vilanova University Hospital, Lleida, Spain, 25198 and [2] Radiology, Arnau De Vilanova University Hospital, Lleida, Spain, 25198 .

Body: The computed tomographic (CT) appearance of malignant pleural effusions is varied. We aimed to assess whether a scoring system based on CT findings is useful to predict the likelihood of pleural malignancy. Methods This prospective study included 414 patients who underwent thoracentesis between 2008 and 2012. CT scans were reviewed by two radiologists who were blinded to the final diagnosis. Many CT features were evaluated, although a logistic regression model selected 8 findings which entered into a scoring system ranging from 0 to 20.

CT prediction score

CT findings	Odds ratio (95% IC)	Score	Kappa index
Pleural nodules >1cm	124 (11-1383)	5	0.81
Lung mass	18 (7-47)	3	0.83
Abdominal tumor	18 (5-64)	3	0.88
Lack of pericardial effusion	20 (1-296)	3	0.82
Lack of enlarged cardiac silhouette	13 (3-63)	2	0.64
Liver metastases	13 (3-52)	2	0.95
Lack of loculated pleural effusion	4 (2-8)	1	0.56
Volume of pleural effusion >1L	3 (2-7)	1	0.77

Results A score of 7 or higher was seen in 25 (11%) of 225 benign effusions and 96 (83%) of 115 malignant effusions confirmed cytohistologically, which yielded a positive likelihood ratio (LR) of 7.5 (95% CI 5.2-11). The validation group consisted of 41 benign and 33 malignant pleural effusions. Two of 41 (5%) and 30 of 33 (91%) of the benign and malignant pleural effusions had a 7 or higher score. A score of 7 or higher had a sensitivity of 91% (95% CI 76-97); specificity of 95% (95% CI 84-99); positive LR of 19 (95% CI 5-72) and

negative LR of 0.1 (95% CI 0.03-0.28) to identify malignant effusions. There was a substantial interobserver agreement concerning the identification of the radiological findings (Table). Conclusions A simple CT scoring system can reliably identify pleural malignancy.