Tapias Score for Predicting Recurrences in Resected Solitary Fibrous Tumor of the Pleura

Controversial Points and Future Perspectives Emerging From an External Validation

To the Editor:

Solitary fibrous tumor of the pleura (SFTP) is uncommon and has uncertain and unpredictable prognosis. Rarely attempted, the standardization of prognostic criteria has, so far, failed.[1,2] The effort from Tapias et al[3] recently reported in *CHEST* (January 2015) is, therefore, very welcome. By first proposing[4] and subsequently validating[3] a scoring system able to predict the recurrence after (radical) surgical resection for SFTP, they have provided a benchmark for discussion on the issue. Inspired by this, we have analyzed data from our multicentric malignant SFTP database,[5] testing the accuracy of the "Tapias score."

Among 50 male patients with SFTP, 43 were eligible.[3] The Tapias score (0–6) was as follows: n = 3, 2 points; n = 7, 3 points; n = 13, 4 points; n = 18, 5 points; and n = 2, 6 points. Tapias score = 0 was not recorded. With a cutoff ≥ 3,[3,4] 40 patients (93%) were labeled as high risk for recurrence, and three (7%) were labeled as low risk. The Cox regression analysis was reanalyzed, exploring the value of Tapias score in predicting recurrence or death (Table 1).

TABLE 1] Cox Regression Analysis of Time to Recurrence and Time to Death

Variable	HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
Time to recurrence				
Age	1.02 (0.97-1.71)	.43	…	…
Female sex	1.67 (0.58-4.84)	.34	…	…
Right side	0.77 (0.35-1.75)	.54	…	…
Chest wall invasion	4.34 (1.49-12.59)	.007[a]	6.31 (1.26-31.05)	.02[a]
Tumor size	1.04 (0.96-1.13)	.26	…	…
Pleural effusion	3.48 (1.1-11.00)	.03[a]	2.14 (0.46-9.46)	.31
Mytosis	0.97 (0.90-1.04)	.41	…	…
Necrosis	0.7 (0.16-0.3.38)	.69	…	…
England score	0.15 (0.68-11.2)	.69	…	…
Tapias score	1.99 (0.94-3.76)	.07[a]	1.06 (0.43-2.63)	.89
Tapias score ≥ 3	3.53 (0.92-13.5)	.06[a]	1.01 (0.18-5.76)	.98
Time to death				
Age	1.03 (0.98-1.1)	.21	…	…
Female sex	0.88 (0.25-3.1)	.85	…	…
Right side	0.93 (0.41-1.96)	.79	…	…
Completeness	0.04 (0.005-0.34)	.001[a]	0.06 (0.09-0.53)	.01[a]
Chest wall invasion	3.2 (0.80-12.86)	.10[a]	1.03 (0.27-3.98)	.96
Tumor size	1.07 (0.98-1.18)	.12	…	…
Pleural effusion	3.34 (0.82-13.6)	.09[a]	1.48 (0.33-6.5)	.60
Mytosis	0.91 (0.81-1.02)	.13	…	…
Necrosis	0.62 (0.14-0.3.15)	.62	…	…
England score	0.96 (0.43-2.1)	.93	…	…
Tapias score	1.23 (0.55-2.79)	.60	…	…
Tapias score ≥ 3	1.36 (0.27-6.84)	.70	1.01 (0.18-5.76)	.98

HR = hazard ratio.
[a]Significance at $P < .05$.

We registered at follow-up 12 recurrences (30%) in the high-risk group vs none in the low-risk group ($P = .06$), confirming the usefulness of the Tapias score as a predictor of recurrence. In addition, malignant pleural effusion and chest wall invasion significantly increased the risk of recurrence ($P = .03$ and .007, respectively). The completeness of resection was the only independent factor influencing the prognosis on multivariate analysis ($P = .01$).

What clearly emerges from this comparison is that the number of recurrences observed in the two clinical series (nine cases in the Tapias et al[3] study and 12 in our series) is too low to represent a robust basis for a score system analysis as suggested by the wide ranges in CIs in both analyses. Moreover, the population investigated in Tapias et al[3] was not completely representative of the biologic spectrum of such neoplasms, whereas 70% of all patients were low-risk subjects (relapse, 8%). More aggressive cases of SFTP were present in our study, with a higher percentage of recurrences (12 cases, 27.9%).

Consequently, we strongly believe that the Tapias score represents a remarkable step toward a better comprehension of such rare neoplasms and an excellent basis to further generate a more accurate score system analysis on larger and more homogeneous datasets of patients, with the number of recurrences as the principal determinant of the sample size. As well, we believe that other clinical features (eg, chest wall invasion, malignant pleural effusion) probably deserve more attention in prognostic stratification after radical surgery.

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FINANCIAL/NONFINANCIAL DISCLOSURES: The authors have reported to *CHEST* that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

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DOI: 10.1378/chest.14-2697

References

1. England DM, Hochholzer L, McCarthy MJ. Localized benign and malignant fibrous tumors of the pleura. A clinicopathologic review of 223 cases. *Am J Surg Pathol*. 1989;13(8):640-658.
2. de Perrot M, Fischer S, Bründler MA, Sekine Y, Keshavjee S. Solitary fibrous tumors of the pleura. *Ann Thorac Surg*. 2002;74(1):285-293.
3. Tapias LF, Mercier O, Ghigna MR, et al. Validation of a scoring system to predict recurrence of resected solitary fibrous tumors of the pleura. *Chest*. 2015;147(1):216-223.
4. Tapias LF, Mino-Kenudson M, Lee H, et al. Risk factor analysis for the recurrence of resected solitary fibrous tumours of the pleura: a 33-year experience and proposal for a scoring system. *Eur J Cardiothorac Surg*. 2013;44(1):111-117.
5. Lococo F, Cesario A, Cardillo G, et al. Malignant solitary fibrous tumors of the pleura: retrospective review of a multicenter series. *J Thorac Oncol*. 2012;7(11):1698-1706.

Response

To the Editor:

We sincerely thank Dr Lococo and colleagues for their comments on our recent article in *CHEST*[1] validating a scoring system to predict recurrence after complete resection of solitary fibrous tumors of the pleura (SFTPs). We commend the expeditious effort of applying the score to a multiinstitutional population of patients with resected "malignant" SFTPs.[2] The results appear to further support the scoring system as a useful clinical tool that outperformed historical criteria (ie, England's criteria), even when applied to a higher risk population harboring a malignant phenotype of SFTPs.

We agree with the authors' comment that the number of events in our study (ie, SFTP recurrences) is too low to represent a robust basis for a score-system analysis. However, the low incidence of this neoplasm[3] precludes the accumulation of large patient samples hampering prospective studies. Published literature consists mostly of single-institution retrospective case series, with no standardization of prognostic criteria. In spite of these limitations, it is our intention to provide a basis to organize the evaluation of oncologic outcomes of patients undergoing surgical treatment of SFTP. Including the population of Lococo et al,[2] the proposed scoring system has now been applied to three independent cohorts of patients accounting for a total of 215 subjects with SFTPs.[1,2,4] In all cases, it has performed well in terms of its capacity to classify patients according to their risk of SFTP recurrence after complete surgical resection.

We respectfully disagree with the statement that the population studied in the external validation cohort[1] does not represent all of the biologic spectrum of SFTP. While it is true that we excluded patients with multifocal and metastatic disease, incompletely resected SFTPs, and those medically unfit to undergo surgery, we included all patients treated at a reference surgical center. One would expect that this would capture most cases as they spontaneously occur in the hospital's area of influence.

Finally, we agree with the comment that other variables deserve more attention in the prognostic stratification of patients with SFTP. In concordance with their observation, in our score development cohort[4] we found that the presence of a pleural effusion, as well as a symptomatic presentation, and a Ki67 proliferation index > 10% were associated with SFTP recurrence on univariate analysis. Unfortunately, these variables could not be included in our regression models given the paucity of events and our small sample size. We believe that the predictive ability of the present score can be improved by incorporating additional clinical variables, but especially, molecular parameters, while analyzing larger multiinstitutional populations.

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FINANCIAL/NONFINANCIAL DISCLOSURES: The authors have reported to *CHEST* that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

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DOI: 10.1378/chest.14-2892

References

1. Tapias LF, Mercier O, Ghigna MR, et al. Validation of a scoring system to predict recurrence of resected solitary fibrous tumors of the pleura. *Chest*. 2015;147(1):216-223.
2. Lococo F, Cesario A, Cardillo G, et al. Malignant solitary fibrous tumors of the pleura: retrospective review of a multicenter series. *J Thorac Oncol*. 2012;7(11):1698-1706.
3. England DM, Hochholzer L, McCarthy MJ. Localized benign and malignant fibrous tumors of the pleura. A clinicopathologic review of 223 cases. *Am J Surg Pathol*. 1989;13(8):640-658.
4. Tapias LF, Mino-Kenudson M, Lee H, et al. Risk factor analysis for the recurrence of resected solitary fibrous tumours of the pleura: a 33-year experience and proposal for a scoring system. *Eur J Cardiothorac Surg*. 2013;44(1):111-117.